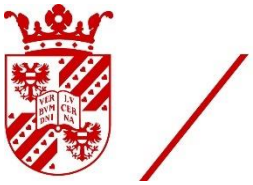

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Meaning-Centered Intervention, Eating Disorder Symptoms and Perfectionism: A Randomized Controlled Trial

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Abstract

Meaning in life is considered to play a part in eating disorders. More specifically, low meaning in life is associated with high eating disorder symptoms. A new intervention was developed to treat these disorders: the Meaning Centered Intervention adjusted for eating disorders (MCI-ED). This study is a replication of a previous randomized controlled trial by Van Doornik et al. (2023) performed during the lockdown period of Covid. The hypotheses of the current study are that the MCI-ED significantly increases meaning in life and significantly decreases eating disorder symptoms and perfectionism. Participants were adolescent female students at the University of Groningen with high weight and shape concerns. They were on average 19.66 years old (SD= 2.26) and 43.3% reported Dutch to be their primary language. Participants (N=104) were randomly divided between the intervention condition (N=46) and the waitlist condition (N=58). Participants in the intervention condition received six one-hour online intervention sessions with a trainer that revolved around different aspects of meaning in life. Following a pre- and post-test design, all participants were asked to fill in questionnaires about meaning in life, eating disorder symptoms and perfectionism in the 1st and 7th week of the process. Results showed that meaning in life increased significantly and eating disorder symptoms significantly decreased in participants that follow the intervention compared to those that did not. For perfectionism, no significant result was found. This implies that the MCI-ED is effective in treating eating disorder symptoms and increasing meaning in life.

Keywords: Meaning in Life, Eating Disorder, Perfectionism, Randomized Controlled Trial

Meaning-Centered Intervention, Perfectionism and Eating Disorder Symptoms: A Randomized Controlled Trial

Eating disorders (ED) can have a significant negative effect on (mental) health and quality of life (Campbell & Peebles, 2014). They are difficult to treat and people who are treated for these disorders, often relapse (Sala et al., 2023). At this point in time, the most used treatment for eating disorders is Cognitive Behavioural Therapy (CBT; Kaidesoja et al., 2022). Although CBT is more effective in its treatment for ED's than other treatments like pharmacotherapy and general psychotherapy (Monteleone, 2022), there is still a group of patients whose symptoms do not decrease after treatment (Sala et al., 2023). Thus, it could be worth it to look for further treatment options.

This study focuses on testing a new ED-intervention: Meaning-Centered Intervention adjusted for eating disorders (MCI-ED). This intervention aims to improve a person's meaning in life by talking about different meaningful aspects of their life and in doing so, decrease eating disorder symptoms in those who participate. Meaning in life is scientifically divided into three categories (George & Park, 2016): by how well one's life is perceived as comprehensible (comprehension), guided by valued goals (purpose), and significant in the broader world (mattering). Low meaning in life has previously been associated with a negative attitude towards food, body dissatisfaction, hopelessness, borderline symptoms (Marco et al., 2019) and eating disorder symptoms (Marco et al., 2021). So possibly, attributing meaning to life can be regarded as a therapeutic approach for addressing symptoms of eating disorders. The MCI-ED aims to improve meaning of life, and thereby decrease eating disorder symptoms. The first study that researched this intervention has been executed by Van Doornik et al. (2023). They adjusted Meaning Centered Psychotherapy (MCP) to use it on clients with eating disorder (MCI-ED). MCP was originally created by Breitbart et al. (2015) as a group-based intervention for people with advanced cancer. The randomized

controlled study done by Breitbart et al. (2015) showed significant results regarding increased quality of life and decreased psychopathology symptoms. The original MCP was further developed and adjusted to be suitable for ED-treatment. This next version, MCI-ED, showed significant improvement in eating disorder symptoms in its first trial (Van Doornik et al., 2023). During this study, participants were divided between an intervention condition and a waitlist control condition. Participants in the intervention condition attended six weekly one-hour online sessions with a trained instructor. Each session had a specific topic related to the increasement of meaning in life. However, the study was performed during the COVID pandemic. This may have interfered with the generalizability of the results, in a way that people had limited possibilities for social contact during the lockdown period of the pandemic. So, it cannot be excluded that part of the effect of the intervention was that participants had the chance to talk to someone. With the ending of the pandemic, we can now systematically replicate the study to see whether the observed results endure with the same level of promise documented in the previous study.

Next to meaning in life, we assess what influence MCI-ED has on perfectionism. It is known that perfectionism can have a negative effect on mental health (Doyle et al., 2022) and correlates negatively with self-acceptance (Flett et al., 2003) and meaning in life (Suh & Chong, 2021). Increasing meaning in life could then possibly decrease perfectionism. Scientific research has indicated a positive correlation between elevated levels of perfectionism and heightened manifestations of eating disorder symptoms (Bills et al., 2023). Furthermore, interventions targeting perfectionism have demonstrated efficacy in mitigating the associated risks of eating disorders (Wilksch et al., 2008). A longitudinal study by Holland et al. (2013) including more than 1300 participants revealed that perfectionism not only served as a significant risk factor in the initiation of eating disorders but also exhibited predictive value in sustaining these disorders, as evidenced by a 10-year follow-up

examination. The decrease of perfectionism could therefore lower the risk of eating disorder onset and maintenance. High perfectionism also has a negative effect on general treatment outcomes (Egan et al., 2011), so next to the decrease in eating disorder symptoms, it could also benefit the efficacy of the treatment. In conclusion, there are many benefits in reducing perfectionism, some of which are related to the treatment of eating disorders. Therefore, next to eating disorder symptoms, this study focuses on the effect of MCI-ED on perfectionism.

Current study

As the period of adolescence is critical in the development of eating disorders (Bakalar et al., 2015), the current study focuses on this age group.. As young women are much more likely to develop an eating disorder than young men (5.5-17.9% versus 0.6-2.4%; Silén & Keski-Rahkonen, 2022), this study includes only young women. Because this intervention is only newly developed and its effects are not yet clear, this study only recruits participants that have increased eating disorder symptoms, but not an eating disorder. The main aim of this study is to replicate the findings by Van Doornik et al. (2023) and further clarify what effects the MCI-ED has on eating disorder symptoms and perfectionism of participants.

Research question

Does the Meaning-Centered Intervention increase meaning in life and decrease eating disorder symptoms and perfectionism in adolescent women with high weight and shape concerns, compared to a control group?

Hypotheses

1. Meaning in life in adolescent women is significantly higher after Meaning-Centered Intervention than before, compared to the control group;
2. Eating disorder symptoms in adolescent women are significantly lower after Meaning-Centered Intervention than before, compared to the control group;
3. Perfectionism in adolescent women is significantly lower after Meaning-Centered

Intervention than before, compared to the control group.

Method

Participants

In this study, data derived from a precedent study served as the foundational dataset. In 2022 and 2023, the participants were recruited for this study through the University of Groningen. The number of participants is 104. 46 participants were in the intervention condition and 58 participants were in the waitlist condition. The mean age of the participants was 19.66 (SD=2.26), the average height 169.33 (SD=6.78), and the average weight 68.50 (SD=14.19). The highest level of education was 94.2% high school or equivalent and 5.8% bachelor's degree. The primary language of the participants was 43.3% Dutch, 15.4% German, 9.6% English, 9.6% Bilingual and 22.1% filled in "other". Among those other languages were Romanian, Polish, Greek and others.

All of the participants were students at the University of Groningen who signed themselves up in exchange for study credits. By using individual screening, the students were selected in line with the inclusion criteria. Students were included if they (1) were female, (2) were between 18 and 35 years old, (3) scored at least 47 points on the adjusted Weight Concern Scale (WCS; Killen et al., 1994) or (4) answer 'Often' or 'Always' to the question 'Do you ever feel fat?' from the WCS. The WCS was adjusted in line with Jacobi et al. (2004), so that each of the five items equal to a maximum score of 20. The total scale is 0-100. Students were not invited to participate on the study if they did not meet the inclusion criteria. See the flow chart Figure 1 of the Appendix for the detailed process.

The necessary number of participants was calculated through an a priori power analysis (G*Power 3; Faul et al., 2007). Because the intervention of Van Doornik et al. (2023) showed an effect size of .25, we also aimed for $f = .25$. Further, $\alpha = .05$, df = 1, number of groups = 2, and number of covariates = 1 were used to generate a sample size. The required sample size

was n = 210. This number of participants was not reached. For the reached number of participants (n=104), a power of .95 is reached through an effect size of .36.

Procedure

For the exact treatment protocol, see Doornik et al. (2023). In short, the intervention consists of six weekly one-hour individual online meetings that discuss different aspects of meaning in life (personal life story, dealing with life's limitations, creating your own life and experiences). During the meetings, participants discussed bits of theory related to meaning in life and the topic of the week. After each bit of theory, participants were asked to do assignments that allowed them to apply the theory to their personal life. At the end of each meeting, the homework for next week was explained. The results of the homework were discussed at the start of each new meeting. An overview of the sessions can be found in table 1. The interventions were executed by Clinical Psychology master students from the University of Groningen who did this as a part of their master thesis and they received specialized training beforehand. Participants were randomly assigned to either the treatment condition or the waitlist control condition. The randomisation was executed through the Random Integer Generator (Haahr, n.d.).

This study has a pre-post-test design where participants in the treatment condition had to fill out questionnaires before the intervention, receive the intervention and fill out the same questionnaires after the intervention was completed, so 6 weeks later. Participants in the control condition filled out the questionnaires in the same time span, so once in week 1 and once in week 7, but without receiving the intervention. Participants in both conditions were asked to fill in the questionnaire for a third time, four weeks after the ending of the intervention. So in total, the participants filled in the same online questionnaire three separate times. After filling in the questionnaire for the last time, participants in the waitlist condition had the opportunity to participate in the intervention if they wanted to. The filling in of the

questionnaire took about 30 minutes each time.

