The effectiveness of unsupervised online CBT in reducing symptoms of PCBD, depression, and PTSD for people bereaved during the Covid-19-pandemic

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Abstract

Introduction: The Covid-19 pandemic has caused more people to experience the loss of a loved one. Furthermore, because of the increase in unnatural deaths there are more people that experience the loss of a loved one as a traumatic loss. A traumatic loss increases the chance of developing Persistent complex bereavement disorder (PCBD), depression and post-traumatic stress disorder (PTSD). The aim of the current study is to evaluate the effectiveness of unsupervised online cognitive-behavioral therapy (CBT) in reducing symptoms of PCBD, depression, and PTSD for people bereaved during the Covid-19 pandemic.

Method: The current study is a randomized controlled trial (RCT) consisting of an intervention group (n = 19) and a waitlist-control group (n = 32). Participants (N = 52) had lost a family member, friend, or spouse during the Covid-19 pandemic and reported clinically relevant levels of PCBD, depression and/or PTSD. The Traumatic Grief Inventory – Clinician Administered (TGI-CA), Patient Health Questionnaire (PHQ-9) and PTSD Checklist for DSM-5 (PCL-5) were used to assess these clinically significant levels. Participants were assessed with a telephone interview before treatment or waiting period and after treatment or waiting period.

Results: Results showed that unsupervised CBT is effective in reducing symptoms of PCBD ($\eta p2$ = .240*)* and PTSD ($\eta p2$ = .128), but no for reducing symptoms of depression, for people who were bereaved during the Covid-19 pandemic.

Discussion: Unsupervised online CBT could become a cost-effective treatment that is used to help treat bereaved people with clinically significant levels of PCBD and/or PTSD.

Keywords; PCBD, depression, PTSD, RCT, online treatment, CBT

Introduction

In December 2019 the first signs were found of a virus named "Coronavirus disease 2019" (Covid-19) in China. The outbreak of Covid-19 was named a pandemic on the 11th of March 2020 (Ministerie van Algemene Zaken, 2020). As of June 2022, Covid-19 has caused more than six million deaths worldwide (WHO, 2022). In The Netherlands the death toll, from Covid-19, has reached more than 22.000 as of June 2022 (Rijksoverheid, 2022). The loss of a loved one typically results in grief reactions which is seen as a normal emotional reaction after the death of a close person (Diolaiuti et al., 2021). Grief is a mixture between emotional, physiological, cognitive, and behavioral reactions to a loss (Howarth, 2011). To limit the spread of Covid-19 the Dutch government implemented Corona-guidelines (Rijksoverheid, 2022). These guidelines included social distancing, limiting of visitors, and limiting physical contact. These guidelines could have inhibited the mourning of people who lost a loved one during the Covid-19 pandemic. Seeing as, people who followed these guidelines could have been deprived of performing traditional mourning rituals that would've helped them mourn the loss of their loved one (Mortazavi et al., 2021). Furthermore, it became more difficult to mourn together with other people and this caused people to deal with their grief with less social support (Mortazavi et al., 2021). Deprivation of traditional grieving rituals and (physical) social support therefore made it more difficult to deal with the loss of a loved one.

Normal grief reactions can include enduring a period of sorrow, numbness, guilt, anger which slowly reduce as the person who is grieving starts to accept the loss and moves on (Howarth, 2011). These grief reactions usually decrease themselves over time without professional support, but in some cases, these grief symptoms do not reduce and instead become worse. If the grief symptoms continuously worsen, it is disturbed grief and occurs in 5-10% of the people who lose a loved one due to a natural cause (e.g., old age) (Boelen et al., 2018; Lenferink et al., 2022). The chance to develop disturbed grief increases up to 50%

when the loss is due to an unnatural cause (e.g., Illness) (Boelen et al., 2018; Lenferink et al., 2022). Losing a loved one during the Covid-19 pandemic caused some people to feel regret, bewilderment, and shock (Cipolletta et al., 2022). These feelings are characteristics for the first few months after a traumatic loss (Cipolletta et al., 2022). A traumatic loss is an unexpected, or violent, loss of a loved one (Lenferink et al., 2020). A traumatic loss can be more detrimental than a natural loss because it is more likely to cause disturbed grief that can persist for years (Pop-Jordanova, 2021). People who suffer from disturbed grief report severe and disabling grief reactions where clinical attention is warranted (Lenferink et al., 2022).

