The effect of a meaning in life intervention in reducing weight and shape concerns and depressive symptoms in female undergraduates

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Master Thesis – Clinical Psychology

S3932877

February, 2024

Clinical Psychology

University of Groningen

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Abstract

Van Doornik et al.'s (2023) findings showed that Meaning-Centered Psychotherapy for Eating Disorders (MCP-ED) could increase meaning in life (MiL) and decrease weight and shape concerns in female undergraduates under pandemic circumstances. The current study is a replication of van Doornik and colleagues' (2023) findings to confirm the robustness of their found effect in first-year psychology students (M age = 19.66, SD = 2.27) under non-pandemic circumstances. This is motivated by the recognition that the COVID-19 pandemic could have resulted in an overestimation of the treatment effect. Hypotheses: MCP-ED increases MiL, decreases weight and shape concerns and depressive symptoms in female undergraduates. We conducted a RCT (N = 104), where we compared the intervention condition (n = 46) versus a waitlist control condition (n = 58). The participants in the intervention condition received six sessions of MCP-ED aimed at increasing MiL. The Meaning in Life Questionnaire was used to assess MiL, the Eating Disorder Examination Questionnaire 6.0 was used to measure eating disorder symptoms, and the Depression subscale from the Depression, Anxiety, and Stress Scales was used to assess depressive symptoms. Results showed that MCP-ED increases MiL, decreases eating disorder symptoms and depressive symptoms. Future research should investigate if incorporating a MCP-ED component into existing psychotherapies for eating psychopathology is beneficial.

Keywords: Meaning in life, eating disorder symptoms, weight and shape concerns, depressive symptoms

The effect of a meaning in life intervention in reducing weight and shape concerns and depressive symptoms in female undergraduates

Eating disorders represent incapacitating mental illnesses that significantly impede daily functioning, thereby diminishing the quality of life for both affected patients and their caregivers (Hoeken & Hoek, 2020). It has been established in earlier research that weight- and shape concerns are related to eating disorder symptoms (Fairburn 2003; Tabri et al., 2015). These concerns encompass an individual's preoccupation with shape and weight (Tabri et al., 2015) and involve elements including feelings of fatness. The transdiagnostic cognitive-behavioral model of eating disorders (Fairburn et al., 2003; Fairburn, 2008) posits that an emphasis on shape and weight perpetuates the persistence of eating disorder symptoms and behaviors.

One of the many factors that are related to this excessive concern with weight and shape, is the experience of low meaning in life (MiL; Gongora, 2014; Brassai et al., 2015; Marco et al., 2017; Marco et al., 2019). A meaningful life can be defined as (a) one that is being guided by an individual's goals (purpose), (b) one that matters or possesses significance (mattering), and (c) one that makes sense to the person living it (comprehension; Baumeister & Vohs, 2002; George & Park, 2016). Studies have indicated that eating disorder patients experience less meaning in life (Marco et al., 2017) in the long term. In the short term, however, the effects of eating disorder symptoms can lead to temporary psychological benefits, such as the perceived control over weight and shape, providing short-term enhancement of self-worth, structure, and identity (Serpell et al., 1999). In the long term, these debilitating symptoms impede goal attainment in other meaningful areas of life (Hay & Touyz, 2015), lowering the experienced meaning in life. Conversely, those who experience greater MiL are better equipped to handle life's challenges (Marco et al., 2019), suggesting a potential preventative role of MiL against eating disorder symptoms.

Given the negative correlation between MiL and eating disorder symptoms, it could be beneficial to explore how treatment targeting the reduction of eating disorder symptoms could integrate a MiL component. Although Cognitive Behavioral Therapy-Enhanced (CBT-E; Fairburn, 2008) is the prevailing treatment for eating disorders, its universal efficacy is not guaranteed (Keel et al., 2005; Berends et al., 2018). Adding a MiL-enhancing-focused component to the present psychotherapies for eating disorders may be advantageous (Hay & Touyz, 2015; Marco et al., 2019; Van Doornik et al., 2021). According to Williamson et al. (2004) treatment objectives should involve diminishing overinvolvement with eating disorder goals and increasing engagement with valued life goals. This approach would lower the incentive value of objectives associated with eating disorders, facilitating a redirection of attention to more adaptive sources of MiL (Cox et al., 2015).

In an attempt to incorporate a MiL-enhancing intervention for treating eating disorder symptoms, a novel therapeutic protocol for Meaning-Centered Psychotherapy (MCP-ED) was created by Van Doornik and colleagues (2023), which was shown to be effective in female undergraduates with high shape and weight concerns. This protocol was adapted and based on MCP manuals by Breitbart and colleagues (2018), intended to decrease weight and shape concerns in females. They tested the efficacy of MCP-ED in an online six-week intervention on first-year female psychology students with high weight and shape concerns during the COVID-19 pandemic. Random assignment allocated participants to either the experimental condition, wherein they underwent six individual sessions of MCP-ED, or the waitlist control condition. Compared to baseline measures, individuals in the experimental condition showed a stronger increase in meaning, and a stronger decrease in eating disorder symptoms compared to the waitlist control condition, at post-assessment and four-week follow-up.

Additionally, beyond its potential efficacy in addressing weight and shape concerns, MCP-ED might also be effective in diminishing depressive symptoms, a prevalent

comorbidity in eating disorders. Major depressive disorder (MDD) is estimated to afflict 18-50% of individuals with eating disorders (Blinder et al., 2006; Hudson et al., 2007). Keshishian and colleagues (2021) posit that MDD may have a role in perpetuating eating disorder symptoms. For instance, depressive symptoms in anorexia nervosa may exacerbate social isolation or lack of desire to make changes in one's life. Thus, addressing MDD symptoms may be needed to take into account when trying to reduce weight and shape concerns. Moreover, individuals with higher levels of depressive symptoms experience life as less meaningful (Remmers et al., 2023) and conversely, those who find great meaning in their lives tend to have fewer symptoms of depression (Disabato et al., 2016). Consequently, MCP may hold promise in ameliorating depressive symptoms.

The current study

In light of the potential benefits of MiL in lowering eating disorder symptoms and depressive symptoms, our study has a main objective to replicate the findings of Van Doornik and colleagues (2023) under non-pandemic circumstances. Their data was gathered during the COVID-19 pandemic lockdown conditions, which may have influenced the impact of the treatment. It is possible that participants felt much more miserable than usual (Jaiswal et al., 2020; Mukhtar, 2020) because, for example, they were not permitted to attend university or see their friends and family during the data-collection period. In this way, they may have benefited from MCP-ED even more than they would have in the absence of pandemic worries and limitations since their human interactions were restricted (van Doornik et al., 2023). Talking to a therapist during MCP-ED online could have given these individuals a part of their missing human interaction (Li & Glecia, 2023), making the benefits of MCP-ED more pronounced. Consequently, the impact of the intervention of Van Doornik and colleagues (2023) could be an overestimation. Importantly, our present results address this limitation by looking into the robustness of these effects in the non-pandemic context. We intend to

investigate whether the MiL-intervention, MCP-ED, increases MiL, and decreases eating disorder symptoms and depressive symptoms in female undergraduates with high weight and shape concerns. We have chosen this sample since being a woman is a risk factor for developing eating pathology and college women are associated with eating pathology (Piran et al., 2007). Moreover, since were are using a subclinical sample, vulnerable eating disorder individuals are not being strained with a possible ineffective intervention. Moreover, it could give us insight into the possible preventive effect of MCP-ED which could reduce the likelihood of progression to clinical eating psychopathology (Stice et al., 2013). In this way, we hope to gain insight into whether the effects of the MCP-ED intervention remain robust under non-pandemic circumstances. The hypotheses for this study are:

Hypothesis 1. MCP-ED will increase meaning in life in female undergraduates post-intervention.