Next to the measures mentioned in the next section, other questionnaires were also used as a part of a bigger research project. The other questionnaires were: Balanced Measure of Psychological Needs (BMPN; Sheldon & Hilpert, 2012), Depression Anxiety and Stress Scales (DASS-21; Norton, 2007), Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004), Eating Disorder Inventory (EDI-2; Garner, 1991), Color-Word Inference (CWI-II; Grand, 1968), Multidimensional Existential Meaning Scale (MEMS; Park et al., 2021) and the Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1979).

Table 1

Overview of topics and homework assignments of MCI-ED

	Topic of the session	Homework
Session 1	Introduction and theory on the concept and sources of meaning.	Write down at least one thing that is meaningful to you for each day of the week.
Session 2	Personal life story (I): environmental influences.	Build an outline of all of the most influential pieces of your life.
Session 3	Personal life story (II): personal influences.	Share a timeline of your life with one or more important people in your life.
Session 4	Dealing with life's limitations.	Choosing a goal that you want to achieve, write down which steps you have to take

		and take that first step.
Session 5	Creating your own life and meaningful experiences.	Take the next step towards achieving your goal and create a presentation of all the things you learned during the intervention.
Session 6	Presenting life lessons and reflecting on the intervention.	

Measures

Primary outcome measures

Meaning in life

Meaning in life was measured by the Meaning in Life Questionnaire – Presence (MLQ-P; Steger et al., 2006). The Meaning in Life Questionnaire has two subscales: MLQ-P (presence of meaning in life) and MLQ-S (search for meaning in life). This intervention aims to change the presence of meaning in life, so MLQ-P will be used as a primary outcome measure. The MLQ-P contains five items that are scored on a 7-point Likert scale, where 1 is "Absolutely untrue" and 7 "Absolutely true". One example of an item is "I have a good sense of what makes my life meaningful.". High total scores indicate a high presence of meaning in life. Cronbach's alpha for this questionnaire is .878 at baseline and .895 at post-assessment.

Eating disorder symptoms

Eating disorder symptoms were measured by the Eating Disorder Examination Questionnaire (EDE-Q; Fairburn & Beglin, 2008). The EDE-Q measures the presence of eating disorder symptoms in the last 28 days. 22 items were used which measure the restraint,

weight concerns, shape concerns, and eating concerns subscales. The questionnaire starts with the question “On how many of the past 28 days…” and each item is a specific type of eating disorder symptom. For example, “Have you had a definite desire to have a *flat* stomach?”. Participants can fill in their answer for each item on a scale from 0-6 where 0 is “No days” and 6 “Every day”. High mean scores indicate high eating disorder symptoms. Cronbach’s alpha for this questionnaire is .915 at baseline and .948 at post-assessment.

Perfectionism

Perfectionism was measured by the Clinical Perfectionism Questionnaire (CPQ; Stoeber & Damian, 2014). The CPQ has 12 items which are scored on a scale from 1-4, where 1 is “Not at all” and 4 “Always”. An example of a question is “Have you felt a failure as a person because you have not succeeded in meeting your goals?”. A high total score indicates high perfectionism. Cronbach’s alpha is .778 at baseline and .744 at post-assessment.

Statistical Analysis

To test the hypotheses, three ANCOVA’s will be executed with treatment/control condition as independent variable and meaning-in-life, eating disorder symptoms and perfectionism as dependent variables. The baseline scores of the dependent variables will be used as covariates.

Results

Dropouts, missing data

Six participants did not fill in the second questionnaire and therefore, they were excluded from data analysis. They were all in the intervention condition. Their reasons were no time / no interest to participate anymore / personal circumstances. We compared the data in boxplots, which can be found in the appendix. Only one outlier was found, so it will most likely not have a large impact on the analysis. There was no significant difference found between the mean scores of the participants that dropped out and those that did not, so the

data of the dropouts was deleted from the dataset. Apart from the dropouts, there was no missing data in the output.

Assumption checks

For the MLQ, the assumption of normality is violated. The Shapiro Wilk test is significant with p=.049 for the waitlist condition. However, but the histogram follows a bell shape and the scores on the Q-Q plot also seem normally distributed. So, the violation is very small. For all three variables, the assumption of homogeneity of regression slopes is not met because there is a significant effect for condition*pretest (p<.001). These violations of homogeneity of regression slopes can be dealt with through the use of various different analytical methods (Johnson, 2016). However, those are too complicated for a master thesis of this scope, so the results have to be taken into careful consideration due to the violations of assumptions mentioned here. Also, for the CPQ, one outlier is found in the boxplot in the waitlist condition of the post-test. The assumption of normality is not violated so the outlier was not removed.

All of the plots and tables that were used to assess the assumption of normality and assumption of linearity are shown in the appendix (figure 2-19; table 3-5).

Primary outcome measure

Meaning in life

The mean and standard deviation of the outcome variables for the two conditions for both assessment points can be found in Table 2. This includes also those for the secondary outcome measures.

To test the first hypothesis “Meaning in life in adolescent women is significantly higher after Meaning-Centered Intervention than before, compared to the control group”, an ANCOVA was executed with post-assessment MLQ-P as a dependent variable, baseline MLQ-P as a covariate and condition as a between-subject factor. The results of the ANCOVA analyses for all three variables can be found in table 3. This analysis showed a significant

increase in meaning in life between participants in the intervention condition and participants in the waitlist condition. This result means that the first hypothesis is confirmed by the data and has a large effect size.

Table 2

Means and standard deviations of the primary and secondary outcome measures

	Intervention condition		Waitlist 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	22.04 (6.32)	25.76 (5.39)	20.05 (5.67)	20.79 (5.93)
EDE-Q	3.02 (.95)	2.06 (1.06)	2.95 (1.13)	2.78 (1.29)
CPQ	31.48 (6.01)	29.48 (5.80)	31.12 (5.58)	30.57 (4.77)

Note. Calculated through ANOVA. MLQ-P = Meaning in life (Presence scale), EDE-Q = Eating Disorder Examination Questionnaire, CPQ = Clinical Perfectionism Questionnaire.

Table 3

ANCOVA's of primary and secondary outcome measures

	F	*p*	η_p^2
MLQ-P	19.71	<.001	.163
EDE-Q	19.62	<.001	.163
CPQ	3.22	.076	.031

Note. MLQ-P = Meaning in life (Presence scale), EDE-Q = Eating Disorder Examination Questionnaire, CPQ = Clinical Perfectionism Questionnaire.

Secondary outcome measures

Eating disorder symptoms

For the second hypothesis "Eating disorder symptoms in adolescent women are significantly lower after Meaning-Centered Intervention than before, compared to the control group", a second ANCOVA was executed with post-assessment EDE-Q as the dependent variable, baseline EDE-Q as a covariate and condition as a fixed variable. This analysis showed a significant decrease in eating disorder symptoms between participants in the intervention condition and participants in the waitlist condition. Thus, the second hypothesis is confirmed by the data. The effect size is large.

Perfectionism

For the third and last hypothesis "Perfectionism in adolescent women is significantly lower after Meaning-Centered Intervention than before, compared to the control group", a final ANCOVA was executed with post-assessment CPQ as the dependent variable, baseline CPQ as the covariate and condition as a fixed variable. This analysis showed a nonsignificant effect in perfectionism between participants in the intervention condition and participants in the waitlist condition., so the third hypothesis is not confirmed by the data.

Discussion

In this study, we tested the meaning-in-life-based intervention on young women with increased weight and shape concerns. For six weeks, participants in the intervention condition had individual online meetings with a trainer. During these meetings, the intervention protocol (described in the method section) was followed. Meaning in life, eating disorder symptoms and perfectionism was measured before and after the intervention took place. The results of the intervention-participants were compared to the results of the waitlist control group. The first hypothesis was confirmed, as participants of the intervention group reported significantly higher meaning in life after the intervention than participants from the control

group. A large effect size was found. The second hypothesis was also confirmed by these results because the participants that underwent the intervention showed significantly lower eating disorder symptoms than participants that did not take part in the intervention. A large effect size was found. Lastly, the third hypothesis was not confirmed by the data, because the results for perfectionism do not differ significantly between the intervention group and the control group.

Shortly, a significant difference can be found in meaning in life, eating disorder symptoms between those who underwent the intervention and those who did not. However, the MCI-ED did not lead to a change in reported perfectionism.

Together with the outcomes produced by Van Doornik et al. (2023), the meaning in life based intervention has promising results for the future. The research of Van Doornik et al. (2023) also produced significant results for EDE-Q. During lockdown conditions in the COVID-pandemic, people generally were more socially isolated than before due to restrictions by the government (Keijsers & Bülow, 2021). These results show that the effectiveness of the MCI-ED persists after the ending of the COVID-pandemic.

Theoretical and practical implications

The results of this study support the findings of previous studies that meaning in life and eating disorder symptoms are negatively correlated (Marco et al., 2021; Van Doornik et al., 2022; Van Doornik et al., 2023). Even though Suh & Chong (2011) report that high meaning in life is associated with low perfectionism, the results of this current study show that the MCI-ED does not significantly decrease perfectionism.