A diagnosis regarding disturbed grief symptoms is included in the Diagnostic and Statistical Manual of Mental Disorders (DSM-V-TR) (APA, 2022) named persistent complex bereavement disorder (PCBD). People can be diagnosed with PCBD if they meet the following diagnostic criteria; the death of a close person, a disabling yearning for the deceased, 5 or more disabling emotional symptoms, at least six months have passed since the loss, clinically significant social/functioning impairment and it cannot be better accounted for by major depressive disorder (MDD), generalized anxiety disorder (GAD), or post-traumatic stress disorder (PTSD) (APA, 2022). Grief symptoms for PCBD can be intense sorrow, hopelessness, loneliness, and difficulty accepting the death (Aoun et al., 2021). People who suffer from PCBD have an increased risk of developing symptoms of depression, mental and physical health problems, and suicidality (Aoun et al., 2021). A different DSM-V-TR diagnosis for disturbed grief symptoms is prolonged grief disorder (PGD) (APA,2022). PGD includes the following diagnostic criteria for adults; Loss of a loved one that occurred at least one year ago, three emotional/cognitive symptoms that disturb daily life and the bereavement has have lasted longer than what would be considered normal for that person's culture. Moreover, a diagnosis regarding disturbed grief symptoms is included in the ICD-11 and is named prolonged grief disorder (PGD) (World Health Organization, 2019). PGD has the

following diagnostic criteria; death of a close person, most days clinically significant distress 12 months after the death, intense sorrow, preoccupation with the death, persistent/pervasive longing for the deceased, intense emotional pain, time, and impairment persisted for a time that is not considered normal/at least six months, causes significant impairment. The current study focused on PCBD in accordance with DSM-V-TR criteria (APA, 2022).

People who suffer from PCBD can also be diagnosed with major depression disorder (MDD) (Peña-Vargas et al., 2021). A protective factor that protects a person from developing MDD after the loss of a loved one is perceived social support (Peña-Vargas et al., 2021). A person who followed the health Covid-19 guidelines had less social support due to having less interactions with their friends and family (Mortazavi et al., 2021). Therefore, making it more likely that someone would develop depressive symptoms after bereavement during the Covid-19 pandemic. A person who suffers from MDD could have an increased risk of suicidality and an increased risk of health problems (Peña-Vargas et al., 2021).

Lastly, people who suffer from persistent intense grief can be diagnosed with PTSD (Peña-Vargas et al., 2021). A protective factor to reduce the risk of developing PTSD after bereavement is proactive communication between hospital staff and family of the deceased (Ito, 2022). However, during the Covid-19 pandemic the hospital staff was overworked, and hospitals were busier than before the Covid-19 pandemic. This could have resulted in more people developing PTSD after bereavement. The main symptoms of PTSD after bereavement are fear, reexperiencing and hypervigilance (Boelen et al., 2021).

The Covid-19 pandemic is likely to cause an increase in symptoms of PCBD, depression, and PTSD in bereaved people because people are dying because of Covid-19 (i.e., an unnatural cause). The psychological treatment that is most effective for PCBD is face-to-face grief-specific cognitive behavioral therapy (GS-CBT) (Lenferink et al., 2020). However, the Covid-19-pandemic has made face-to-face treatment more difficult or even impossible. To

give proper treatment while following the Covid-19 guidelines, most likely means to downscale treatment where someone must attend physically. This means an alternative way of providing treatment must be used to meet the increased demand for psychological treatment (Feijt et al., 2020). A way to meet this increased demand is online psychological treatment (Feijt et al., 2020). Online psychological treatment has advantages over face-to-face psychological treatment (Bierbooms et al., 2020). These advantages are more flexibility, convenience, and accessibility (Feijt et al., 2020). Furthermore, during the Covid-19 pandemic it is also safer to give treatment online because it helps to lower the risk of people contracting and spreading the Covid-19-virus. Online psychological treatment not only reduces the contact of a client and a healthcare professional, but also removes their time spent commuting towards the appointment and back home. Therefore, limiting contact with other people in multiple ways. Furthermore, online CBT is a cost-effective alternative to physical psychological treatment (Tur et al., 2021).

