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**A Replication of a Randomized Controlled Trial on the Effects of a Meaning-Centered
Intervention on Meaning in Life, Eating Disorder Symptoms and Self-esteem in Young
Women with High Weight and Shape Concerns**

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Abstract

The purpose of this study was to replicate a previously conducted randomized controlled trial examining the effectiveness of a meaning-centered intervention on meaning in life and eating disorder symptoms in young women with high weight and shape concerns (Van Doornik et al., 2023). Moreover, the present study expanded upon the original study by examining the effect of the meaning-centered intervention on self-esteem. Participants filled in questionnaires measuring meaning in life, eating disorder symptoms, and self-esteem and were then allocated to either the intervention condition ($n = 58$) or the waitlist control condition ($n = 46$). The meaning-centered intervention consisted of six weekly one-hour online sessions that were carried out by a trainer. After completion of the intervention (or 6 weeks for the waitlist condition) participants filled in the same set of questionnaires. Results of ANCOVA and mixed ANOVA were in line with hypotheses such that (H1) meaning in life increased, (H2) eating disorder symptoms decreased, and (H3) self-esteem increased in response to the meaning-centered intervention as compared to the waitlist control. Findings of this study support the effectiveness of the meaning-centered intervention for young women with high weight and shape concerns, even under non-pandemic conditions.

Keywords: meaning-centered intervention, meaning in life, eating disorder symptoms, self-esteem, replication, randomized controlled trial

A Replication of a Randomized Controlled Trial on the Effects of a Meaning-Centered Intervention on Meaning in Life, Eating Disorder Symptoms and Self-esteem in Young Women with High Weight and Shape Concerns

Eating disorders are severe mental disorders that represent a significant public health concern (Swanson et al., 2011; Galmiche et al., 2019). Anorexia nervosa (AN), bulimia nervosa (BN), binge eating disorder (BED) and other specified eating and feeding disorder (OSFED) are among the most commonly diagnosed eating psychopathologies (American Psychiatric Association, 2013). All eating disorder diagnoses are associated with substantial distress, functional impairment, depression, suicidality, comorbidity, and low quality of life (Allen et al., 2013). As such, eating psychopathology is marked by high rates of morbidity and mortality (Crow et al., 2009; Arcelus et al., 2011) with a lifetime prevalence of 12% (Stice et al., 2013). The efficacy of eating disorder treatment is relatively limited, as only about 50% of patients recover fully in response to treatment (Steinhausen, 2009) and about 20% of patients develop chronic eating disorders (Dobrescu et al., 2020). Considering the severity of these disorders and the lack of effective treatment options, it is crucial to explore the factors involved in eating pathology to gain a better understanding of the underlying mechanisms.

Eating psychopathology is characterized by an over-evaluation of eating, shape, and weight and their control as well as strict dieting and other weight-control behaviors (Fairburn et al., 2003). Fairburn's (2003) transdiagnostic theory of eating disorders posits that dysfunctional self-evaluation, mood-intolerance, perfectionism, and low self-esteem play crucial roles in perpetuating eating pathology. Low self-esteem involves negative self-perception and entails a lack of self-worth and self-respect (Rosenberg, 1965). According to Fairburn et al. (2003), low self-esteem can lead to a sense of hopelessness or meaninglessness, thereby motivating the pursuit of valued domains (i.e., controlling eating, shape, and weight). In line with this viewpoint, the meaning making model of eating disorders (MMMED) suggests

that eating pathology may serve as a maladaptive way to cope with a lack of meaning in life (Marco et al., 2021). Furthermore, the MMMED identifies low self-esteem as a vulnerability factor within this framework. While definitions of meaning in life vary greatly in the literature, it involves e.g., living in line with personal values, experiencing a sense of purpose, and feeling that one's life is coherent and worth living (Martela & Steger, 2016). For individuals concerned about their weight and shape, eating disorder symptoms may temporarily provide a sense of purpose and meaning in life. However, over time, this preoccupation with controlling one's appearance and food hinders engagement with other important life domains such as relationships, self, and work (Mathews et al., 2012). Disengagement with these life domains (i.e., sources of meaning) can thereby lead to a diminished sense of meaning in life. Thus, according to the MMMED, a vicious cycle arises where eating psychopathology functions as a dysfunctional attempt to cope with low meaning in life, however, subsequently further eroding the sense of meaning in life (Marco et al., 2021; Fox & Leung, 2009). Based on pertinent theoretical frameworks, low meaning in life can be postulated as a risk factor for the development and maintenance of eating psychopathology, thereby contributing to low self-esteem.