An explanation for this could be that the intervention was not developed to directly target perfectionistic behaviour. Perfectionism is typically divided into two dimensions (Comerchero & Fortugno, 2013): Adaptive Perfectionism (AP) and Maladaptive Perfectionism (MP). MP is related to negative cognitions about the self, where AP is

associated with positive psychological outcomes. MP should be decreased to increase well-being but AP should not. In this study, perfectionism was measured as a whole, with no distinction between these two dimensions. The negative thoughts related to failure are associated with MP and are discussed in the intervention. However, practice with goal setting is also a part of the intervention, which is more related to AP. It is not clear what the effect of the interventions was on these separate dimensions of perfectionism.

Next to this, perfectionism correlates with several personality traits of the Five Factor Model (FFM; Smith et al., 2019). The personality traits of the FFM are considered to be fairly stable (Rantanen et al., 2007). Because of this stability, perfectionism may be resistant to change. This could possibly explain why the intervention had no significant effect on perfectionism.

Even though no significant effect was found for the reduction of perfectionism, it seems that the intervention has succeeded in increasing meaning in life and indirectly improving eating disorder symptoms. This means that after following the intervention, participants reported higher meaning in life and lower eating disorder symptoms than participants who did not follow the intervention. This effect might be partially explained by the first source of meaning in life: personal life story. Talking coherently and evaluatively about your own life is associated with higher well-being and higher meaning in life (Fivush et al., 2017). The second source of meaning in life is dealing with life's limitations, which is essentially focused on coping styles. Coping self-efficacy means that someone is confident in their ability to constructively cope with challenges and limitations and live through them. This is something that is focused on during the fourth session and it is positively associated with meaning in life (Ward et al., 2022). The third source of meaning in life is creating your own life. Life crafting is seen as an effective way to increase meaning in life (Schippers & Ziegler, 2019). The final source of meaning is meaningful experiences. Meaningful experiences about

the way we feel connected to our life and experiences. The way we can be present in the current moment. It is empirically supported that a feeling of connection towards others and nature is positively associated with meaning in life (Howell et al., 2012; Krause, 2007). During the fourth and fifth sessions, there is also some focus on personal goal setting, which is also associated with increased meaning in life (Schippers, 2017; Travers et al., 2015). These subjects may potentially explain the efficacy of the intervention. However, additional research is needed to precisely delineate the specific components that contribute to the enhancement of meaning in life.

This study has succeeded in replicating the results of the study done by Van Doornik et al. (2023). This is important because this means that the intervention could be a useful addition to the already existing body of evidence-based treatments for patients with eating disorders and further help this group of patients.

Strengths and limitations

One strength of this research is that it is a randomised controlled trial. This ensures internal validity, because of the randomisation that makes certain that the only difference between the intervention group and control group, is whether they received an intervention or not (Saldanha et al., 2022). Next to that, the dropout rate is quite low. Out of 46 participants who received the intervention, only six dropped out (13%). They did this due to various reasons, like not having enough time or having no interest to participate anymore. The dropout rate is lower than compared to CBT, where the dropout rate during ED-treatment is 24% for individual therapist led treatment and 33% for online treatment (Linardon et al., 2018). Although these statistics are based on clients with actual eating disorders, they are still promising because eating disorders in our participants did decrease.

Next to these strengths, this study also has a couple of limitations. As mentioned in the method section, the number of participants is too low to measure a small effect size. Two out

of three of the effects are of large size, so this is not a big problem (Özgür, 2020). It could be one possible explanation to why there was no significant difference for perfectionism. Maybe this effect size is smaller and could be measured if the number of participants was higher. However, it is also possible that there is simply no significant effect.

Next to this, the assumption of homogeneity of regression slopes was not met for all three variables. This means that the results between the intervention group and control group might be overlapping (Johnson, 2016). There are statistical procedures to handle this violation, but these are too complicated for a master thesis of this scope. For now, the results of this study have to be interpreted with caution.

Other than that, the generalizability of this study is somewhat impaired. This is because the participants come from a University of Groningen student sample, where the participants could sign themselves up and receive credits for their participation. The intervention was only tested in a sample of females with high weight- and shape concerns but the effectiveness in a sample that correctly reflects the population of ED patients still needs to be researched (Allmark, 2004).

In the original design of this study, a follow-up questionnaire was sent 4 weeks after the last session. Because of practical reasons, we did not have the ability to include this data in our dataset. So, it is difficult to say anything about the durability of these intervention-effects. The study by Van Doornik et al. (2023) did have significant results for the decrease in eating disorder symptoms at post-assessment. However, the results for meaning in life at post-assessment were not significant, so this is definitely an important part to look into in the future.

A final limitation of this study is that the control group in this study does not receive any treatment at all. In this way, the intervention cannot be compared to other treatments. Also, the effects of the intervention may be less realistic this way because participants that are

placed in the waiting list group are less inclined to change on their own compared to when they would not be on the waiting list (Cunningham, 2013). In this way a treatment can seem more effective than it actually is.

Outlook on future research

This intervention looks promising based on these results. But based on the limitations of this study, a few recommendations for future research arise. The first is to apply this intervention on a larger and more diverse group of participants that also actually suffer from an eating disorder. When we look at the study design, a great strength of this study is the RCT. However, it would be even better to have a RCT that compares this intervention to a treatment that is already in frequent use for eating disorders, like CBT (Kaidesoja et al., 2022), either as an add-on treatment or full replacement of CBT. It is also recommended to look at the long-term effects of this intervention by including data at follow-up points after the intervention is completed.

In conclusion, the Meaning-Centered Intervention may be capable of significantly improve the presence of meaning in life and lower eating disorder symptoms in adolescent women with heightened weight and shape concerns. However, future research is needed to further support this claim and see if the intervention is also capable of increasing meaning in life and reducing eating disorder symptoms in patients with an eating disorder.

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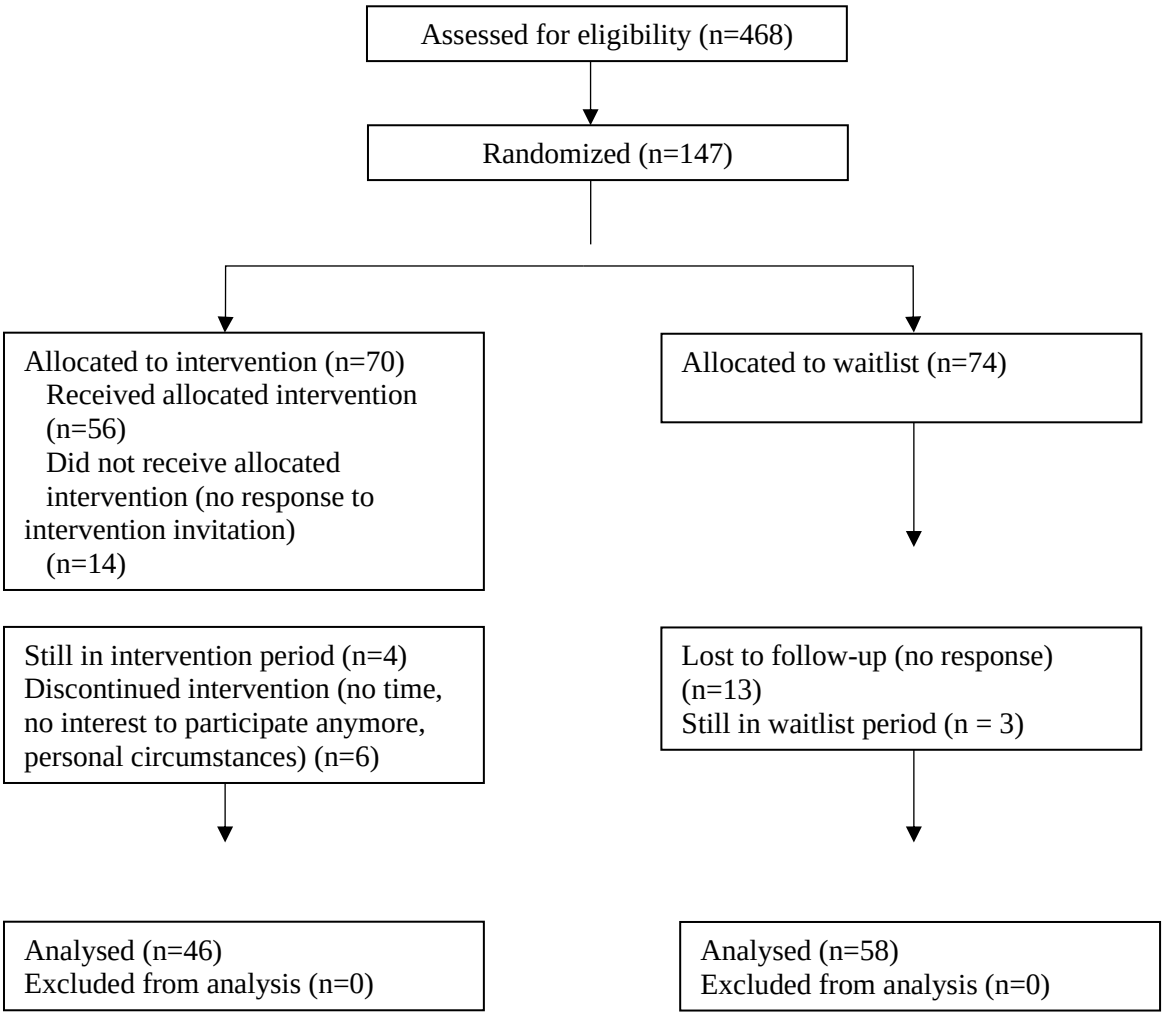
Appendix