Hypothesis 2. MCP-ED will decrease eating disorder symptoms in female undergraduates post-intervention.

Hypothesis 3. MCP-ED will decrease depressive symptoms in female undergraduates post-intervention.

Methods

Participants

The study protocol of the present study was approved by the Ethical Committee of Psychology of the University of Groningen.

The sample of this study consisted of 104 first-year female psychology students (*M* age = 19.66, *SD* = 2.27) who study in the Netherlands. The majority of participants indicated Dutch (*n* = 45, 43.3%) or German (*n* = 16, 15.4%) as their mother tongue. The remaining participants identified as bilingual (*n* = 10, 9.6%) or filled in 'other' (*n* = 23, 22.1), which included languages such as Romanian, Slovak, and more. The mean Body Mass Index (BMI),

calculated using self-reported height and weight (kg/m^2), for the overall sample ($M = 23.88$, $SD = 4.90$) fell within the range of healthy body weight (Expert Panel on the Identification, Evaluation, and Treatment of Overweight in Adults, 1998). However, four individuals were classified as being underweight, 19 individuals were overweight, five individuals had obesity class I, one individual had obesity class II, and two individuals had obesity class III.

The participants were approached through the online SONA platform that allows psychology students to earn credits by participating in psychology research. Participants were asked to fill in an online questionnaire in Qualtrics. No monetary compensation was offered to participants.

Participants first completed an online screening using the Weight Concern Scale (WCS; Killen et al., 1994). Individuals scoring ≥ 47 or answering 'Often' or 'Always' to the question 'Do you ever feel fat?', indicative of high shape and weight concerns (Jacobi et al., 2004), were invited to participate in the study. Individuals currently in treatment for an eating disorder or who indicated not being fluent in Dutch, English, or German were excluded.
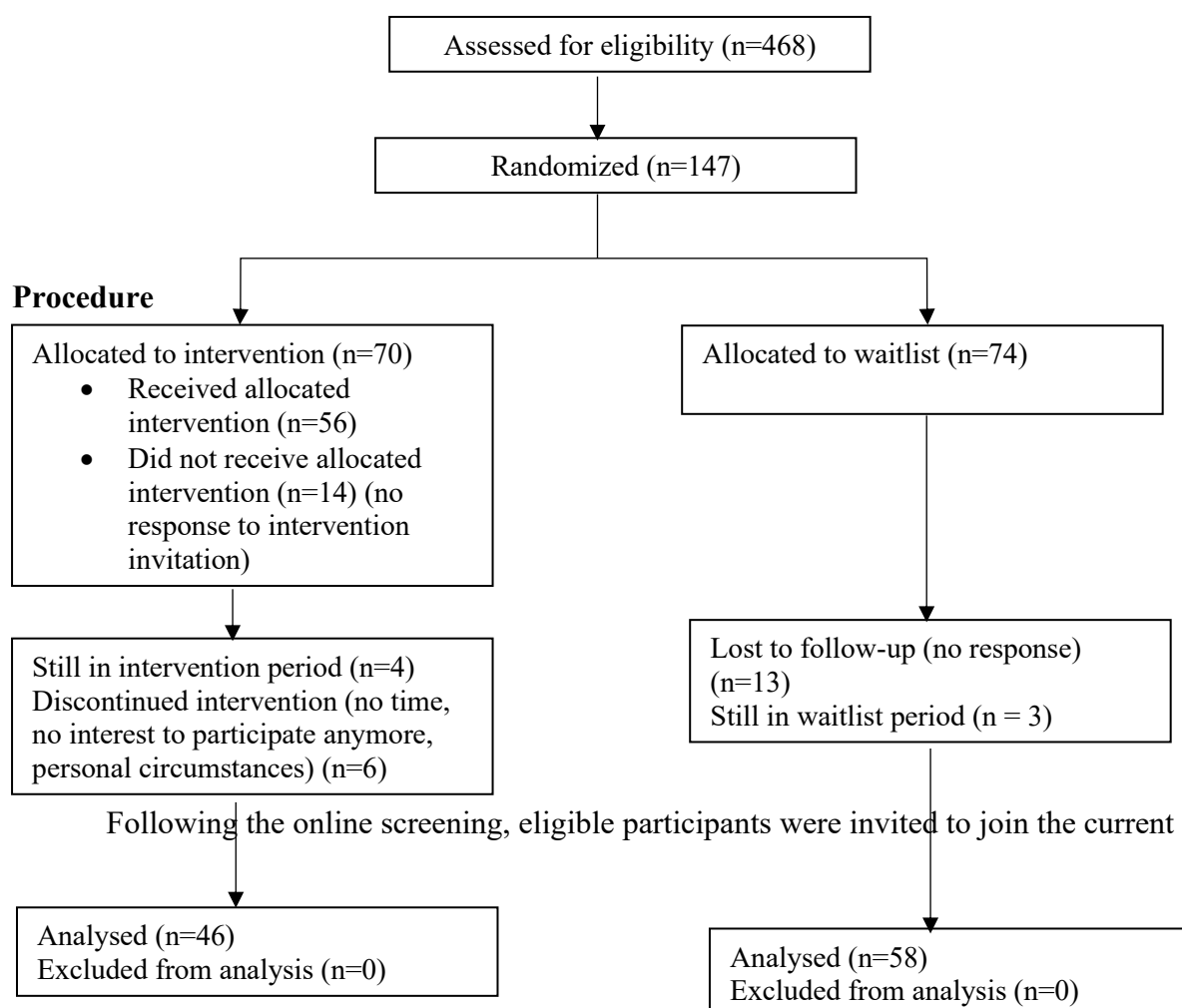
A total of 468 individuals completed the screening process, with 147 participants progressing to the first assessment and being randomly assigned to either the intervention or waitlist condition. Of the 147 individuals who completed baseline measures, 74.83% completed post-assessment ($N = 110$, experimental condition $n = 46$, waiting-list control condition $n = 58$). Notably, six participants from the intervention condition withdrew from the study. Consequently, the ultimate sample size for analysis was $N = 104$. The enrolment and participation flow in the present study is illustrated in Figure 1 through the CONSORT flow diagram (2010).

The determination of the required sample size was based on a priori power analysis conducted via G*Power (2007) for the primary research question. The anticipated effect size drew from the findings of van Doornik et al. (2023), who reported substantial post-

intervention effect sizes of MCP on the primary outcome measure of personal meaning. Van Doornik et al. (2023) used an α level of .05, a power of β = .80 and a medium effect size of f = .25, number of groups = 2, number of covariates = 1 and numerator df = 1. In this way, this paper's aimed sample size was N = 128. However, this amount of participants was not reached within this data collection. Therefore we used a bigger effect size of f = .30. In this way, we used a significance level (α) of .05, a power (β) of .80, a medium effect size (f) of .30, two groups, one covariate, and a numerator degree of freedom (df) of 1, the calculated sample size needed for the study was determined to be N = 90.

Figure 1.