As mentioned previously, low self-esteem is argued to play a role in eating psychopathology. Studies have demonstrated that low self-esteem acts as both a mediator and moderator in the relation between body dissatisfaction and eating disorders (Cruz et al., 2018; Rosewall et al., 2018, 2020). Longitudinal research findings further indicate that low self-esteem is related to eating disorder development (Steinhausen et al., 2005). In another study, comparisons between AN patients and restrained eaters revealed significantly higher levels of weight and shape concerns, as well as lower self-esteem in AN patients (Wilksch & Wade, 2004). Additionally, a study using an eating disorder sample has shown strong significant associations between laxative abuse and low self-esteem (Kovacs & Palmer, 2004). It seems

that self-esteem is closely linked to the weight and shape concerns in people with eating psychopathology. As such, Brockmeyer et al. (2013) reported lower levels of self-esteem in both acute and recovered AN patients compared to healthy controls. The same study demonstrated an increase in self-esteem with decreased body weight in patients, which has detrimental implications for recovery. Notably, low self-esteem appears to be particularly resistant to change, as evidenced by a study with recovered BN patients (Daley et al., 2008). Results showed that patients' low self-esteem persisted following recovery from BN. Furthermore, poor treatment response has been associated with low self-esteem (Fairburn et al., 1987). Thus, low self-esteem emerges as an important factor that may impede change and should be addressed in eating disorder treatment to ameliorate outcomes and recovery rates. Moreover, low self-esteem in the context of eating psychopathology may also pose a risk for low meaning in life.

Low self-esteem and meaning in life also appear to be linked to each other. In people with eating disorders, low self-esteem may be a risk factor for low meaning in life and vice versa (Marco et al., 2021; Fairburn et al., 2003). Several correlational studies have reported significant associations between meaning in life and self-esteem (Asagba et al., 2016; Barnett et al., 2019; Kim, 2013; Kang et al., 2009). In a recent investigation by Pelc and colleagues (2023), the relationship between low self-esteem and life satisfaction in the context of eating disorders was examined. Their findings indicated that low self-esteem and low life satisfaction were significant risk factors for eating psychopathology. Thus, it appears that low self-esteem and meaning in life, both of which play a role in eating psychopathology, exert mutual influence on each other.

Evidence from the existing literature suggests that low meaning in life may serve as a risk factor for eating psychopathology. Cross-sectional studies have demonstrated associations between meaning in life and body dissatisfaction, eating behaviors and negative food attitudes,

with meaning in life significantly predicting eating psychopathology (Góngora, 2014; Marco et al., 2019; Marco et al., 2017). Furthermore, significant associations between eating disorder symptoms and low life satisfaction have been found in a non-clinical sample (Mathews et al., 2012). Confirming this finding in a clinical sample, AN patients experienced lower satisfaction with normative life domains compared to the control group (Van Doornik et al., 2021). Moreover, longitudinal evidence suggests that satisfaction with normative life domains is a modifiable factor that varies with symptom severity in a clinical sample (Van Doornik et al., 2022). Similarly, Fox & Leung (2009) found lower levels of meaning in life, existential well-being, and life-satisfaction in AN patients compared to the control group. While most research has focused on AN, Marco et al. (2019) established negative correlations between meaning in life and a range of disordered eating behaviors across all eating disorder diagnoses (i.e., AN, BN, BED, OSFED). Likewise, another study found a multiple mediation effect between meaning in life and eating disorder symptomatology such as weight and shape concerns, body dissatisfaction, and negative attitude towards food (Marco et al., 2021). Additional evidence from longitudinal research implies that meaning in life may act as a protective factor in relation to eating disorder symptoms (Marco et al., 2020). Thus, low meaning in life emerges as an important risk factor for eating disorders, indicating that targeting meaning in life in eating disorder therapy should have a positive impact on reducing eating psychopathology.

The current study examined whether a meaning-centered intervention had a positive effect on meaning in life, eating disorder symptoms, and self-esteem in a sub-clinical sample. Specifically, this study aimed to replicate and extend a previously conducted randomized controlled trial examining the effects of a meaning-centered intervention on meaning in life and eating disorder symptoms in undergraduate women with high weight and shape concerns (Van Doornik et al., 2023). Van Doornik et al. (2023) found that the meaning-centered intervention led to large improvements in eating disorder symptoms and meaning in life as compared to the

control group. However, the study was conducted during COVID-19 restrictions which raised questions about unintentional biases and possible confounding factors related to the pandemic. It is possible that the results from Van Doornik et al. (2023) were inflated due to COVID-19 conditions. Therefore, it was crucial to replicate the study under non-pandemic circumstances. We particularly wanted to replicate and simultaneously extend the original research by also investigating the role of self-esteem. The research goal of the current study was to broaden the knowledge of meaning in life as a factor of eating disorders and interventions. The meaning-centered intervention utilized in this study is based on Breitbart et al. (2018) and Van der Spek et al. (2017) and comprises six weekly one-hour sessions that focus on increasing the participant's meaning in life. Participants in the current study were randomly allocated to either the experimental or control condition. Assessments took place before (T1) and after (T2) the intervention (or after 6 weeks for the waitlist condition). Based on the existing literature and previous findings of Van Doornik et al. (2023), it was hypothesized that the intervention would lead to (1) an increase in meaning in life, (2) a decrease in eating disorder symptoms, and (3) an increase in self-esteem, as compared to the waitlist control condition. Accordingly, the current study aimed to address the research question: To what extent does a meaning-centered intervention affect meaning in life, eating disorder symptoms, and self-esteem in young women with high weight and shape concerns?