Figure 1

Flow chart of participants



Plots for MLQ

Figure 2

Histogram of MLQ post-test intervention group for normality

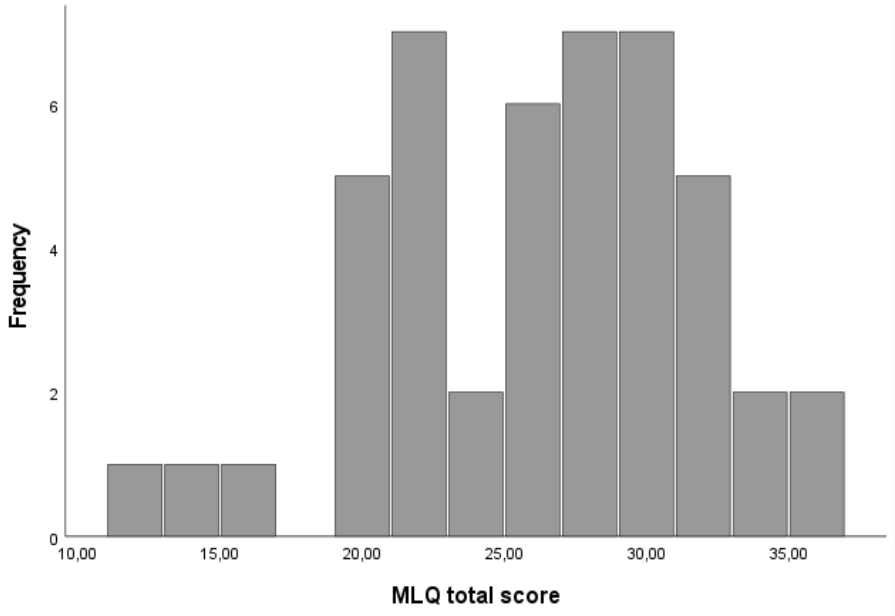


Figure 3

Histogram of MLQ post-test waitlist group for normality

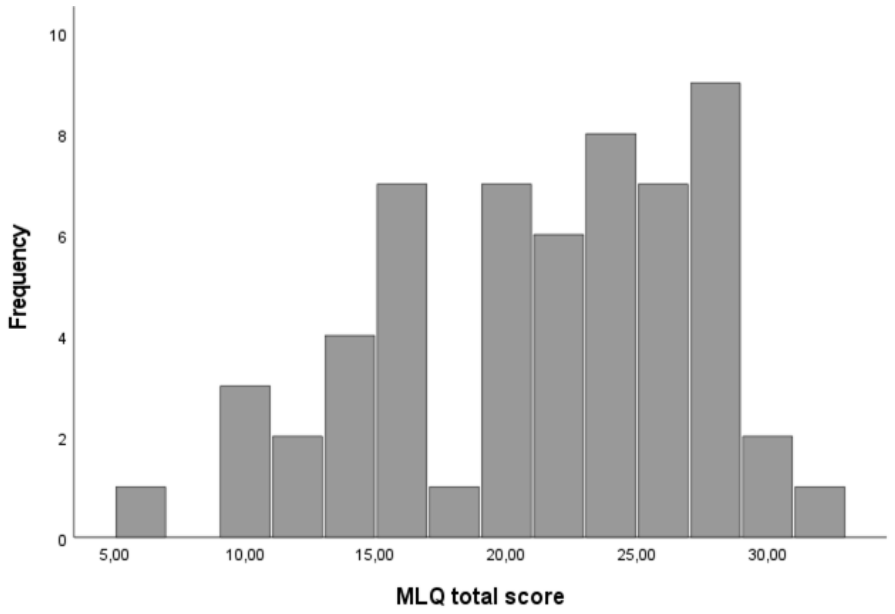


Figure 4

Normal Q-Q plot of MLQ-post-test intervention group for normality

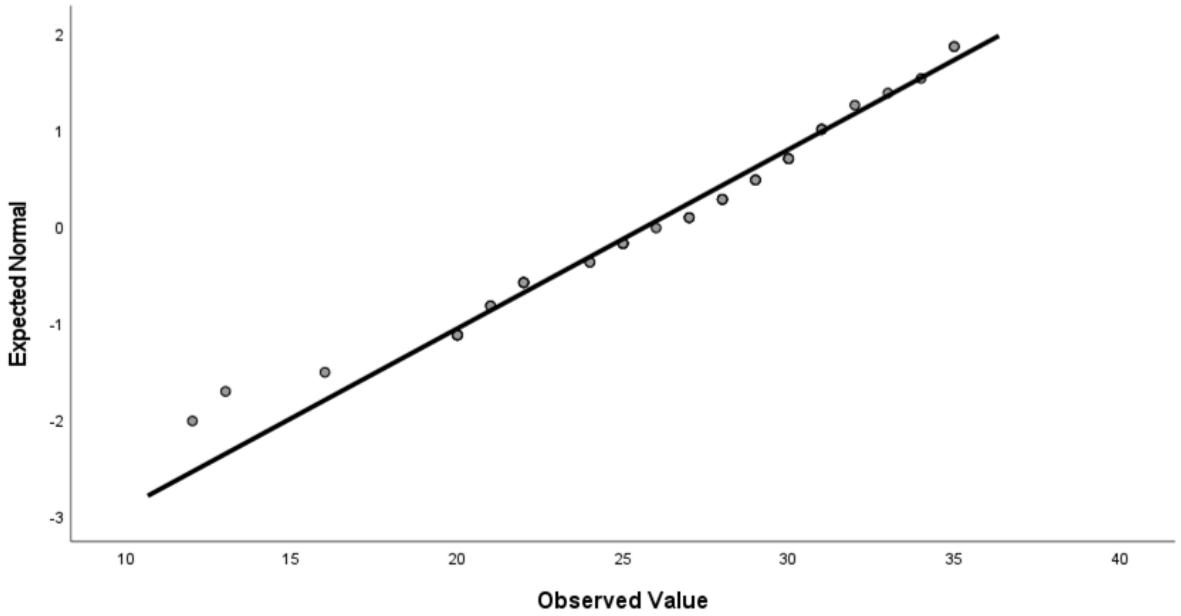


Figure 5

Normal Q-Q plot of MLQ-post-test waitlist group for normality

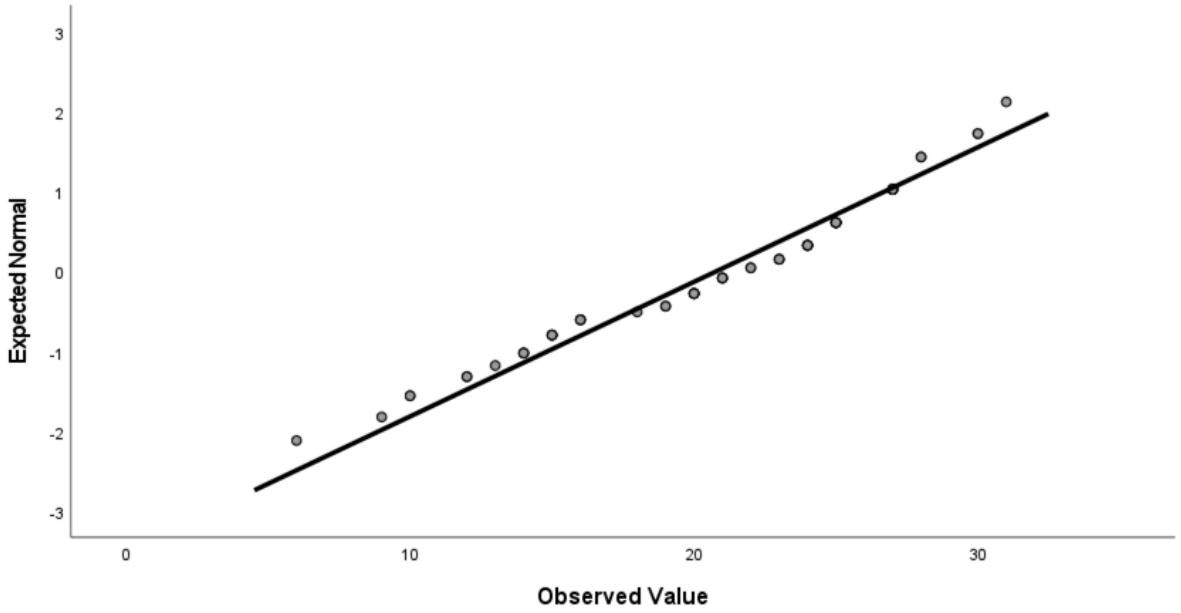


Figure 6

Boxplot of MLQ-post-test for normality

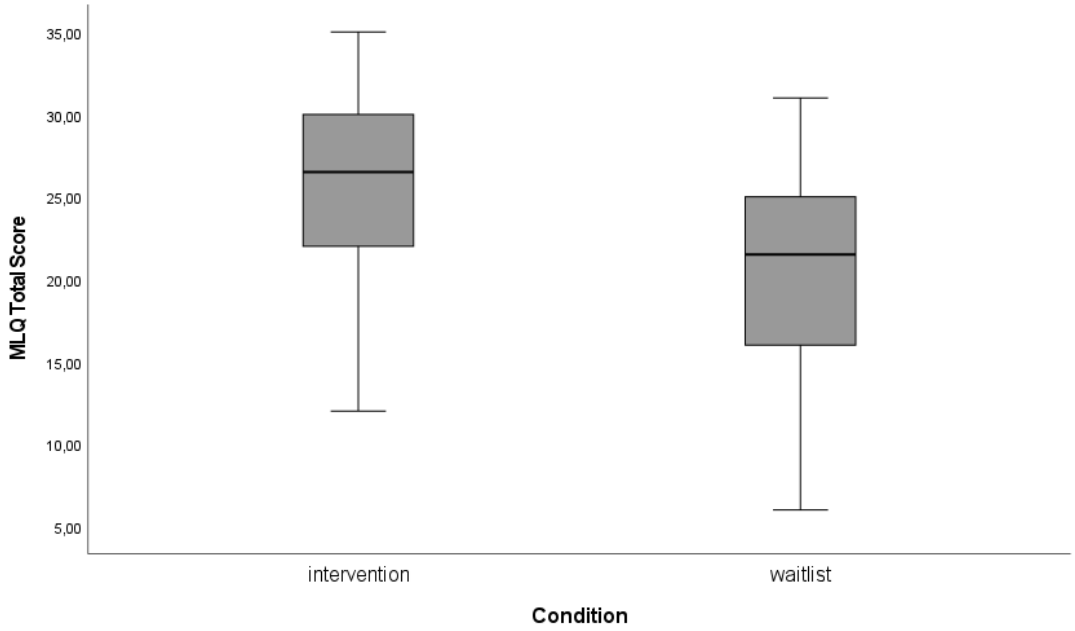
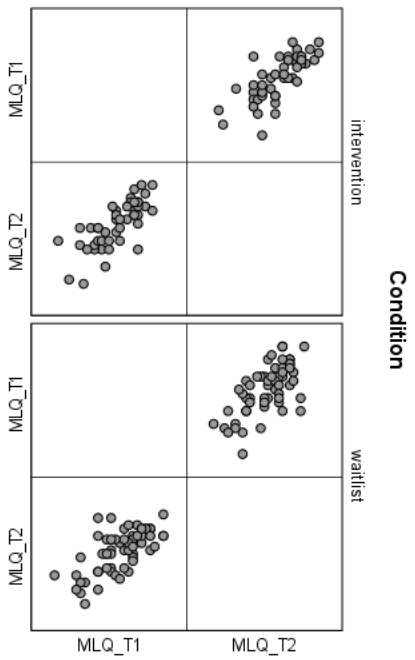


Figure 7

Scatterplot of MLQ-post-test for linearity



Note. MLQ_T1 is the pre-assessment point and MLQ_T2 is the post-assessment point.