Flow chart of participants

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                    ┌─────────────────────────────────────┐
                    │  Assessed for eligibility (n=468)    │
                    └─────────────────────────────────────┘
                                     │
                    ┌─────────────────────────────────────┐
                    │        Randomized (n=147)            │
                    └─────────────────────────────────────┘
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Procedure

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┌──────────────────────────────────┐          ┌──────────────────────────────────┐
│ Allocated to intervention (n=70)  │          │  Allocated to waitlist (n=74)     │
│  • Received allocated             │          │                                   │
│    intervention (n=56)            │          │                                   │
│  • Did not receive allocated      │          │                                   │
│    intervention (n=14) (no        │          │                                   │
│    response to intervention       │          │                                   │
│    invitation)                    │          │                                   │
└──────────────────────────────────┘          └──────────────────────────────────┘

┌──────────────────────────────────┐          ┌──────────────────────────────────┐
│ Still in intervention period (n=4)│          │ Lost to follow-up (no response)   │
│ Discontinued intervention (no time,│         │ (n=13)                            │
│ no interest to participate anymore,│         │ Still in waitlist period (n = 3)  │
│ personal circumstances) (n=6)     │          │                                   │
└──────────────────────────────────┘          └──────────────────────────────────┘
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Following the online screening, eligible participants were invited to join the current

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┌──────────────────────────────────┐          ┌──────────────────────────────────┐
│ Analysed (n=46)                   │          │ Analysed (n=58)                   │
│ Excluded from analysis (n=0)      │          │ Excluded from analysis (n=0)      │
└──────────────────────────────────┘          └──────────────────────────────────┘
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study. Those expressing interest in participating provided online informed consent and

proceeded to complete baseline measures, conducted online and taking approximately 30 minutes. The sequence of relevant measures for this study included demographics and the following questionnaires: the Meaning in Life Questionnaire (MLQ; Steger et al., 2006), the Depression, Anxiety, and Stress Scales (DASS-21; Lovibond & Lovibond, 1995), the Eating Disorder Examination Questionnaire 6.0 (EDE-Q; Fairburn & Beglin, 2008). Other scales used in the questionnaire are listed in Appendix B. Subsequently, participants were randomly assigned by the main researcher to either the experimental or waiting-list control condition through simple randomization via an online program (Random.org, 2023).

Participants in the experimental condition were then assigned by the main researcher to a personal therapist, who gave the participants six individual, weekly online sessions of MCP-ED. Post the final session, participants were invited to complete the post-assessment online, using the same measures and order as during baseline. Individuals in the waiting-list control condition did not receive any intervention. Seven weeks after completing baseline measures, they were invited to complete the online post-assessment. In cases of non-response, participants were contacted via email or phone. Following the conclusion of data collection, participants in the waiting-list control condition had the option to undergo MCP-ED.

Meaning-centered psychotherapy for eating disorders (MCP-ED)

MCP-ED is a six-week manualized intervention, designed to promote a sense of meaning in life (Van Doornik et al., 2023). In this way, the intervention aids the process of decreasing concerns related to weight and shape. The manual includes theoretical frameworks and exercises involving themes, linking life meaning and concerns about weight and shape. The development of MCP-ED involved close collaboration with experienced eating disorder therapists and input from individuals with eating disorders.

MCP-ED is an adaptation of the Dutch MCP manual designed for cancer survivors (Van der Spek & Verdonck-de Leeuw, 2017) and the individualized MCP manual (Breitbart et al.,

2018). Modifications include: reducing the session count from eight to six and adjusting terminologies, topics, and exercises to better suit the targeted age group and specific complaints. For instance, to make the manual more appealing to younger individuals, an emphasis is placed on viewing life meaning as a toolbox containing various tools or instruments that can assist participants in experiencing a sense of meaning in their lives (Van Doornik et al., 2023). These 'tools' are also called the four sources of meaning: (1) your personal life story, (2) dealing with life's limitations, (3) creating your own life, and (4) meaningful experiences (Frankl, 1959). Each session with the participant addresses one of these sources (Table 1).

Each weekly MCP-ED session lasts one hour and is done via videoconferencing. Participants receive a paper workbook via regular mail, which they will use every session to write down (homework) assignments. The sessions were available in Dutch, English, or German and were led by eight psychologists or master students trained in MCP-ED who had regular intervision meetings. For a comprehensive description of the original MCP, see Breitbart et al. (2015).

Table 1.

Session Topics Covered in MCP-ED

Sessions	MCP-ED	Assignments	Homework
1.	Introduction, theory on the concepts and sources of meaning, and its relationship with eating disorders.	The participant's definition of meaning is reflected on, meaningful experiences the participant had during the past week are discussed, and a video is watched of girls who no longer much about their body and weight.	Write down a meaningful experience each day.
2.	Personal life story (1): environmental influences	A positive and negative experience and the participant's life lessons she has learned from these experiences are discussed. Furthermore, a joyous, sad, and regrettable memory/experience/situation is discussed and the participant is	Create a timeline of the most important experiences, memories, people, relationships, etc. that made you become the person

		asked to reflect on important people that provide(d) a sense of meaning. Lastly, a word web is created with answers to the question: 'Who am I?'.	you are today.
3.	Personal life story (2): personal influences	Creating a timeline of the most important experiences, memories, people, relationships, etc. that made participants become the person they are today, creating a future timeline focusing on how the participant wants their future to look like.	Discuss your personal life story/timeline with an important other.
4.	Dealing with life limitations	Discussing what boundaries or limitations the participant is currently facing at this moment and how she deals with them, discussing the toolbox containing tools of ways to deal with life's limitations, making up goals, and writing down the first steps towards this goal.	Choose a goal to work on and taking the first steps towards this goal.
5.	Creating your own life and meaningful experiences	Discussing the participant's experience or events in which she showed courage, took responsibility for your own life or was committed to something, discussing experiences that made the participant feel that life has meaning.	Create an overview of the things the you have learned in the recent weeks, focused on personal life lessons, tools they want to use in the future, how she wants to use these tools, and what her goals are, taking new steps towards her goal.
6.	Presenting life lessons and reflecting on MCP-ED	The participant presents her life lessons, goals for the future, what steps she has taken towards these goals, and how the participant has experienced taking these steps, reflecting on the course of the intervention	

Measurements

This research was part of a master thesis and the questionnaire also included scales that are not used for this particular paper (see Appendix B).

Primary outcome measure

Meaning in life. The Presence of Life Meaning subscale from the Meaning in Life Questionnaire (MLQ; Steger et al., 2006) was used to assess life meaning as a primary outcome measure. The MLQ consists of two subscales: The Presence subscale (MLQ-P) and the Search for Meaning subscale (MLQ-S). Even though one could argue that the intervention encouraged participants to search for meaning, MCP-ED was not specifically tailored to address individuals' search for meaning. In this way, we did not have clear predictions regarding its impact on the search for meaning. Therefore, we chose to only look into MLQ-P for this paper. The MLQ-P subscale consists of five items, rated on a seven-point Likert scale ranging from 1 (*absolutely untrue*) to 7 (*absolutely true*). The responses for the subscale are summed, with higher scores indicating a greater presence of meaning in life. The Cronbach's alphas of the MLQ-P were .878 and .895 at baseline and post-assessment.

Secondary outcome measures

Eating disorder symptoms. Eating disorder symptoms were assessed using the Eating Disorder Examination Questionnaire 6.0 (EDE-Q; Fairburn & Beglin, 2008). This questionnaire, derived from the EDE interview, offers a comprehensive evaluation of the severity of eating disorder symptoms experienced over the past 28 days. Responses to the 22 items are graded on a scale from 0 (*No days/Not at all*) to 6 (*Everyday/Markedly*). The average score across these items is computed, with higher scores indicating a greater presence of eating disorder symptoms (cf Aardoom et al., 2012). The present Cronbach's alphas of the EDE-Q were excellent, ranging between .915 (baseline) and .948 (post-assessment).