Methods

Participants

Participants were undergraduate psychology students who identify as female. They were recruited through convenience sampling via the SONA first-year pool of the Rijksuniversiteit Groningen and reimbursed with course credits. A total of 468 participants were screened using the Weight Concern Scale (WCS; Killen et al., 1994). Among them, 180 participants who endorsed 'always' or 'very often' on the item 'Do you ever feel fat?' or scored

≥ 47 on the WCS, and who were not currently in ED treatment, were invited to participate in the study (Jacobi et al., 2004). For the sake of this study, the WCS items were adjusted in line with Jacobi et al. (2004) so that every item had the same weight (a maximum score of 20 per question) resulting in a total score range of 0-100. A total of 147 participants filled in the first assessment and were randomly allocated to a condition. However, 37 participants did not fill in the post assessment, leaving a total of 110 participants. Among them, 58 participants were assigned to the waitlist condition, and 52 participants were assigned to the intervention condition. Six participants from the intervention condition dropped out due to a high time burden and personal reasons, leading to a final sample size of $N = 104$ ($n = 58$, $n = 46$). The age of the participants ranged from 17 to 33 years ($M = 19.66$, $SD = 2.26$). Mean body mass index (BMI) ranged from 16.6 to 54.0 ($M = 23.9$, $SD = 4.9$). Among the participants, 43.3% reported Dutch as their first language ($n = 45$), 15.4% reported German as their first language ($n = 16$), 9.6% reported English as their first language ($n = 10$), 9.6% reported being 'bilingual' ($n = 10$), and 22.1% reported 'other' when asked about their mother tongue ($n = 23$; e.g., Romanian, Slovenian, or Greek).

Measures

Meaning in Life Questionnaire

The Meaning in Life Questionnaire (MLQ; Steger et al., 2006) is a ten-item scale which consists of two subscales measuring the presence (MLQ-P) and search for meaning in life (MLQ-S). For the purpose of this study, only the MLQ-P was used, which comprises five items measuring the presence of meaning. Example items are "My life has a clear sense of purpose" and "I understand my life's meaning". Responses are recorded on a 7-point Likert scale ranging from 1 (*absolutely untrue*) to 7 (*absolutely true*) and summed. Higher scores on this subscale indicate higher levels of meaning in life. The MLQ has good construct and

criterion validity (Brandstatter et al., 2012). In the current sample reliability was acceptable at T1 ($\alpha = .73$) and good at T2 ($\alpha = .85$).

Eating Disorder Examination Questionnaire

The Eating Disorder Examination Questionnaire (EDE-Q 6.0; Fairburn & Beglin, 2008) was used to assess eating disorder symptoms. This scale consists of 22 items and is divided into four subscales (Restraint, Eating Concern, Shape Concern, and Weight Concern). In this study, the global summed score of the EDE-Q 6.0. was used where a higher score indicates stronger eating disorder symptomatology. Questions assess eating disorder symptoms of the previous 28 days and responses are recorded on a 7-point Likert scale ranging from 0 (*no days/not at all*) to 6 (*every day/markedly*). Sample items include “Have you had a definite fear of losing control over eating?” and “Have you tried to exclude from your diet any foods that you like in order to influence your shape or weight (whether or not you have succeeded)?”. The current study showed excellent reliability at T1 ($\alpha = .92$) and at T2 ($\alpha = .95$).

Rosenberg Self-esteem Scale

The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1997) was used as a measure of self-esteem. Agreement to this ten-item scale is indicated on a 4-point Likert scale ranging from 1 (*strongly agree*) to 4 (*strongly disagree*). Sample items include “All in all, I am inclined to think that I am a failure” and “At times, I think I am no good at all”. For the sake of this study, positively phrased items were reverse coded such that higher summed scores indicate higher self-esteem. The concurrent, construct and predictive validity of the RSES were adequate (Rosenberg, 1997). Moreover, Rosenberg (1997) found excellent internal consistency for the RSES (Gutmann scale coefficient of reproducibility = .92). In the current study, reliability was good at T1 ($\alpha = .88$) and excellent at T2 ($\alpha = .95$).

Procedure

First, the study was approved by the ethics committee of the department of Behavioral and Social Sciences at the University of Groningen. Participants provided informed consent prior to completing the questionnaires. All assessments took place in an online unsupervised setting, via Qualtrics (<https://www.qualtrics.com>). Participants completed the WCS, and if eligible, they were asked to fill in the first assessment. Then, random allocation to the intervention or waitlist condition took place. Prior to each assessment participants received information regarding the study and answered demographic, weight, and height related questions. Both assessments (i.e., T1 and T2) took approximately 30 minutes to complete and comprised the same set of questionnaires. In total, there were eleven questionnaires, including, but not limited to, measures of meaning in life, general distress, eating disorder symptoms, and demographics.