Normality plots for EDE-Q

Figure 8

Histogram of EDE-Q post-test for intervention condition for normality

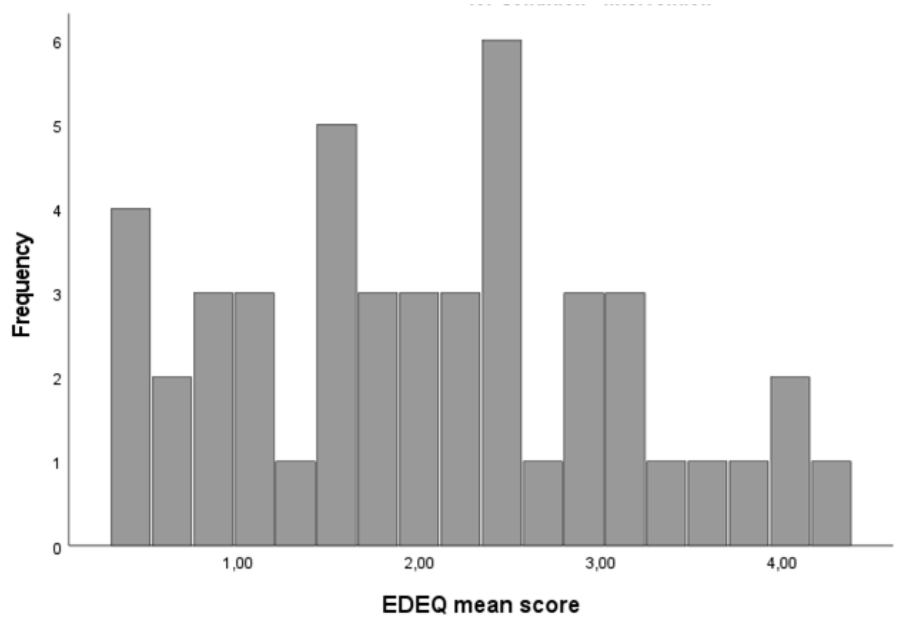


Figure 9

Histogram of EDE-Q post-test for waitlist condition for normality

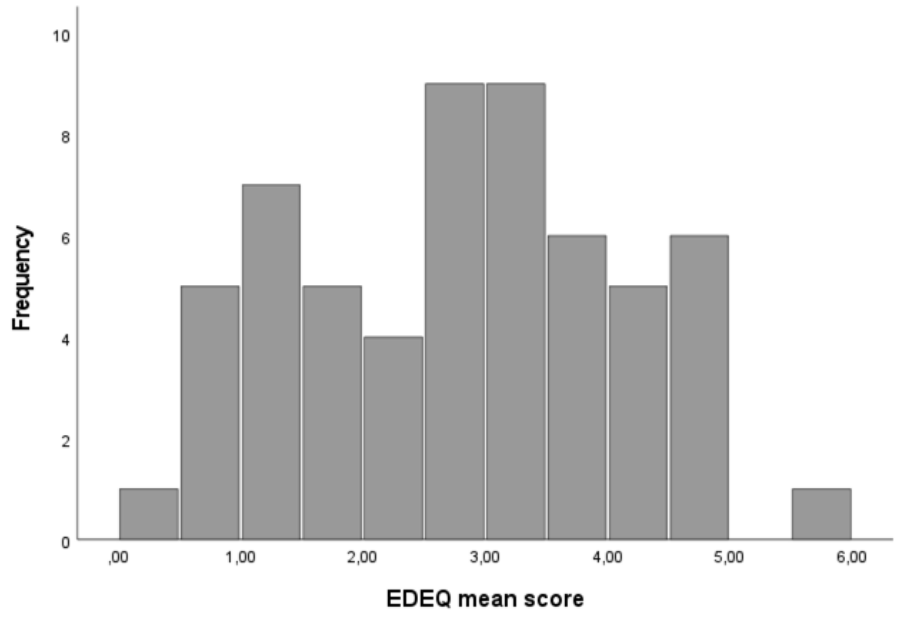


Figure 10

Normal Q-Q plot of EDE-Q post-test for intervention condition for normality

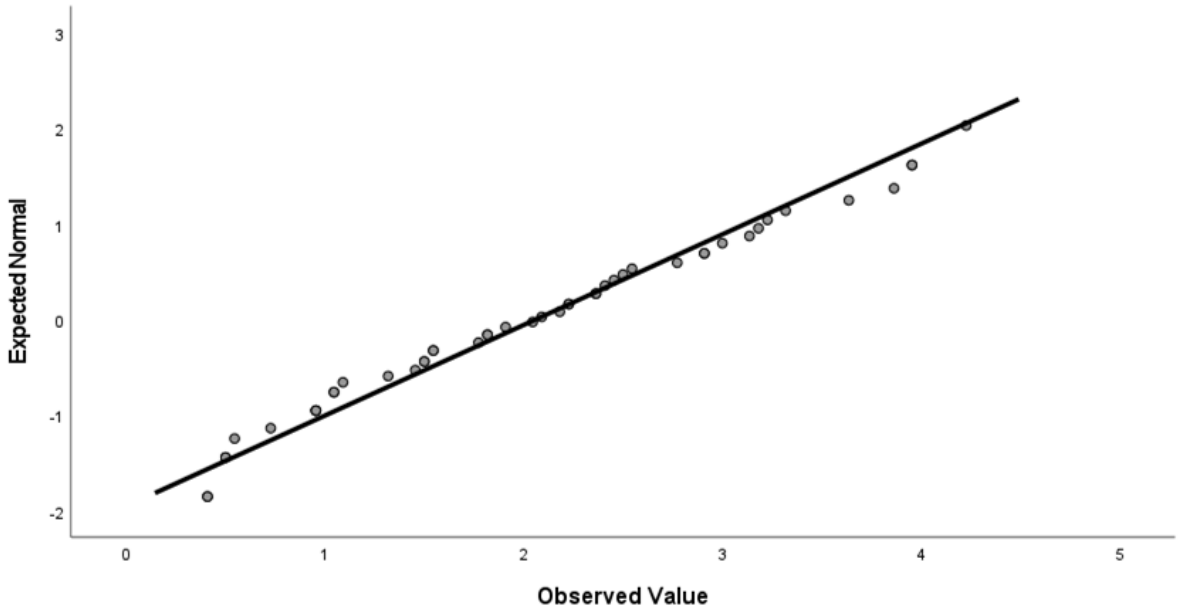


Figure 11

Normal Q-Q plot of EDE-Q post-test for waitlist condition for normality

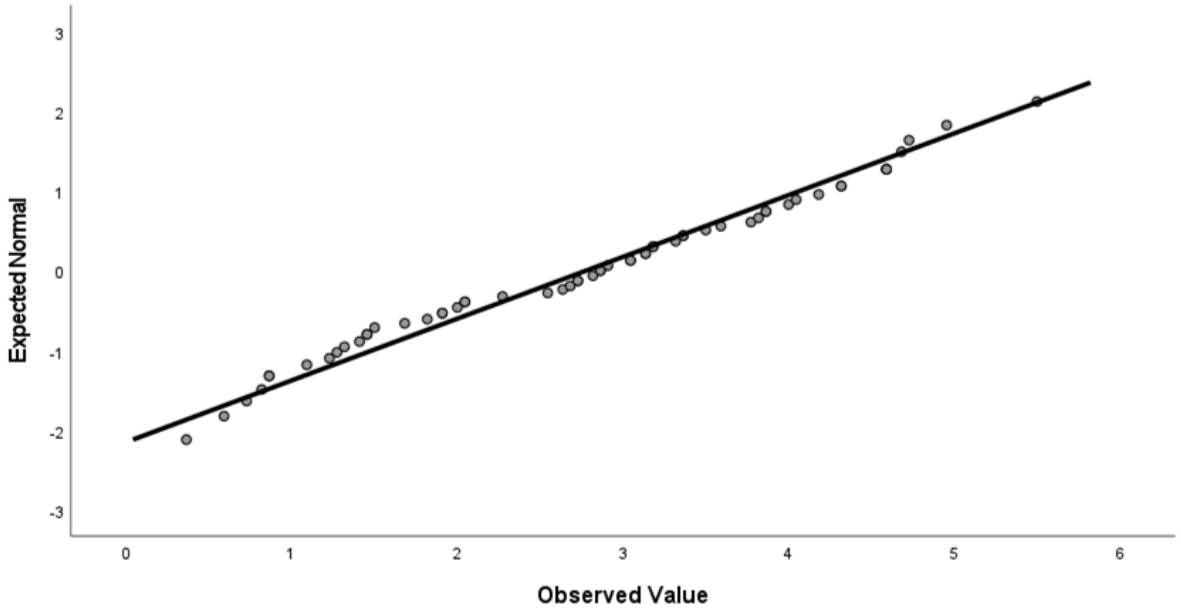


Figure 12

Boxplot of EDE-Q post-test for normality

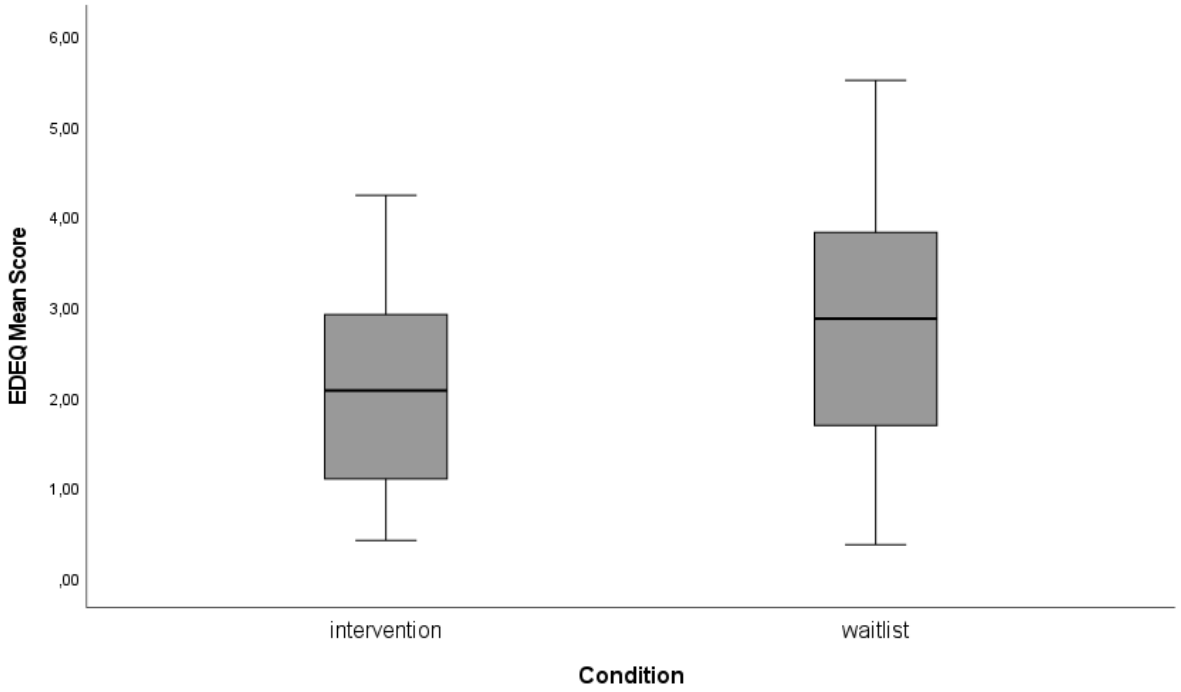
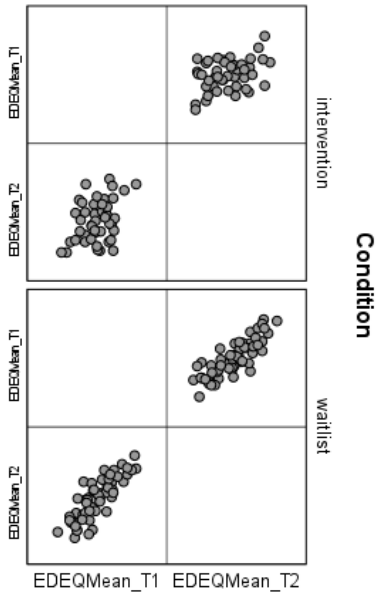


Figure 13

Scatterplot of EDE-Q post-test for linearity



Note. EDEQ_T1 is the pre-assessment point and EDEQ_T2 is the post-assessment point.