Even though an evidence based face-to-face GS-CBT exists for the treatment of PCBD, the research into an online version of GS-CBT is lacking (Eisma et al., 2015, Wagner et al., 2006). Research into evaluating the effectiveness of online GS-CBT shows promising results, however not all mental health issues and treatment forms are effective in an online setting (Feijt et al., 2020. Therapist-guided online CBT has shown potential to reduce loss-related distress (Eisma et al., 2015; Wagner et al., 2006). Unsupervised online CBT shows mixed results. The study of Eisma et al. (2015) concluded that online treatment did not show potential in reducing loss-related distress (Eisma et al., 2015). However, the study of van der Houwen et al. (2010) showed promising results in the form of an online treatment where the individual had to do a writing exercise. However, common limitations of these studies were a high drop-out rate, low power, and not a representative population (Eisma et al., 2015; Wagner et al., 2006).

Therefore, the current research aims to answer the following research question: "What is the effectiveness of unsupervised online CBT in reducing symptoms of PCBD, depression, and PTSD for people bereaved during the Covid-19 pandemic compared to a waitlist control group?". Three hypotheses are investigated. Hypothesis 1: "Is unsupervised online CBT effective in reducing symptoms of PCBD in people bereaved during the Covid-19-pandemic relative to people in a waitlist control group after a waiting period?", hypothesis 2: "Is unsupervised online CBT effective in reducing symptoms of depression in people bereaved during the Covid-19 pandemic relative to people in a waitlist control group after a waiting period?", hypothesis 3: "Is unsupervised online CBT effective in reducing symptoms of PTSD in people bereaved during the Covid-19 pandemic relative to people in a waitlist control group after a waiting period?'

Method

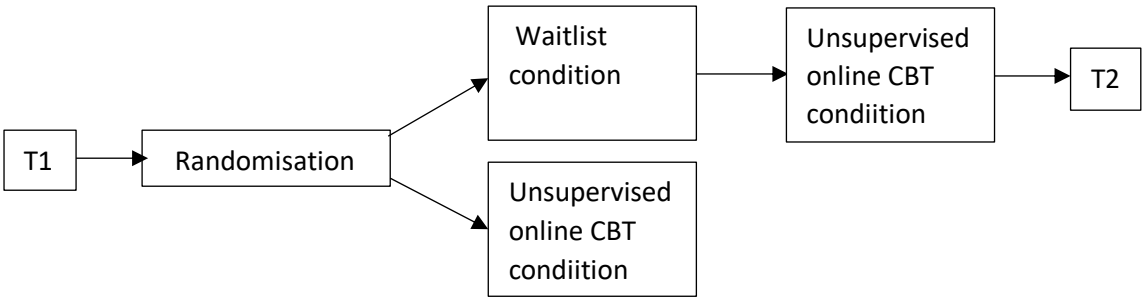
Participants

Participants (N = 52, of which 44 were female and 8 were male) were ≥ 18 years old and reported clinically relevant levels of PCBD, PTSD, and/or depression. Furthermore, the participants lost a family member, friend, or spouse who died (due to corona or otherwise) at least three months earlier during the COVID-19 pandemic (in the period of/or later than March 2020). People who lost a loved one Participants were allowed to receive other types of psychosocial support during participation in the trial. This study was approved by the Medical Ethics Committee at the University Medical Center Utrecht (UMCU) in the Netherlands (NL74518.041.20).