Participants allocated to the intervention condition were invited to follow the online, meaning-centered intervention, which consisted of six sessions. These weekly, one-hour sessions were facilitated by trained master students. Intervention sessions were given in either English, Dutch, or German. After completion of the sessions (or after a six-week period for the waitlist control group), participants were asked to fill in the second assessment. Following this post assessment, participants assigned to the waitlist condition were given the opportunity to receive the meaning-centered intervention.

Meaning-Centered Intervention

The meaning-centered intervention utilized in this study was adapted from ‘Individual Meaning-Centered Psychotherapy for Patients with Advanced Cancer’ (Breitbart et al., 2015) and ‘Kanker en persoonlijke zingeving’ (Van der Spek et al., 2017) and specifically tailored to the target group (i.e., young women with weight and shape concerns). The intervention was structured and utilized a workbook for participants and a treatment manual for trainers. During the sessions, four sources of meaning were discussed: ‘personal life story’, ‘dealing

with life's limitations', 'creating your own life', and 'experiences'. The main goal of the intervention was to cultivate more meaning in life, with the prediction that it would lead to a decrease in weight and shape concerns. The sessions involved discussion on the theory of meaningfulness and its application by means of in-session and homework exercises provided in the workbook. The conversations emerging from the interpretative comments and questions of the trainer were an important part of the intervention. The trainer also helped to compose concrete goals and examples of meaning, to foster useful and lasting skills for the future.

Table 1 provides an overview of the sessions.

Table 1

Sessions covered in the meaning-centered intervention (MCI)

Session	Session Topic	Assignments	Homework
1	Introducing the MCI, theory linking meaning to weight and shape concerns, sources of meaning.	Defining meaning; meaningful experiences; video about meaning in life and eating disorders.	Writing down one meaningful experience every day.
2	Personal life story as a source of meaning: environmental influences.	Life lessons from positive and negative experiences; life lessons from memories linked to the emotions of regret, sadness, and joy; meaningful people in one's life; brainstorming: 'who am I?'	Making overview of positive and negative life experiences that marked one's life-story.
3	Personal life story as a source of meaning: personal influences.	Timeline of the past; future timeline.	Share personal life story (timelines). with a significant other.
4	Dealing with life's limitations as a source of meaning.	Experiencing current limitations and boundaries; what goes well and where is room for improvement regarding dealing with	Choose one goal and make a step-by-step plan; take action to achieve the goal.

		limitations; setting 5 short-term goals.	
5	Creating own life and experiences as sources of meaning.	Courage, responsibility, commitment experiences; meaningful life experiences.	Make an overview of things learned during this intervention; make steps towards the goal.
6	Reflecting on life lessons and things learned during MCI.	Presenting life lessons; reflecting on intervention.	

Note. MCI: meaning-centered intervention for women with weight and shape concerns.

Data analysis

The data were analyzed using the IBM SPSS Statistics version 28.0.1.1. As this was a replication study, we aimed for the same number of participants as in the original study. According to the a-priori power analysis conducted in the original study, a minimum of 128 participants was required. Accounting for an expected dropout rate of 15%, 140 female participants were needed to achieve a power of $\beta = 0.80$.

The analysis involved three separate Analyses of Covariances (ANCOVA) unless assumptions were violated. For all three variables, pre-test scores (T1) were used separately as the covariate, post-test scores (T2) as the dependent variable, and the condition functioned as the independent between-subjects factor. Assumptions for ANCOVA were checked, and with two exceptions, no violations were observed. Significant outliers were identified for the meaning in life and the self-esteem variables. Therefore, analyses were run both with and without outliers. The outliers did not influence the results as there was no difference between these analyses. Furthermore, the assumption of homogeneity was violated for the eating disorder symptom variable. To deal with this violation, a mixed ANOVA design was used instead of an ANCOVA. Assumptions for mixed ANOVA were not violated.

Results

Meaning in Life

After controlling for the covariate (MLQ T1), there was a statistically significant difference between the two conditions on the MLQ T2 scores, ($F(1,103) = 9.73, p = .002, \eta^2 = 0.09$) with a medium effect size. The covariate explained 44.5% of the variance at MLQ T2 ($F(1,103) = 81.06, p < .001, \eta^2 = .45$) with a large effect size. See table 2 for descriptive statistics.

Eating Disorder Symptoms

There was a large statistically significant interaction effect between condition and time, Wilks' Lambda = .84, ($F(2, 102) = 19.21, p < .001, \eta^2 = .16$), indicating that the effect of time on the EDE-Q varies depending on the condition with EDE-Q scores decreasing significantly across time for the experimental condition. There was a large statistically significant main effect of time ($F(1,103) = 39.66, p < .001, \eta^2 = .28$). There was no significant main effect of condition ($F(1,103) = 2.54, p = .11, \eta^2 = .02$). See table 2 for descriptive statistics.

Self-esteem

After controlling for the covariate (RSES T1), there was a statistically significant difference between the two conditions on the RSES T2 scores ($F(1,103) = 18.09, p < .001, \eta^2 = .15$) with a large effect size. The covariate (RSES T1) explained 59.6% of the variance at RSES T2 ($F(1,103) = 149.11, p < .001, \eta^2 = .60$) with a large effect size. See table 2 for descriptive statistics.