Normality plots for CPQ

Figure 14

Histogram of CPQ post-test for intervention condition for normality

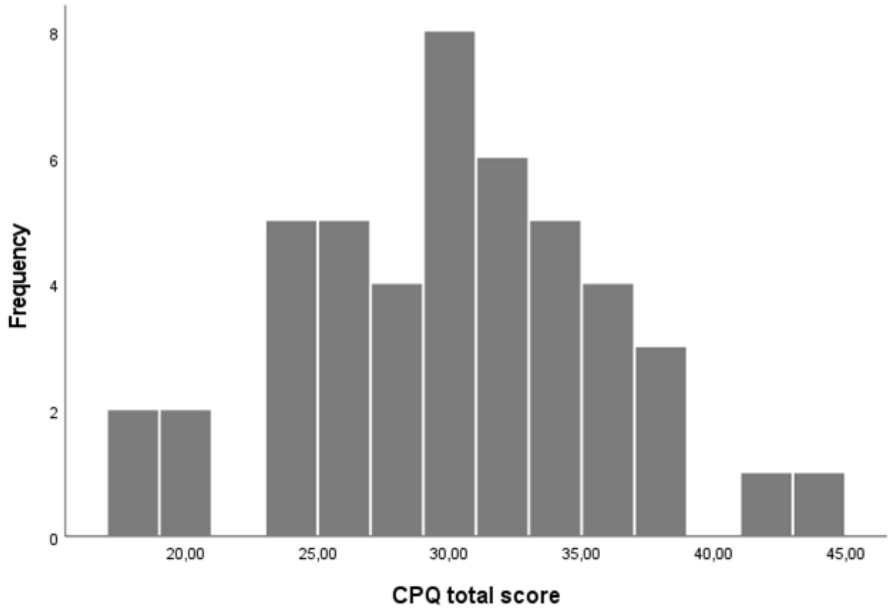


Figure 15

Histogram of CPQ post-test for intervention condition for normality

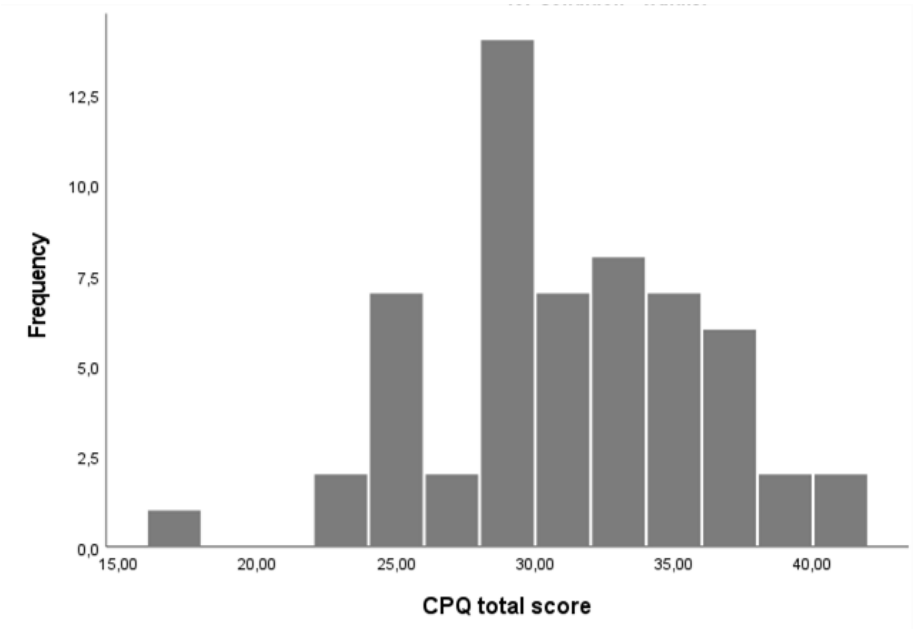


Figure 16

Normality Q-Q plot of CPQ post-test for intervention condition for normality

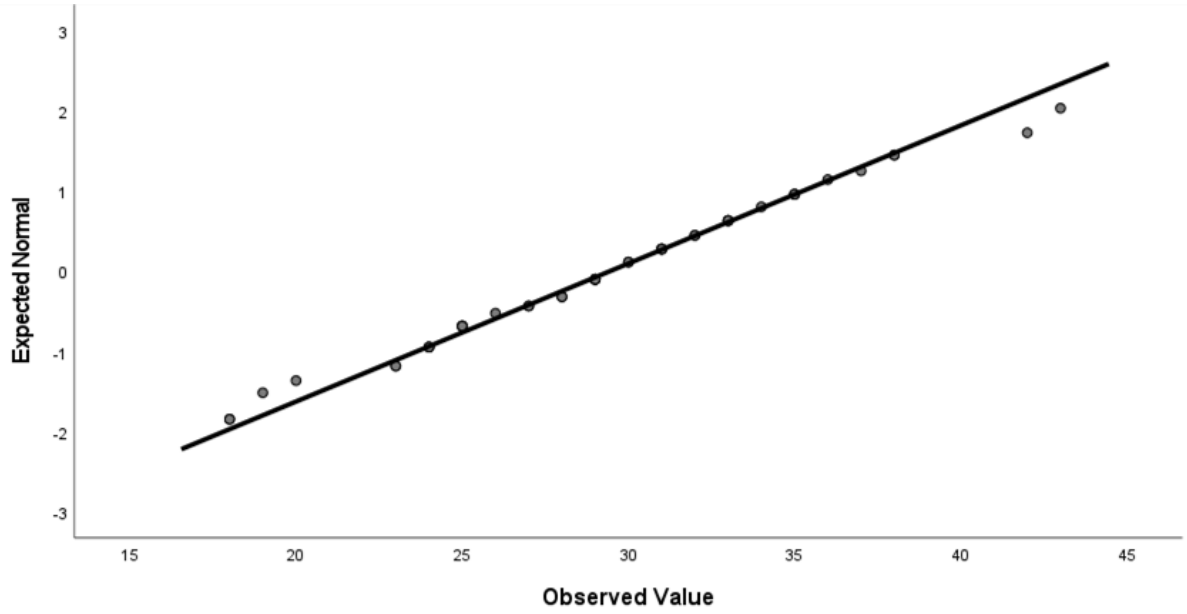


Figure 17

Normality Q-Q plot of CPQ post-test for waitlist condition for normality

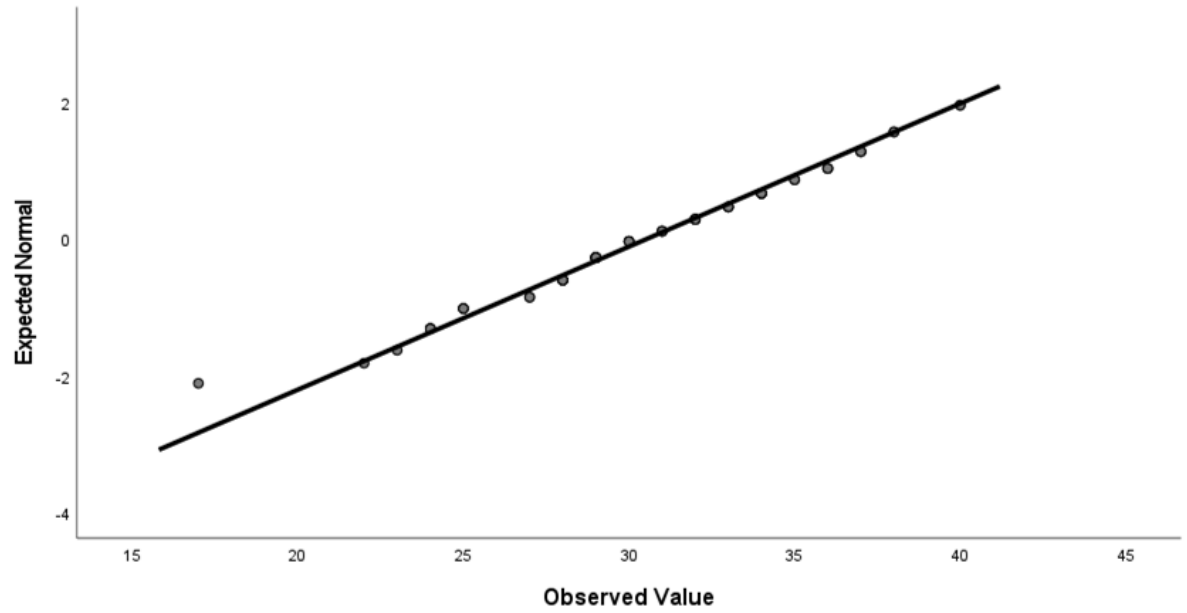


Figure 18

Boxplot of CPQ post-test for normality

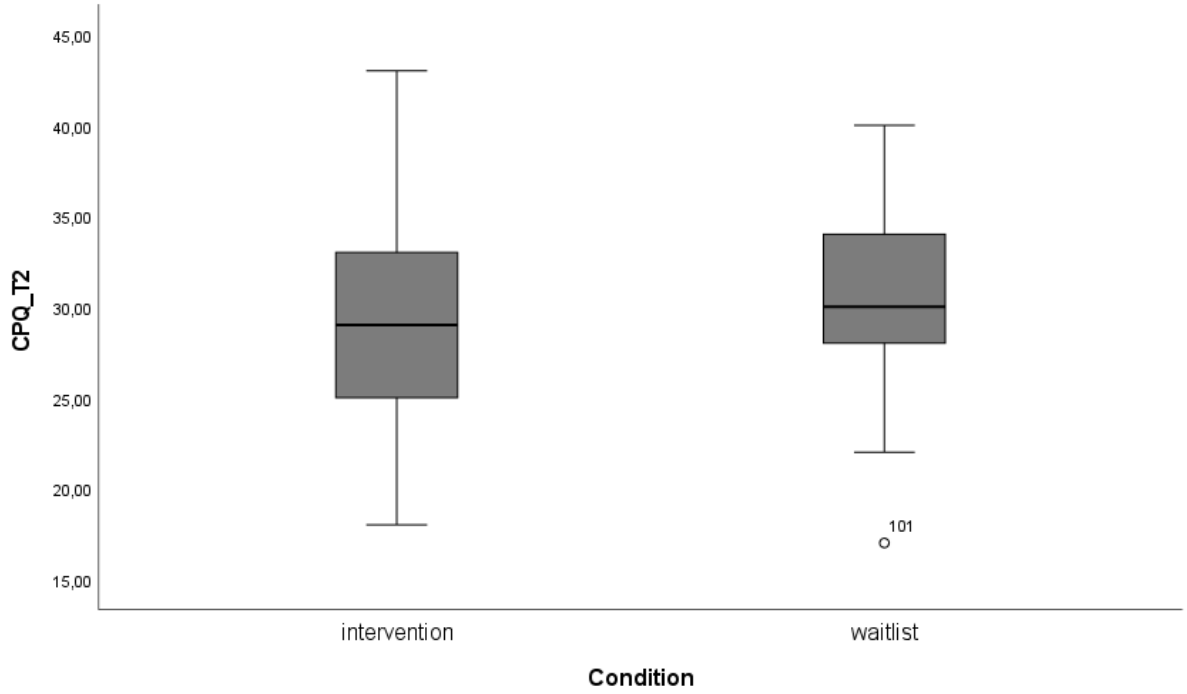