Depressive symptoms. To assess depressive symptoms, the Depression subscale from the 21-item Depression, Anxiety, and Stress Scales (DASS-21; Lovibond & Lovibond, 1995)

was used. The DASS-21 consists of three subscales that measure the frequency of experience relevant to depression, anxiety, and stress during the last two weeks. Responses to items are rated on a scale from 0 (*Did not apply to me at all*) to 3 (*Applied to me very much, or most of the time*). The Depression subscale comprises seven items, and the scores are summed to generate a subscale within the range of 0-21. Given that the DASS-21 is a condensed version of the 42-item DASS (Lovibond & Lovibond, 1995), the subscore is doubled (subscore range 0–42), to facilitate comparison with scores based on the original DASS. The Cronbach's alphas of the Depression subscale varied between .874 and .897 at the two assessment points in the current study.

Statistical analyses

Three ANCOVAs were conducted to assess the impact of MCP-ED (DV) on MiL, eating disorder symptoms, and depressive symptoms (IVs). Firstly, to test the effects of MCP-ED on MiL (hypothesis 1), an ANCOVA was conducted with Condition (waiting-list control, experimental) as a between-subjects factor and post-assessment score on the MLQ-P as the dependent variable. The baseline score of the MLQ-P was included as a covariate. Secondly, an ANCOVA was performed to test the effect of MCP-ED on eating disorder symptoms (hypothesis 2), using the baseline score of EDE-Q as a covariate. Finally, the third ANCOVA was performed to test the effect of MCP-ED on depressive symptoms (hypothesis 3), using the baseline depression score (subscale of the DASS-21) as a covariate.

<div align="center">

Results

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Dropouts and missing data

During the course of this study, nineteen participants dropped out before post-assessment (17.3%, experimental condition $n = 6$, wait-list control condition $n = 13$). Dropouts did not differ significantly from those who completed the current study on the baseline scores of the primary outcome measure.

Assumption tests and descriptive data

In addition, the assumption for homogeneity of regression slopes was not met when testing the effect on MLQ-Q, EDE-Q, and Depression. The significant interaction effects imply that the impact of the treatment varies across different levels of the pre-score (Johnson, 2016; see Table 3, Table 4, and Table 6 in the Appendix). Proceeding with ANCOVA could, while this assumption is violated, influence the results. Therefore, alternative analytical approaches such as the Johnson-Neyman procedure must be considered (Fraas & Newman, 1997; Karpman, 1983; Kowalski et al., 1994; Rogosa, 1981). However, employing the Johnson-Neyman procedure would exceed the scope of this master thesis. Moreover, the assumption for normality was violated for DASS's subscale Depression. ANCOVA is robust to slight violations of the assumption of normality. Due to these two violations, the results can still be used when interpreted with caution (Johnson, 2016). There were no influential outliers (Cook's distance < 1). See Appendix A for a more comprehensive discussion of the assumption checks. Table 2 provides an overview of means and standard deviations for the primary and secondary outcome measures at all assessment points.

Table 2.

Descriptive statistics

	Experimental condition		Wait-list Control condition	
	Pre-intervention (*n* = 46) *Mean (SD)*	Post-intervention (*n* = 46) *Mean (SD)*	Pre-intervention (*n* = 58) *Mean (SD)*	Post-intervention (*n* = 58) *Mean (SD)*
MLQ-P	22.0 (6.32)	25.8 (5.39)	20.0 (5.7)	20.8 (5.93)
EDE-Q	3.0 (0.95)	2.06 (1.06)	3.0 (1.13)	2.8 (1.3)
DASS				
Depression	13.3 (9.4)	10.3 (8.5)	15.2 (10.2)	14.9 (9.88)

Note. MLQ-P = Meaning in Life Questionnaire (MLQ), Presence subscale (range 5–35; higher scores indicate the higher presence of meaning); EDE-Q = Eating Disorder Examination Questionnaire (range 0–6; higher scores indicate greater eating disorder psychopathology, scores > 4 are considered clinically significant; Carter et al., 2001); DASS = Depression, Anxiety, and Stress Scales, subscale Depression (0–42; higher scores indicate more symptoms of depression).

Primary outcome measure

Hypothesis 1. The ANCOVA including post-assessment MLQ-P showed a large and significant effect of condition, $F(1, 100) = 19.71$, $p < .001$, $\eta p^2 = .163$. Thus, participants in the experimental condition reported significantly higher levels of life meaning immediately after the intervention than participants in the waiting-list control condition, while controlling for the pre-scores.

Secondary outcome measures

The ANCOVAs including post-assessment EDE-Q and DASS depression both showed a significant effect of condition.

Hypothesis 2. The ANCOVA including post-assessment EDE-Q showed a large effect of condition, $F(1, 100) = 19.62$, $p < .001$, $\eta p^2 = .163$. Thus, participants in the experimental condition reported significantly lower levels of eating disorder symptoms immediately after the intervention than participants in the waiting-list control condition, while controlling for the pre-scores.

Hypothesis 3. The ANCOVA including post-assessment Depression showed a small effect of condition, $F(1, 100) = 6.14$, $p = .015$, $\eta p^2 = .057$. Thus, participants in the experimental condition reported significantly lower levels of depression immediately after the intervention than participants in the waiting-list control condition, while controlling for the pre-scores.

Discussion

The primary aim of the present study was to replicate the outcomes of Van Doornik and colleagues' (2023) paper under non-pandemic circumstances. In their study they sought to investigate whether MCP-ED increases MiL and decreases eating disorder symptoms in females with high weight and shape concerns. Consistent with our hypothesized expectations, our findings substantiate the efficacy of MCP-ED, showing an increase in meaning in life and reductions in both eating disorders after the intervention. Moreover, we found a significant decrease in depressive symptoms immediately following the intervention.

These results are in line with the findings of van Doornik et al. (2023), who demonstrated a positive impact of MCP-ED on individuals with weight and shape concerns during the COVID-19 pandemic. During the COVID-19 pandemic, individuals may have felt more miserable, which could have influenced the results. However, the current study

replicated the results of Van Doornik et al. (2023), which suggests that their results were not mainly driven by the coronavirus pandemic

Furthermore, the effectiveness of MCP-ED is likely due to its emphasis on enhancing the components of meaning in life, namely purpose, comprehension, and mattering (Baumeister & Vohs, 2002; van Doornik et al., 2023). The current study did not look into the components of MiL, but rather into the 'presence of MiL'. However, van Doornik et al. (2023) found increases in these components in participants after the MCP-ED intervention in their study. Firstly, the participants' purpose was increased after MCP-ED, participants reported a heightened sense of motivation and direction in their lives (George & Park, 2016). This could be due to MCP-ED's focus in the sessions on short- and long-term goals (session 5: 'Creating your own life', see Table 1), particularly those aligned with the participant's identity, thus contributing to an increase in sense of purpose (George & Park, 2016). Secondly, according to van Doornik et al. (2023), the participant's comprehension showed increases after the intervention. This could be due to the incorporation of life stories, as addressed in MCP-ED in sessions two and three: 'Personal life story', which enhances comprehension by creating coherence between events and the self (McLean, 2008, see Table 1). Thirdly, mattering could have been increased due to the emphasis on meaningful experiences, which is covered mainly in session 5: Meaningful experiences (see Table 1). Participants perceived their lives as more meaningful post-intervention, which could offer resilience during challenging life circumstances (George & Park, 2016). Thus, high meaning in life could equip a participant with tools to deal with life's challenges (Marco et al., 2019). Additionally, this idea is supported by the incorporation of Dealing with life's limitations in session four (see Table 1). Consequently, high meaning in life could serve as a protective factor against eating disorder symptoms (Marco et al., 2019).