Table 2

Pre- and post-intervention means and standard deviations per condition

	Waitlist control condition ($n = 58$)		Experimental condition ($n = 46$)	
	<i>Mean (Standard Deviation)</i>		<i>Mean (Standard Deviation)</i>	
	Pre-intervention	Post-intervention	Pre-intervention	Post-intervention
MLQ	45.74 (7.47)	45.86 (8.85)	47.35 (7.07)	51.28 (8.91)**

EDE-Q	64.88 (24.76)	61.10 (28.29)	66.41 (20.83)	45.35 (23.22)*
RSES	24.76 (4.81)	25.12 (4.88)	25.95 (5.29)	28.39 (5.13)*

Note. Significant post-intervention differences between the conditions according to

ANCOVA/mixed ANOVA are flagged: * $p < .001$, ** $p < .01$.

Discussion

This study assessed the effectiveness of a meaning-centered intervention in improving meaning in life, eating disorder symptoms, and self-esteem in a non-clinical sample of young women with high weight and shape concerns. More specifically, this study aimed to replicate and extend a randomized controlled trial conducted by Van Doornik et al. (2023). It was hypothesized that the meaning-centered intervention would lead to (1) an increase in meaning in life, (2) a decrease in eating disorder symptoms, and (3) an increase in self-esteem, as compared to the control group condition. All results were in accordance with predictions.

In line with hypothesis 1, when accounting for pre-test scores, the meaning-centered intervention had a medium positive effect on meaning in life. There was a significant difference between the waitlist and intervention condition at post-assessment. This observed positive effect of the meaning-centered intervention on meaning in life among women with high weight and shape concerns aligns with findings of the original study (Van Doornik et al., 2023). Moreover, these findings are also in accordance with prior research investigating the efficacy of the meaning-centered intervention among advanced cancer patients and cancer survivors (Breitbart et al., 2018; Van der Spek et al., 2017).

Consistent with hypothesis 2, the meaning-centered intervention led to large improvements in eating disorder symptoms. At post-assessment, eating disorder symptoms were significantly lower in the intervention group compared to the waitlist control group. This positive effect of the meaning-centered intervention on eating disorder symptoms is in line with the original study (Van Doornik et al., 2023). Furthermore, this finding is consistent with

previous research showing that meaning in life is inversely related to eating disorder symptoms (Marco et al., 2019). The observed positive effect of the intervention on eating disorder symptoms supports the suggestion that adding a meaning component to eating disorder treatment as usual might be beneficial (Marco et al., 2020, Van Doornik et al., 2023).

In accordance with hypothesis 3, the meaning-centered intervention had a large positive effect on self-esteem. When controlling for covariance, self-esteem was significantly higher at post-assessment for the intervention group as compared to the control group. This positive effect of the meaning-centered intervention on self-esteem in women with high weight and shape concerns is in line with previous research suggesting that low self-esteem and low meaning in life are correlated and both pose a significant risk for eating psychopathology (Barnett et al., 2019; Pelc et al., 2023). Prior research showed that low self-esteem has been linked to poor treatment response and often persists in recovered patients (Fairburn et al., 1987, Daley et al., 2008). In this light, the positive impact of the meaning-centered intervention on self-esteem seems promising for eating disorder treatment.

The findings of this study carry theoretical implications regarding the role of meaning in life within the context of eating disorders and self-esteem. In support of the MMMED (Marco et al., 2021), our findings show that enhancing meaning in life leads to improvements in eating disorder symptoms. Thus, higher levels of meaning in life appear to reduce the risk of developing an eating disorder. In accordance with Fairburn's transdiagnostic model of eating disorders (2003) and Marco et al. (2021), our findings support the idea that low self-esteem is characteristic of eating pathology and linked to meaninglessness. More specifically, our findings imply that enhancing meaning in life contributes to improvements in self-esteem which holds promise with regards to eating disorder treatment (Mora et al., 2017; Pel et al., 2023).

Based on our study, several practical implications can be considered. The positive effect of the meaning-centered intervention in increasing meaning in life while reducing eating

disorder symptoms and improving self-esteem has promising implications for eating disorder treatment. The intervention should therefore be tested in a sample of eating disorder patients adding the meaning-centered treatment to the treatment as usual and comparing to an active control group (Van Doornik et al., 2023). Moreover, the findings of the current study are also promising with regards to eating disorder prevention (Stice et al., 2013). Though promising, little is yet known about the exact working mechanisms of the meaning-centered intervention. Future research should therefore investigate which parts of the meaning-centered intervention are the most effective. Finally, in the light of its positive effect on self-esteem, the meaning-centered intervention may also be effective for other forms of psychopathology (e.g., depression, anxiety) that are associated with low self-esteem (Aboalshamat et al., 2017).