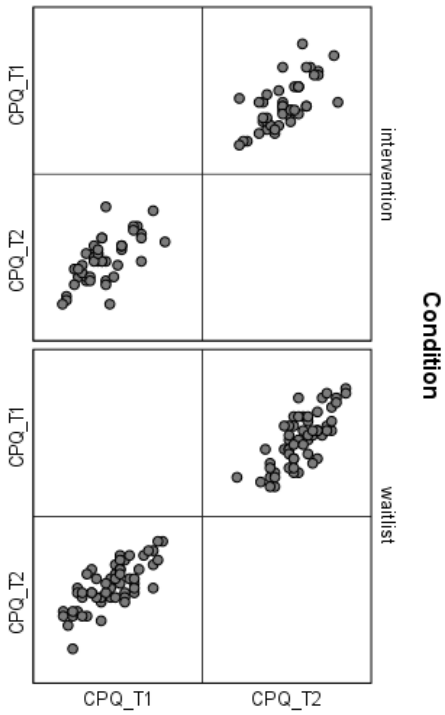


Figure 19

Scatterplot of CPQ post-test for linearity



Note. CPQ_T1 is the pre-assessment point and CPQ_T2 is the post-assessment point.

Tables with assumption checks

Table 3

Shapiro-Wilk test

Variable	Intervention	Waitlist
	p	*p*
MLQ	.193	.049*
EDE-Q	.204	.251
CPQ	.804	.591

Table 4

Homogeneity of regression slopes

Variable	*p*
MLQ	<.001
EDE-Q	<.001
CPQ	<.001

Table 5

Levene's test

Variable	*p*
MLQ	.106
EDE-Q	.059
CPQ	.182

Use of ChatGPT

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 as a way to better the flow of sentences and avoid plagiarism.