Moreover, our findings indicate that MCP-ED is effective in lowering eating disorder symptoms in these individuals, suggesting the potential benefit of adding a MiL-enhancing component into existing psychotherapies for eating disorders (Marco et al., 2019; Van Doornik et al., 2023). It could also be considered as a standalone intervention for subclinical cases that do not meet the threshold for formal eating disorder symptoms. For example, future research could look into the effectiveness of the implementation of the protocol within primary mental healthcare settings (POH-GGZ). In this way, it could be implemented as a preventative intervention to prevent subclinical patients from developing an eating disorder in the future.

Additionally, the observed reduction in eating disorder symptoms due to an increase in MiL supports van Doornik and colleagues' (2023) finding of an inverse correlation between these variables. Thus, it is plausible that MCP-ED contributes to lowering the incentive value associated with eating disorder-related objectives, redirecting an individual's attention towards more adaptive sources of MiL (Cox et al., 2015). For example, MCP-ED does this by drawing the participant's attention to what is already meaningful in their lives and drawing attention to goals they want to accomplish (session 5: Creating your own life, Table 1). As a consequence, a shift in focus from eating disorder-related goals to broader life objectives may decrease preoccupations with weight and shape concerns.

Lastly, our results support the hypothesis that MCP-ED is effective in reducing depressive symptoms. It could be that the intervention's focus on goals and meaningful experiences/people (see Table 1), lowers depressive symptoms such as, for example, social isolation and lack of desire to make changes in one's life. Since MDD may have a role in perpetuating eating disorder symptoms (Keshishians et al., 2021) and MDD being a common comorbidity, it is useful that know that MCP-ED was able to reduce both. Future research should look into potential factors that could explain the working elements of MCP-ED in

lowering depressive symptoms. Additionally, it could be beneficial to look into the use of MCP in depression treatment on its own.

Strengths, limitations, and future directions

The present research has strengths, foremost among them being its replication of the study conducted by Van Doornik and colleagues (2023). This replication highlights the robustness of the effects identified in Van Doornik et al.'s (2023) research in non-pandemic circumstances, thereby addressing an important limitation of their research. In this way, our results support the evidence of the MDP-ED intervention. Another notable strength is the use of an RCT design coupled with a comparatively low dropout rate.

However, the study is not without its limitations. One limitation pertains to the selection of a subclinical sample comprising females with weight and shape concerns, rather than individuals meeting the diagnostic criteria for an eating disorder. As a consequence, the generalizability of our findings to eating disorder patients is constrained. Ongoing research by Van Doornik and colleagues is actively addressing this limitation by applying MCP-ED to individuals diagnosed with an eating disorder to evaluate its effectiveness in this patient group.

Additionally, the current investigation exclusively examines the immediate effects of MCP-ED post-intervention, however, in this way, we cannot draw any conclusions about the long-term effects of the intervention. Previous research did show lasting effects of MCP-ED on MiL and eating disorder symptoms (Van Doornik et al., 2023) after four weeks. Future research should explore whether similar effects endure and extend to longer-term follow-up assessments.

Furthermore, it is useful to investigate the incremental efficacy of MCP-ED when integrated into current psychotherapy for eating disorders. A comparative analysis between MCP-ED integrated into treatment as usual (TAU) and TAU could reveal potential

enhancements in therapeutic outcomes. Within the domain of depression treatment, exploring the benefits of incorporating MCP-ED is warranted, considering the documented relationship between heightened MiL and reduced depressive symptoms (Disabato et al., 2016).

Lastly, a limitation emerges from a final sample size ($N = 104$) falling short of the predetermined required sample size according to the power analysis ($N = 128$). In addition, the assumption for homogeneity of regression slopes was not met when testing the effect on MLQ-Q, EDE-Q, and Depression. The significant interaction effects imply that the impact of the treatment varies across different levels of the pre-score (Johnson, 2016; see Table 3, Table 4, and Table 6 in the Appendix). Proceeding with ANCOVA might influence the results. Moreover, the assumption for normality was violated for DASS's subscale Depression. ANCOVA is robust to slight violations of the assumption of normality, therefore it can still be used when the results are interpreted with caution (Johnson, 2016).

All in all, this study confirmed the effectiveness of the MCP-ED intervention in female undergraduates in non-pandemic circumstances. Future research should look into the potential integration of MCP-ED into existing treatments for ED symptoms.

Appendix A

Assumption testing: violated assumptions

In this section, we will elaborate on why the assumptions of ANCOVA have not been met.

To begin the assumption for homogeneity of regression slopes is violated for MLQ-P, EDE-Q and Depression. Firstly, the interaction between the prescore of MLQ and condition is significant (see Table 3). Secondly, the interaction between the prescore of EDE-Q and condition is significant (see Table 4). Finally, the interaction between the prescore of Depression and condition was significant (see Table 6).

Moreover, the assumption of normality is violated for depression. The data in the histogram does not follow a bell shape (see Figures 2 and 3) and the Shapiro-Wilk test is significant.

Table 3.

Test of Between-subjects Effects for MLQ-P

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	2211,081[a]	2	1105,540	64,398	<,001	,560
Intercept	620,834	1	620,834	36,163	<,001	,264
Condition * MLQ_T1	2211,081	2	1105,540	64,398	<,001	,560
Error	1733,910	101	17,167			
Total	58915,000	104				
Corrected Total	3944,990	103				

a. R Squared = ,560 (Adjusted R Squared = ,552)

Table 4.

Test of Between-subjects Effects for EDE-Q

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	85,577[a]	2	42,789	59,530	<,001	,541
Intercept	,632	1	,632	,880	,351	,009
Condition * EDEQMean_T1	85,577	2	42,789	59,530	<,001	,541
Error	72,597	101	,719			
Total	787,880	104				
Corrected Total	158,174	103				

Figure 2.

Histogram for Depression
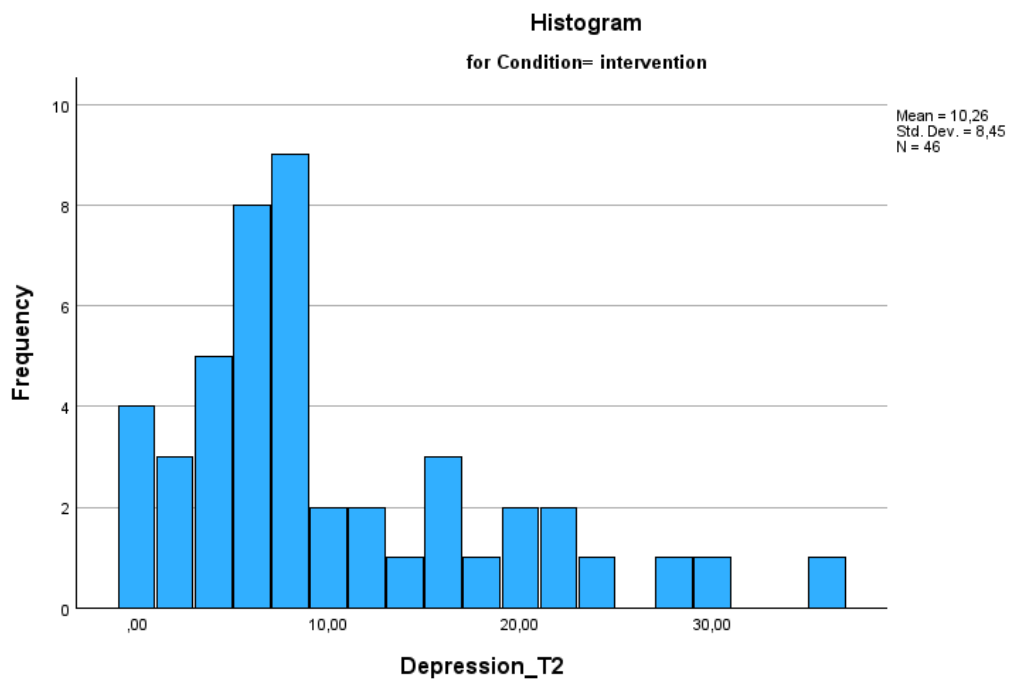
Figure 3.