The current study had a reasonably large sample size and tested the meaning-centered intervention by using a randomized controlled trial design. Nevertheless, several limitations should be acknowledged. Firstly, the present study had a smaller sample size than that required in the a-priori power analysis of the original study. However, a post-hoc power analysis using G*Power 3.1.9.4 showed that the current sample size still achieved sufficient power ranging from 0.89 for meaning in life to 0.99 for eating disorder symptoms and self-esteem. One limiting aspect of our study was that participants were asked to report their weight prior to the rest of the assessment, possibly leading to a priming effect that could have influenced outcome measure scores. As there is no data on the long-term effects of the intervention, future longitudinal research is needed to assess whether the observed positive effects of the meaning-centered intervention also hold over time. Furthermore, the sample of this study consisted of female psychology students which limits generalizations to other gender identities or more diverse groups. Nevertheless, the use of a subclinical sample is still of importance in the light of eating disorder prevention. Additionally, the fact that the meaning-centered intervention was also effective when administered by trained master students shows that it is feasible as a peer

intervention. This peer feasibility as well as the online setting enhance the accessibility of the meaning-centered intervention. Lastly, it is important to note that participants provided very positive feedback regarding the intervention.

To recapitulate, the current study successfully replicated and expanded upon a randomized controlled trial by Van Doornik (2023) which investigated the effectiveness of a meaning-centered intervention on meaning in life and eating disorders in young women with high weight and shape concerns. Findings aligned with hypotheses, demonstrating that the meaning-centered intervention was effective in increasing meaning in life and decreasing eating disorder symptoms when compared to the waitlist control group. Additionally, the intervention also led to increased self-esteem compared to the waitlist condition. These results provide promising evidence for the effectiveness of the meaning-centered intervention for young women with high weight and shape concerns. Future research is warranted to test the efficacy of the meaning-centered intervention on individuals diagnosed with eating disorders.

References

- Aboalshamat, K., Jawhari, A., Alotibi, S., Alzahrani, K., Al-Mohimeed, H., Alzahrani, M., & Rashedi, H. (2017). Relationship of self-esteem with depression, anxiety, and stress among dental and medical students in Jeddah, Saudi Arabia. *Journal of International Medicine Dentistry*, 4(2), 61-68. <https://doi.org/10.18320/JIMD/201704.0261>
- Allen, K. L., Byrne, S. M., Oddy, W. H., & Crosby, R. D. (2013). DSM-IV-TR and DSM-5 eating disorders in adolescents: Prevalence, stability, and psychosocial correlates in a population-based sample of male and female adolescents. *Journal of Abnormal Psychology*, 122(3), 720-732. <https://doi.org/10.1037/a0034004>
- American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders: DSM-5* (5th ed.). Washington, DC: American psychiatric association.
- Arcelus, J., Mitchell, A. J., Wales, J., & Nielsen, S. (2011). Mortality rates in patients with anorexia nervosa and other eating disorders: A meta-analysis of 36 studies. *Archives of General Psychiatry*, 68(7), 724-731. <https://doi.org/10.1001/archgenpsychiatry.2011.74>
- Asagba, R. B., Agberotimi, S. F., & Wimberly, C. (2016). Meaning in life and life orientation as predictors of self-esteem among first-year undergraduate students of a Nigerian university. *International Journal of Educational Policy and Planning*, 6, 1-11.
- Barnett, M. D., Moore, J. M., & Garza, C. J. (2019). Meaning in life and self-esteem help hospice nurses withstand prolonged exposure to death. *Journal of Nursing Management*, 27(4), 775-780. <https://doi.org/10.1111/jonm.12737>
- Brandstätter, M., Baumann, U., Borasio, G. D., & Fegg, M. J. (2012). Systematic review of meaning in life assessment instruments. *Psycho-Oncology*, 21(10), 1034-1052. <https://doi.org/10.1002/pon.2113>

- Breitbart, W., Pessin, H., Rosenfeld, B., Applebaum, A. J., Lichtenthal, W. G., Li, Y., ... & Fenn, N. (2018). Individual meaning-centered psychotherapy for the treatment of psychological and existential distress: A randomized controlled trial in patients with advanced cancer. *Cancer, 124*(15), 3231-3239. <https://doi.org/10.1002/cncr.31539>
- Breitbart, W., Rosenfeld, B., Pessin, H., Applebaum, A., Kulikowski, J., & Lichtenthal, W. G. (2015). Meaning-centered group psychotherapy: an effective intervention for improving psychological well-being in patients with advanced cancer. *Journal of Clinical Oncology, 33*(7), 749. <https://doi.org/10.1200/JCO.2014.57.2198>
- Brockmeyer, T., Holtforth, M. G., Bents, H., Kämmerer, A., Herzog, W., & Friederich, H. C. (2013). The thinner the better: Self-esteem and low body weight in anorexia nervosa. *Clinical Psychology & Psychotherapy, 20*(5), 394–400. <https://doi.org/10.1002/cpp.1771>
- Crow, S. J., Peterson, C. B., Swanson, S. A., Raymond, N. C., Specker, S., Eckert, E. D., & Mitchell, J. E. (2009). Increased mortality in bulimia nervosa and other eating disorders. *American Journal of Psychiatry, 166*(12), 1342-1346. <https://doi.org/10.1176/appi.ajp.2009.09020247>
- Cruz-Sáez, S., Pascual, A., Włodarczyk, A., & Echeburúa, E. (2018). The effect of body dissatisfaction on disordered eating: The mediating role of self-esteem and negative affect in male and female adolescents. *Journal of Health Psychology, 25*(8), 1098-1108. <https://doi.org/10.1177/1359105317748734>
- Daley, K. A., Jimerson, D. C., Heatherton, T. F., Metzger, E. D., & Wolfe, B. E. (2008). State self-esteem ratings in women with bulimia nervosa and bulimia nervosa in remission. *International Journal of Eating Disorders, 41*(2), 159–163. <https://doi.org/10.1002/eat.20447>