Table 6

Input	Output
Change this sentence "Recent theorizing suggests that an overall sense of life meaning consists of the extent to which one's life is experienced as making sense (comprehension), as being directed by one's valued goals (purpose), and as mattering in the world (mattering)"	Current sentence: "Recent theorizing suggests that an overall sense of life meaning consists of the extent to which one's life is experienced as making sense (comprehension), as being directed by one's valued goals (purpose), and as mattering in the world (mattering)." Revised sentence: "Recent theories propose that the overarching sense of meaning in life is determined by how well one's life is perceived as comprehensible, guided by valued goals, and significant in the broader world."
Improve this sentence "Therefore, meaning in life can be seen as a way to treat eating	"Consequently, attributing meaning to life can be regarded as a therapeutic approach

disorder symptoms"	for addressing symptoms of eating disorders."
Improve this sentence "So now that the pandemic is over, it is time to replicate this study and see if the results remain as promising as they have been in the past. "	“With the cessation of the pandemic, there exists an opportune moment to systematically replicate the study, scrutinizing whether the observed results endure with the same level of promise documented in previous investigations."
Improve scientifically "Research has said that high levels of perfectionism are associated with high levels of eating disorder symptoms and that when perfectionism is treated, eating disorder risks are reduced"	"Scientific research has indicated a positive correlation between elevated levels of perfectionism and heightened manifestations of eating disorder symptoms. Furthermore, interventions targeting perfectionism have demonstrated efficacy in mitigating the associated risks of eating disorders."
Improve scientifically "A longitudinal study that included over 1300 participants found that perfectionism was not only a risk factor in the onset of eating disorders, but also predicted the maintenance of these disorders after a 10-year follow-up examination"	"A longitudinal study encompassing more than 1300 participants revealed that perfectionism not only served as a significant risk factor in the initiation of eating disorders but also exhibited predictive value in sustaining these disorders, as evidenced by a comprehensive 10-year

	follow-up examination."
Improve scientifically "For this study, data from a previous study was used."	"In this investigation, data derived from a precedent study served as the foundational dataset."
Improve scientifically "These subjects could potentially explain the effectiveness of the intervention, but further research is needed to accurately conclude which parts actually improve meaning in life."	"These subjects may potentially elucidate the efficacy of the intervention; however, additional research is requisite to precisely delineate the specific components that contribute to the enhancement of meaning in life."
In wetenschappelijk Engels: "de resultaten van dit onderzoek impliceren dat de effectiviteit van de interventie stand houdt na het eindigen van de lockdown periode"	In wetenschappelijk Engels zou je de zin als volgt kunnen formuleren: "The results of this study imply that the effectiveness of the intervention persists after the conclusion of the lockdown period."

Questionnaires used in the data-collection

Meaning in life Questionnaire (MLQ)

The Meaning in Life Questionnaire

MLQ Please take a moment to think about what makes your life feel important to you. Please respond to the following statements as truthfully and accurately as you can, and also please remember that these are very subjective questions and that there are no right or wrong answers. Please answer according to the scale below:

Absolutely Untrue	Mostly Untrue	Somewhat Untrue	Can't Say True or False	Somewhat True	Mostly True	Absolutely True
1	2	3	4	5	6	7

1. ____ I understand my life's meaning.
2. ____ I am looking for something that makes my life feel meaningful.
3. ____ I am always looking to find my life's purpose.
4. ____ My life has a clear sense of purpose.
5. ____ I have a good sense of what makes my life meaningful.
6. ____ I have discovered a satisfying life purpose.
7. ____ I am always searching for something that makes my life feel significant.
8. ____ I am seeking a purpose or mission for my life.
9. ____ My life has no clear purpose.
10. ____ I am searching for meaning in my life.

MLQ syntax to create Presence and Search subscales:
Presence = 1, 4, 5, 6, & 9-reverse-coded
Search = 2, 3, 7, 8, & 10

Eating Disorder Examination Questionnaire (EDE-Q)

Eating Disorder examination questionnaire (EDE-Q 6.0)

Instructions: The following questions are concerned with the past four weeks (28 days) only.

Please read each question carefully. Please answer all the questions. Thank you.

Questions 1 to 12: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days) only.

	ON HOW MANY OF THE PAST 28 DAYS ...	NO DAYS	1-5 DAYS	6-12 DAYS	13-15 DAYS	16-22 DAYS	23-27 DAYS	EVERY DAY
1	Have you been deliberately **trying** to limit the amount of food you eat to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
2	Have you gone for long periods of time (8 waking hours or more) without eating anything at all in order to influence your shape or weight?	0	1	2	3	4	5	6
3	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)?	0	1	2	3	4	5	6
4	Have you **tried** to follow definite rules regarding your eating (for example, a calorie limit) in order to influence your shape or weight (whether or not you have succeeded)?	0	1	2	3	4	5	6
5	Have you had a definite desire to have an **empty** stomach with the aim of influencing your shape or weight?	0	1	2	3	4	5	6
6	Have you had a definite desire to have a **totally flat** stomach?	0	1	2	3	4	5	6
7	Has thinking about **food, eating or calories** made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
8	Has thinking about **shape or weight** made it very difficult to concentrate on things you are interested in (for example, working, following a conversation, or reading)?	0	1	2	3	4	5	6
9	Have you had a definite fear of losing control over eating?	0	1	2	3	4	5	6
10	Have you had a definite fear that you might gain weight?	0	1	2	3	4	5	6
11	Have you felt fat?	0	1	2	3	4	5	6
12	Have you had a strong desire to lose weight?	0	1	2	3	4	5	6

Questions 13-18: Please fill in the appropriate number in the boxes on the right. Remember that the questions only refer to th past four weeks (28 days).

Over the past four weeks (28 days)….

13	Over the past 28 days, how many **times** have you eaten what other people would regards as an **unusually large amount of food** (given the circumstances)?	
14	… On how many of these times did you have a sense of having lost control over your eating (at the time you were eating)?	
15	Over the past 28 days, on how many **DAYS** have such episodes of overeating occurred (i.e. you have eaten an unusually large amount of food **and** have had a sense of loss of control at the time)?	
16	Over the past 28 days, how many **times** have you made yourself sick (vomit) as a means of controlling your shape or weight?	
17	Over the past 28 days, how many **times** have you taken laxatives as a means of controlling your shape or weight?	
18	Over the past 28 days, how many **times** have you exercised in a "driven" or "compulsive" way as a means of controlling your weight, shape or amount of fat, or to burn off calories?	

Questions 19 to 21: Please circle the appropriate number. <u>Please note that for these questions the term "binge eating" means</u> eating what others would regard as an unusually large amount of food for the circumstances, accompanied by a sense of having lost control over eating.

		NO DAYS	1-5 DAYS	6-12 DAYS	13-15 DAYS	16-22 DAYS	23-27 DAYS	EVERY DAY
19	Over the past 28 days, on how many days have you eaten in secret (ie, furtively)? … Do not count episodes of binge eating.	0	1	2	3	4	5	6
		None of the times	A few of the times	Less than half	Half of the times	More than half	Most of the time	Every time
20	On what proportion of the times that you have eaten have you felt guilty (felt that you've done wrong) because of its effect on your shape or weight? … Do not count episodes of binge eating.	0	1	2	3	4	5	6
			Not at all	Slightly	Moderately		Markedly	
21	Over the past 28 days, how concerned have you been about other people seeing you eat? … Do not count episodes of binge eating.	0	1	2	3	4	5	6

Questions 22 to 28: Please circle the appropriate number on the right. Remember that the questions only refer to the past four weeks (28 days).

	ON HOW MANY OVER THE PAST 28 DAYS ...	NOT AT ALL MARKEDLY		SLIGHTLY			MODERATELY	
22	Has your **weight** influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
23	Has your **shape** influenced how you think about (judge) yourself as a person?	0	1	2	3	4	5	6
24	How much would it have upset you if you had been asked to weigh yourself once a week (no more, or less, often) for the next four weeks?	0	1	2	3	4	5	6
25	How dissatisfied have you been with your **weight**?	0	1	2	3	4	5	6
26	How dissatisfied have you been with your **shape**?	0	1	2	3	4	5	6
27	How uncomfortable have you felt seeing your body (for example, seeing your shape in the mirror, in a shop window reflection, while undressing or taking a bath or shower)?	0	1	2	3	4	5	6
28	How uncomfortable have you felt about **others** seeing your shape or figure (for example, in communal changing rooms, when swimming, or wearing tight clothes)?	0	1	2	3	4	5	6

What is your weight at present? (Please give your best estimate.): .....

What is your height? (Please give your best estimate.): .....

If female: Over the past three to four months have you missed any menstrual periods?: **YES** ○ **NO** ○

If so, how many?: ○

Have you been taking the "pill"?: **YES** ○ **NO** ○

Clinical Perfectionism Questionnaire (CPQ)

Deze vragenlijst gaat over perfectionisme, dat wil zeggen, het proberen om aan zeer hoge standaarden te voldoen, ongeacht of je daadwerkelijk succesvol bent in het bereiken van deze standaarden (standaarden over gewicht, uiterlijk of eetgedrag niet meegerekend). Geef bij de volgende stellingen aan in hoeverre deze jou beschrijven in de afgelopen maand.

In de afgelopen maand…

	Helemaal niet 1 (1)	2 (2)	3 (3)	Altijd 4 (4)
1. Heb je jezelf heel erg aangespoord om je doelen te bereiken? (1)	•	•	•	•
2. Was je geneigd om je te focussen op wat je al bereikt hebt in plaats van wat je nog niet bereikt hebt? (2)	•	•	•	•
3. Is je verteld dat je standaarden te hoog liggen? (3)	•	•	•	•
4. Heb je je een mislukkeling gevoeld omdat je niet geslaagd bent in het bereiken van je doelen? (4)	•	•	•	•
5. Ben je bang geweest dat je jouw standaarden mogelijk niet zou bereiken? (5)	•	•	•	•
6. Heb je je standaarden verhoogd omdat je dacht dat ze te makkelijk waren? (6)	•	•	•	•
7. Heb je jezelf beoordeeld op basis van jouw vermogen om hoge standaarden te bereiken? (7)	•	•	•	•
8. Heb je alleen het uiterst noodzakelijke gedaan om te voldoen? (8)	•	•	•	•
9. Heb je herhaaldelijk gecheckt hoe goed je het doet in het bereiken van je standaarden (bijvoorbeeld door het vergelijken van je prestatie met die van anderen)? (9)	•	•	•	•

10.	Denk je dat andere mensen jou als een ‘’perfectionist” beschouwd hebben? (10)	•	•	•	•
11.	Heb je geprobeerd om je standaarden te blijven bereiken, ook als dit betekende dat je dingen bent misgelopen? (11)	•	•	•	•
12.	Heb je elke test gericht op jouw prestatie (in het bereiken van jouw doelen) vermeden omdat de kans bestaat dat je gefaald hebt? (12)	•	•	•	•