Histogram for Depression

Histogram

for Condition= waitlist

Mean = 14,86
Std. Dev. = 9,877
N = 58
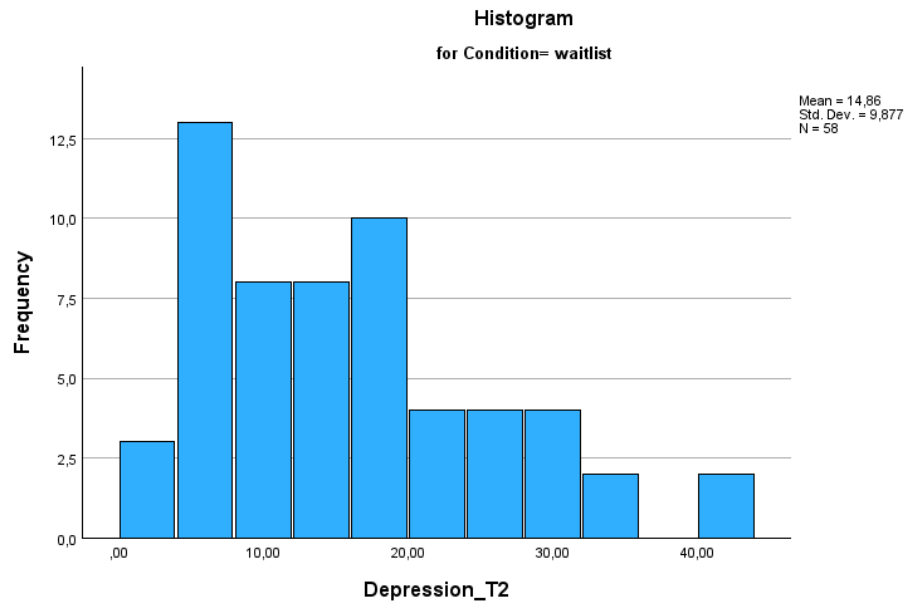
Table 5.

Test of Between-subjects Effects for Depression

		Shapiro-Wilk		
	Condition	Statistic	df	Sig.
Depression_T2	intervention	,884	46	<,001
	waitlist	,930	58	,002

Table 6.

Assumption check for homogeneity of regressions slopes for depression

Source	Type III Sum of Squares	df	Mean Square	F	Sig.	Partial Eta Squared
Corrected Model	4722.524	2	2361.262	51.909	<.001	.507
Intercept	406.300	1	406.300	8.932	.004	.081
Condition * Depression pre-score	4722.524	2	2361.262	51.909	<.001	.507
Error	4594.361	101	45.489			
Total	26428.000	104				
Corrected Total	9316.885	103				

Appendix B

The following scales were used in the questionnaire that were not relevant to this particular paper:

- Eating Disorder Inventory 2 (Garner, 1991): only subscales of bulimia / ineffectiveness / social insecurities / interpersonal distrust

- Multidimensional Existential Meaning Scale (George & Park, 2017)

- Balanced Measure of Basic Psychological Needs (Sheldon & Hilpert, 2012)

- Rosenberg Self-Esteem Scale (Rosenberg, 1965)

- Clinical Perfectionism Questionnaire (Fairburn et al., 2003)

- Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004)

- Brief Multidimensional Students' Life Satisfaction Scale-College version (Zullig et al., 2009)

Appendix C

ChatGPT (OpenAI, 2023) was used to streamline some of the sentences in this thesis.

The output was not directly copied into the text but rather used as an inspiration to better the

flow of sentences and use more 'academic' words. In this way, the revised text has been only

inspired by ChatGPT and then changed multiple times by again my own input.

Input	Revised
Rewrite this text in a more academic way and remove grammatical errors:	
Eating disorders (EDs) are impairing mental illnesses that can interfere with everyday functioning, lowering the quality of life and overall well-being of both patients and their caregivers (van Hoeken & Hoek, 2020).	Eating disorders represent incapacitating mental illnesses that significantly impede daily functioning, thereby diminishing the quality of life for both affected patients and their caregivers (Hoeken & Hoek, 2020)."
The excessive concern with weight and shape in ED patients sustains ED symptoms according to the Transdiagnostic cognitive-behavioral model of EDs (Fairburn et al 2003, Fairburn, 2008).	The transdiagnostic cognitive-behavioral model of eating disorders (Fairburn et al 2003, Fairburn, 2008) posits that an emphasis on shape and weight perpetuates the persistence of eating disorders symptoms and behaviors.
The experience of meaning in life (MIL) is negatively correlated with eating psychopathology (Gongora 2014; Brassai et al., Marco et al., 2017; Marco et al., 2019).	One of the many factors that are related to this excessive concern with weight and shape, is the experience of low meaning in life (MiL; Gongora 2014; Brassai et al., Marco et al., 2017; Marco et al., 2019).
Some studies indicate that ED patients believe life is less meaningful (Marco et al., 2017). Conversely, those who experience more MIL are better equipped to handle life's challenges (Marco et al., d2019).	Studies have indicated that eating disorder patients experience less meaning in life (Marco et al., 2017). Conversely, those who experience greater MiL are better equipped to handle life's challenges (Marco et al., 2019), suggesting a potential preventative role of MiL against eating disorder symptoms.
Thus, having a high sense of MIL may help prevent ED symptoms and might serve as a protective factor. Given that there is a negative correlation between MIL and ED symptoms, it is	Given the negative correlation between MiL and eating disorder symptoms, it could be beneficial to explore how treatment targeting the reduction of eating disorder symptoms could integrate a MiL component.

helpful to investigate how ED therapy could include this MIL component.

Currently, Cognitive Behavioral Therapy-Enhanced (CBT-E; Fairburn, 2008) is the preferred treatment for EDs. However, this therapy is not beneficial for everyone (Keel et al., 2005; Berends et al., 2018).

Adding a MIL-enhancing focused component to the present psychotherapies for EDs may be advantageous (Touyz & Hay, 2015; Marco et al., 2020; Van Doornik et al., 2021). According to Williamson et al. (2004), the objective of the treatment should be to decrease the overinvolvement with ED goals present in ED patients and increase engagement with other valued life goals. This would lower the incentive value of objectives associated with EDs, which may assist people in refocusing their attention on more adaptive sources of MIL (Cox et al., 2015).

A novel therapeutic protocol for Meaning-Centered Psychotherapy for the treatment of ED symptoms (MCP-ED) was created by Van Doornik and colleagues (2023) which was based on MCP by Breitbart and colleagues (2015). According to Breitbart et al.'s research, MCP-ED effectively increased experienced MIL and reduced ED symptoms.