- Dias, J. C. R., da Silva, W. R., Maroco, J., & Campos, J. A. D. B. (2015). Validation of the weight concerns scale applied to Brazilian university students. *Body Image, 14*, 72-76. <http://dx.doi.org/10.1016/j.bodyim.2015.03.012>
- Dobrescu, S. R., Dinkler, L., Gillberg, C., Råstam, M., Gillberg, C., & Wentz, E. (2020). Anorexia nervosa: 30-year outcome. *The British Journal of Psychiatry, 216*(2), 97-104. <https://doi.org/10.1192/bjp.2019.113>
- Fairburn, C. G., Cooper, Z., & Shafran, R. (2003). Cognitive behaviour therapy for eating disorders: A “transdiagnostic” theory and treatment. *Behaviour Research and Therapy, 41*(5), 509-528. [https://doi.org/10.1016/S0005-7967\(02\)00088-8](https://doi.org/10.1016/S0005-7967(02)00088-8)
- Fairburn, C. G., Kirk, J., O'Connor, M. E., Anastasiades, P., & Cooper, P. J. (1987). Prognostic factors in bulimia nervosa. *British Journal of Clinical Psychology, 26*, 223–224. <https://doi.org/10.1111/j.2044-8260.1987.tb01349.x>
- Fox, A. P., & Leung, N. (2009). Existential well-being in younger and older people with anorexia nervosa: A preliminary investigation. *European Eating Disorders Review, 17*, 24–30. <https://doi.org/10.1002/erv.895>
- Frankl, V. E. (1959). The spiritual dimension in existential analysis and logotherapy. *Journal of Individual Psychology, 15*(2), 157.
- Galmiche, M., Déchelotte, P., Lambert, G., & Tavolacci, M. P. (2019). Prevalence of eating disorders over the 2000–2018 period: A systematic literature review. *The American Journal of Clinical Nutrition, 109*(5), 1402-1413. <https://doi.org/10.1093/ajcn/nqy342>
- Góngora, V. C. (2014). Satisfaction with life, well-being, and meaning in life as protective factors of eating disorder symptoms and body dissatisfaction in adolescents. *Eating Disorders, 22*(5), 435-449. <https://doi.org/10.1080/10640266.2014.931765>

- Kang, K. A., Kim, S. J., & Song, M. K. (2009). Relationship of self-esteem, meaning in life, and spiritual well-being in middle school students. *Child Health Nursing Research, 15*(4), 343-349. <https://doi.org/10.4094/jkachn.2009.15.4.343>
- Kim, C. G. (2013). Effects of perceived death and self-esteem on meaning in life among university students. *Journal of Korean Public Health Nursing, 27*(3), 539-550.
- Kovacs, D., & Palmer, R. L. (2004). The associations between laxative abuse and other symptoms among adults with anorexia nervosa. *International Journal of Eating Disorders, 36*(2), 224-228. <https://doi.org/10.1002/eat.20024>
- Marco, J. H., Cañabate, M., Llorca, G., & Pérez, S. (2020). Meaning in life moderates hopelessness, suicide ideation, and borderline psychopathology in participants with eating disorders: A longitudinal study. *Clinical Psychology and Psychotherapy, 27*(2), 146-158. <https://doi.org/10.1002/eat.10273>
- Marco, J. H., Cañabate, M., Martínez, C., Baños, R. M., Guillen, V., & Perez, S. (2021). Meaning in life mediates between emotional deregulation and eating disorders psychopathology: A research from the meaning-making model of eating disorders. *Frontiers in Psychology, 12*, 635-742. <https://doi.org/10.3389/fpsyg.2021.635742>
- Marco, J. H., Cañabate, M., & Pérez, S. (2019). Meaning in life is associated with the psychopathology of eating disorders: Differences depending on the diagnosis. *Eating Disorders, (in press), 27*, 550–564. <https://doi.org/10.1080/10640266.2018.1560852>
- Marco, J. H., Cañabate, M., Pérez, S., Guillén, V., Botella, C., & Baños, R. (2021). The meaning making model of eating disorders (MESTA): A preliminary analysis of the model. *Psicología Conductual, 29*(1), 5-28. <https://doi.org/10.51668/bp.8321101n>
- Marco, J. H., Cañabate, M., Pérez, S., & Llorca, G. (2017). Associations among meaning in life, body image, psychopathology, and suicide ideation in Spanish participants with

- eating disorders. *Journal of Clinical Psychology*, 73(12), 1768-1781.
<https://doi.org/10.1002/jclp.22481>
- Martela, F., & Steger, M. F. (2016). The three meanings of meaning in life: Distinguishing coherence, purpose, and significance. *The Journal of Positive Psychology*, 11(5), 531-545. <https://doi.org/10.1080/17439760.2015.1137623>
- Matthews, M., Zullig, K. J., Ward, R. M., Horn, T., & Huebner, E. S. (2012). An analysis of specific life satisfaction domains and disordered eating among college students. *Social Indicators Research*, 107, 55-69. <https://doi.org/10.1007/s11205-011-9826-5>
- Mora, F., Rojo, S. F., Banzo, C., & Quintero, J. (2017). The impact of self-esteem on eating disorders. *European Psychiatry*, 41(1), 558-558.
<https://doi.org/10.1016/j.eurpsy.2017.01.802>
- Pelc, A., Winiarska, M., Polak-Szczybyło, E., Godula, J., & Stępień, A. E. (2023). Low self-esteem and life satisfaction as a significant risk factor for eating disorders among adolescents. *Nutrients*, 15(7), 1603. <https://doi.org/10.3390/nu15071603>
- Rosenberg, M. (1965). *Society and the adolescent self-image*. Princeton university press.
- Rosewall, J. K., Gleaves, D. H., & Latner, J. D. (2018). An examination of risk factors that moderate the body dissatisfaction-eating pathology relationship among New Zealand adolescent girls. *Journal of eating disorders*, 6(1), 1-10.
<https://doi.org/10.1186/s40337-018-0225-z>
- Rosewall, J. K., Gleaves, D. H., & Latner, J. D. (2020). Moderators of the relationship between body dissatisfaction and eating pathology in preadolescent girls. *The Journal of Early Adolescence*, 40(3), 328-353. <https://doi.org/10.1177/0272431619837385>
- Schulenberg, S. E., & Melton, A. M. (2010). A confirmatory factor-analytic evaluation of the purpose in life test: Preliminary psychometric support for a replicable two-factor

- model. *Journal Of Happiness Studies*, *11*(1), 95–111. <https://doi.org/10.1007/s10902-008-91243>
- Steinhausen, H. C. (2009). Outcome of eating disorders. *Child and Adolescent Psychiatric Clinics of North America*, *18*(1), 225-242. <https://doi.org/10.1016/j.chc.2008.07.013>
- Steinhausen, H. C., Gavez, S., & Winkler Metzke, C. (2005). Psychosocial correlates, outcome, and stability of abnormal adolescent eating behavior in community samples of young people. *International Journal of Eating Disorders*, *37*(2), 119-126. <https://doi.org/10.1002/eat.20077>
- Surgenor, L. J., Maguire, S., Russell, J., & Touyz, S. (2007). Self-liking and self-competence relationship to symptoms of anorexia nervosa. *European Eating Disorders Review*, *15*(2), 139–145. <https://doi.org/10.1002/erv.734>
- Swanson, S. A., Crow, S. J., Le Grange, D., Swendsen, J., & Merikangas, K. R. (2011). Prevalence and correlates of eating disorders in adolescents: Results from the national comorbidity survey replication adolescent supplement. *Archives of General Psychiatry*, *68*, 714–723. <https://doi.org/10.1001/archgenpsychiatry.2011.22>
- Van der Spek, N., Vos, J., Van Uden-Kraan, C. F., Breitbart, W., Cuijpers, P., Holtmaat, K., ... & Verdonck-de Leeuw, I. M. (2017). Efficacy of meaning-centered group psychotherapy for cancer survivors: A randomized controlled trial. *Psychological Medicine*, *47*(11), 1990-2001. <https://doi.org/10.1017/S0033291717000447>
- Van Doornik, S. F. W., Glashouwer, K. A., Ostafin, B. D., de Jong, P. J. (2023). The effects of a meaning-centered intervention on meaning in life and eating disorder symptoms in undergraduate women with high weight and shape concerns: A randomized controlled trial. *Behavior Therapy*. <https://doi.org/10.1016/j.beth.2023.05.012>
- Van Doornik, S. F. W., Ostafin, B. D., Jonker, N. C., Glashouwer, K. A., & De Jong, P. J. (2021). Low satisfaction with normative life goals in adolescents with anorexia

nervosa. *Clinical Psychology and Psychotherapy*, 28(5), 1266–1274.

<https://doi.org/10.1002/cpp.2574>

Van Doornik, S. F., Ostafin, B. D., Jonker, N. C., Glashouwer, K. A., & de Jong, P. J. (2022).

Satisfaction with normative life domains and the course of anorexia nervosa. *International Journal of Eating Disorders*, 55(4), 553-563.

<https://doi.org/10.1002/eat.23691>

Wilksch, S., & Wade, T. D. (2004). Differences between women with anorexia nervosa and restrained eaters on shape and weight concerns, self-esteem, and depression. *International Journal of Eating Disorders*, 35(4), 571-578.

<https://doi.org/10.1002/eat.10273>