Moreover, within EDs, comorbidity is prevalent. According to estimates 18-50% of people with EDs have major depressive disorder (MDD), which makes it one of the most prevalent comorbidities (Blinder et al., 2006; Hudson et al., 2007). Keshishian and colleagues (2021) claim that MDD may have a role in perpetuating EDS in individuals with an ED diagnosis. For

Although Cognitive Behavioral Therapy-Enhanced (CBT-E; Fairburn, 2008) is the prevailing treatment for eating disorders, its universal efficacy is not guaranteed (Keel et al., 2005; Berends et al., 2018).

Adding a MiL-enhancing-focused component to the present psychotherapies for eating disorders may be advantageous (Touyz & Hay, 2015; Marco et al., 2020; Van Doornik et al., 2021). According to Williamson et al. (2004) treatment objectives should involve diminishing overinvolvement with eating disorder goals and increasing engagement with valued life goals. This approach would lower the incentive value of objectives associated with eating disorders, facilitating a redirection of attention to more adaptive sources of MiL (Cox et al., 2015).

In an attempt to incorporate a MiL-enhancing intervention for treating eating disorder symptoms, a novel therapeutic protocol for Meaning-Centered Psychotherapy (MCP-ED) was created by Van Doornik and colleagues (2023), which was shown to be effective in female undergraduates with high shape and weight concerns. This protocol was adapted and based on MCP manuals by Breitbart and colleagues (2018), intended to decrease weight and shape concerns in females.

Additionally, beyond its potential efficacy in addressing weight and shape concerns, MCP-ED might also be effective in diminishing depressive symptoms, a prevalent comorbidity in eating disorders. Major depressive disorder (MDD) is estimated to afflict 18-50% of individuals with eating disorders (Blinder et al., 2006; Hudson et al., 2007). Keshishian and colleagues (2021) posit that MDD may have a role in perpetuating eating disorder

instance, depressive symptoms in anorexia nervosa may exacerbate social isolation or lack of desire to make changes in one's life. Therefore treating major depressive disorder symptoms may be needed to take into account when treating ED patients.	symptoms. For instance, depressive symptoms in anorexia nervosa may exacerbate social isolation or lack of desire to make changes in one's life. Thus, addressing MDD symptoms may be needed to take into account when trying to reduce weight and shape concerns.
Individuals with higher levels of depressive symptoms experience life as less meaningful (Remmers et al., 2023). Lower MIL is linked to higher levels of depression (Mascaro & Rosen, 2006), hopelessness, suicide and decreased well-being (Sinclair & Bryan, 2016). Those who find great meaning in their lives tend to have fewer symptoms of depression (Disabato et al., 2016). Thus, meaning-centered psychotherapy may be beneficial in lowering an individual's depressive symptoms.	Moreover, individuals with higher levels of depressive symptoms experience life as less meaningful (Remmers et al., 2023) and conversely, those who find great meaning in their lives tend to have fewer symptoms of depression (Disabato et al., 2016). Consequently, meaning-centered psychotherapy may hold promise in ameliorating depressive symptoms.
In this study, we, first, intend to replicate Van Doornik and colleagues research (2023) and address a limitation of their research. Namely, the fact that their data was gathered during the COVID-19 pandemic may have led to an overestimation of the impact of the treatment. Secondly, we want to test if MCP-ED could also reduce depressive symptoms	In light of the potential benefits of MiL in lowering eating disorder symptoms and depressive symptoms, our study has a main objective to replicate the findings of Van Doornik and colleagues (2023) under non-pandemic circumstances. Their data was gathered during the COVID-19 pandemic, which may have led to an overestimation of the impact of the treatment. It is possible that participants felt much more miserable than usual (Jaiswal et al., 2020; Muhktar, 2020) because they were seldom permitted to attend university during the data-collection period.
Rewrite in a more academic way: Data was collected in 2023 with N = 104 participants. Participants were recruited via the SONA pool of first year psychology students of the RUG and received X SONA credits after participation. Participants were randomly assigned to the experimental or wait-list condition. After an online screening with a survey including the Weight Concern Scale (WCS; Killen et al., 1994), was completed by X first-year female psychology students from the Rijksuniversiteit of Groningen.	The sample of this study consisted of 104 first-year female psychology students (M age = 19.66, SD = 2.27) who study in the Netherlands. The participants were approached through the online SONA platform that allows psychology students to earn credits by participants in psychology research. Participants were asked to fill in an online questionnaire in Qualtrics. No monetary compensation was offered to participants. A total of 468 individuals completed the screening process, with 147

	participants progressing to the first assessment and being randomly assigned to either the intervention or waitlist condition.
	Participants first completed an online screening using the WCS (Killen et al., 1994).
At base line, MIL was assessed with the Meaning in Life Questionnaire (Steger et al., 2006) and was used as a primary outcome measure. The secondary outcome measures measured at baseline were: Eating disorder symptoms measured by Eating Disorder Examination Questionnaire 6.0 (EDE-Q; Fairburn & Beglin, 2008); depressive symptoms measured by Depression, Anxiety and Stress Scales (DASS-21; Lovibond & Lovibond, 1995).	Those expressing interest in participating provided online informed consent and proceeded to complete baseline measures, conducted online and taking approximately 30 minutes.
The intervention the participants received was MCP-ED: a 6-week intervention that focusses on theory, exercises, and homework assignments that focus on themes related to life meaning and eating disorders. After the final session, participants were invited to complete the post-assessment (online, with the same measures as during the baseline). '	Participants in the experimental condition were then assigned by the main researcher to a personal therapist, who gave the participants six individual, weekly sessions of MCP-ED. This 6-week manualized intervention includes theoretical frameworks and exercises involving themes, linking life meaning and concerns about weight and shape. Seven weeks after completing baseline measures, they were invited to complete the online post-assessment.
MCP-ED is an adaptation of the Dutch MCP manual for survivors of cancer (Van der Spek & Verdonck-de Leeuw, 2017).	MCP-ED is an adaptation of the Dutch MCP manual designed for cancer survivors (Van der Spek & Verdonck-de Leeuw, 2017) and the individualized MCP manual.
There were a few adaptations such as: reducing amount of sessions from eight to six, changing the content to be more age appropriate and to eating disorder complaints. For instance, to make it more appealing for a younger audience,	Modifications include: reducing the session count from eight to six and adjusting terminologies, topics, and exercises to better suit the targeted age group and specific complaints. For instance, to make the concept of meaning more relatable to younger individuals, an emphasis is placed on viewing

a toolbox is used to display different sources of meaning.	life meaning as a toolbox containing various tools or instruments that can assist participants in experiencing a sense of meaning in their lives.
Rewrite more academically: The present study had the main objective to replicate the findings of Van Doornik and colleagues (2023) under non-pandemic circumstances and investigate whether MCP-ED increases meaning in life and decreases eating disorder symptoms as well as depressive symptoms in females with high weight and shape concerns. In line with our hypotheses, our results showed support for MCP-ED to be effective in increasing meaning in life and decreasing eating disorders and depressive symptoms immediately after the intervention. Moreover, these findings are also in supported the efficacy of MCP-ED in decreasing eating disorder symptoms in these individuals. In this way this suggests the beneficity of adding an MiL-enhansing component to present psychotherapies for eating disorders (Marco et al., 2019; Van Doornik et al., 2023) or it could be used as a standalone intervention for a subclinical individuals who have below threshold eating disorder symptoms for example	The primary aim of the present study was to replicate the outcomes of van Doornik and colleagues (2023) under non-pandemic circumstances. The study sought to investigate whether MCP-ED increases meaning in life and decreases eating disorder symptoms and depressive symptoms in females with high weight and shape concerns. Consistent with our hypothesized expectations, our findings substantiate the efficacy of MCP-ED, showing an increase in meaning in life and reductions in both eating disorders and depressive symptoms immediately following the intervention. Moreover, our findings indicate that MCP-ED is effective in lowering eating disorder symptoms in these individuals, suggesting the potential benefit of adding a MiL-enhancing component into existing psychotherapies for eating disorders (Marco et al., 2019; van Doornik et al., 2023). It could also be considered as a standalone intervention for subclinical cases that do not meet the threshold for formal eating disorder symptoms. For example, future research could look into the effectiveness of the implementation of the protocol within primary mental healthcare settings (POH-GGZ). In this way, it could be implemented as a

to be used by the POH-GGZ. This reduction in eating disorder symptoms due to an increase in meaning in life supports van Doornik and colleagues (2023)'s finding of an inverse corelation between these two variables. It could be possible that MCP-ED could play a role in loverwing the incentive value of objectives assoiated with eating disorders and redirect and individuals attention to more adaptive sources of Mil (Cox et al., 2015). In this way the individuals focus would shift to other other life goals from eating disorder related goals, which could decrease preoccupations their weight and shape. Finally, our results supported the hypothesis that MCP-ED could reduce depressive symptoms. This could be in line with the idea that MDD may have a role in perpetuating eating disorder symptoms (Keshishians et al., 2021), leading to social isolation and a lack of desire to make changes in one's life. Thus, addressing depressive symptoms in eating disorder treatment may be of importance when trying to reduce weight and shape concerns. Moreover, since those who experience more meaning in their lives, tend to have lower depressive symptoms (Disabato et al., 2016), meaning-centered psychotherapy in general may hold promise to be included in depression treatment.

preventative intervention to prevent subclinical patients from developing an eating disorder in the future.

Lastly, our results support the hypothesis that MCP-ED is effective in reducing depressive symptoms. It could be that the intervention's focus on goals and meaningful experiences/people (see Table 1), lowers depressive symptoms such as social isolation and lack of desire to make changes in one's life. Since MDD may have a role in perpetuating eating disorder symptoms (Keshishians et al., 2021) and it is a common comorbidity, it is of important that we know that MCP-ED was able to reduce both. Future research should look into potential factors that could explain the working elements of MCP-ED in lowering depressive symptoms. Additionally it could be benefition to look into the use of MCP in depression treatment on its own.

Rewrite, and paraphrase this text more academically and scientifically. Strengths, limitations, and future research Strenghts of the current research is that it replicates a study done by van Doornik and colleages (2023), supporting that the effect found in their research is robust in non-pandemic circumstances. In this way it support the evidence of the MDP-ED intervention. Another strength of the research was the use of a RCT and a relatively low drop out rate. There are a few limitations that needs to be discussed. To begin, it was chosen to use a subclinical sample, females with high body and weight concerns, instead of individuals that do meet the criteria of an eating disorder. In this way, it is impossible to generalise our findings to eating disorder patient's. Currently van Doornik and colleagues are conducting research where they apply the intervention to eating

The present research has strengths, foremost among them being its replication of the study conducted by Doornik and colleagues (2023). This replication highlights the robustness of the effects identified in van Doornik et al.'s research in non-pandemic circumstances, thereby addressing an important limitation of their research. In this way, our results support the evidence of the MDP-ED intervention. Another notable strength is the use of an RCT design coupled with a comparatively low dropout rate.

However, the study is not without its limitations. One limitation pertains to the selection of a subclinical sample comprising females with weight and shape concerns, rather than individuals meeting the diagnostic criteria for an eating disorder. As a consequence, the generalizability of our

disorder patients to see if the intervention is still effective. Furthermore, our study only looked into the immediate effect of MCP-ed, right after the intervention. However, in this way we cannot say anything about the longer term effects of MCP-ED. Previous research did show lasting effects of MCP-ED on MiL and eating disorder symptoms (van Doornik et al., 2023) after four weeks. In the future it would be worth investigating whether this is also the case under non-pandemic circumstances and using into even longer-term follow-up assessment. Moreover, it is necessary to investigate whether MCP-ED has incremental efficacy when included into current psychotherapy for eating disorders. In the future this could be investigated by comparing treatment as usual to MCP-ED integrated into the existing treatment. This same notion goes for depression treatment. Since those who experience more meaning in their lives, tend to have lower depressive symptoms (Disabato et al., 2016), future research could look into benefit of including meaning-centered psychotherapy into depression treatment. Another limitation the final sample was smaller (N =) than required according to the power analyses (N =). The final limitation is the use of only females, which makes it hard to generalize these findings to males. Males should be included in future research in the effecicacy of MCP-ED. The final recommendation for future research would be aiming to look into mediating factors. In this way it can be investigated whether the effects of MCP-ED on reducing eating disorder symptoms is actually due to MCP-ED.

findings to eating disorder patients is constrained. Ongoing research by van Doornik and colleagues is actively addressing this limitation by applying MCP-ED to individuals diagnosed with an eating disorder to evaluate its effectiveness in this patient group.

Additionally, the current investigation exclusively examines the immediate effects of MCP-ED post-intervention, however, in this way, we cannot draw any conclusions about the long-term effects of the intervention. Previous research did show lasting effects of MCP-ED on MiL and eating disorder symptoms (van Doornik et al., 2023) after four weeks. Future research should explore whether similar effects endure and extend to longer-term follow-up assessments.

Furthermore, it is useful to investigate the incremental efficacy of MCP-ED when integrated into current psychotherapy for eating disorders. A comparative analysis between MCP-ED integrated into treatment as usual (TAU) and TAU could reveal potential enhancements in therapeutic outcomes. Within the domain of depression treatment, exploring the benefits of incorporating MCP-ED is warranted, considering the documented relationship between heightened MiL and reduced depressive symptoms (Disabato et al., 2016).

Lastly, a limitation emerges from a final sample size (N = 104) falling short of the predetermined required sample size according to the power analysis (N = 128). In addition, the assumption for homogeneity of regression slopes was not met when testing the effect on MLQ-Q, EDE-Q, and Depression. The significant interaction effects imply that the impact of the treatment varies across different levels of the pre-score (Johnson, 2016; see Table 3, Table 4, and Table 6 in the Appendix). Proceeding with ANCOVA might influence the results. Moreover, the assumption for normality was violated for DASS's subscale Depression. ANCOVA is robust to slight violations of the assumption of normality, therefore it can still be used when the results are interpreted with caution (Johnson, 2016).

The interaction effects suggest that the treatment effects are not the same across levels of the pre-score. Proceeding with ANCOVA could lead to mistakenly concluding that the post-score did not differ significantly by condition. As a result, alternative analytical approaches must be considered, such as the Johnson-Neyman procedure (Fraas & Newman, 1997; Karpman, 1983; Kowalski et al., 1994; Rogosa, 1981). However, we did not conclude that the post-score did not significantly by condition, and using the Johnson-Neyman procedure would be beyond the scope of this masterthesis.	The significant interaction effects imply that the impact of the treatment varies across different levels of the pre-score (Johnson, 2016; see Table 3, Table 4, and Table 6 in the Appendix). Proceeding with ANCOVA could while this assumption is violated might influence the results. Therefore, alternative analytical approaches such as the Johnson-Neyman procedure must be considered (Fraas & Newman, 1997; Karpman, 1983; Kowalski et al., 1994; Rogosa, 1981). However, employing the Johnson-Neyman procedure would exceed the scope of this master thesis.
Rewrite: This is because the COVID-19 pandemic could have resulted in an overestimation of the treatment effect.	This approach is motivated by the recognition that the COVID-19 pandemic may have introduced confounding variables potentially inflating the perceived treatment effect.

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