Study design

The current study was a randomized controlled trial (RCT) (as shown in figure 1). Participants were assessed using interviews over the phone before treatment/waiting period (T1) and after treatment/waiting period (T2). Participants were randomly assigned to one of two groups, using a random number generator (www.random.org), after having signed the consent form. Group one was the CBT condition and started with unsupervised online treatment. Group two was the waitlist condition and did not immediately receive treatment. After eight weeks of treatment (group one) or eight weeks of a waiting period (group 2) the participants were assessed again by phone (T2).

Figure 1. Design of the study.



*Note.*T1 = pre-treatment and pre-waiting period T2 = post-treatment and post-waiting period.

Procedure

People who showed an interest in receiving more information about the treatment study would receive an information letter and an informed consent form by mail. After they filled in the informed consent form, a telephone interview at T1 (as shown in figure 1) was planned to screen for eligibility. The interviews were conducted by a trained psychologist who was a member of the research team. The interview took about 30 minutes.

When a person was eligible, then that person was randomized into either the online CBT group or the waitlist group. Results of the randomization were communicated through e-mail or phone. Participants in the online CBT group started the treatment within one week after being allocated. Participants who were allocated to the waitlist control group started with the treatment after eight weeks. Participants in the CBT group were interviewed again after completing the treatment and participants in the waiting group were interviewed again after eight weeks. The interview at T2 (as shown in figure 1) consisted of same questions as used during the interview at T1 without the background and loss-related variables.

When a person was not eligible to participle in the treatment study, this person was referred to a general practitioner. After a month this person was contacted again, if consent was given, by one of the researchers to monitor if that person needed additional support with finding adequate help.

After completing the online CBT, participants could decide if they wanted to continue treatment. If the participant wanted to continue treatment, they were referred to their general practitioner.

Material

Traumatic Grief Inventory – Clinician Administered (TGI-CA)

The Traumatic Grief Inventory – Clinician Administered (TGI-CA; Boelen et al., 2019) was used to assess symptom-levels of PCBD. The TGI-CA was used during interviews and was derived from the Traumatic Grief Inventory-Self report (TGI-SR; Boelen & Smid, 2017). The TGI-CA was comprised of 22 items on a 5-point Likert scale that ranges from 1 = never until 5 = always. An example of an item is “Did you feel sedated in the last month?”. The instruction of the original questionnaire had been changed, to specifically name the timeframe

of the loss of a loved one, to be during the corona pandemic. The psychometric properties of the TGI-CA were adequate (Boelen & Smid, 2017).

Participants were regarded as reporting clinically relevant levels of PCBD when they scored ≥ 3 (= sometimes) on 1, or more, symptoms of criterion B (item 1,2,3, and 14), and 6, or more, symptoms of Criterion C (item 4 up to 11, and 15 up to 18), and endorsed the symptom of criterion D (item 13) and/or reported a total score of ≥ 54 on item 1 through 18 (Boelen et al., 2018).

Patient Health Questionnaire (PHQ-9)

The Patient Health Questionnaire (PHQ-9; Kroenke et al., 2001) was used to assess symptom-levels of depression. The PHQ-9 was comprised of 9 items and participants selected an answer option on a 4-likert scale (0 = not at all until 3 = nearly every day). An example of an item is "Over the last 2 weeks, how often have you been bothered by feeling down, depressed, or hopeless?". The answer options described how often a participant was bothered by each symptom during the past two weeks. The psychometric properties of the PHQ-9 were adequate (Kroenke et al., 2001).

Participants were regarded as reporting clinically relevant levels of major depression when they scored ≥ 10 on the PHQ-9 (Spitzer & Williams, 2001).

PTSD Checklist for DSM-5 (PCL-5)

The PTSD Checklist for DSM-5 (PCL-5) was used to assess symptom-levels of PTSD, which was in accordance with the DSM-5 (APA, 2013), and was comprised of 20 items (Blevins et al., 2015; Boeschoten et al., 2014). The PCL-5 lets participants rate how often they were bothered by each symptom on a 5-point Likert scale (0 = not at all until 4 = extremely). An

example of an item is “In the past month, how much were you bothered by finding it hard to concentrate?”. The wording of the instruction, and the wording of the items, of the original questionnaire was altered to refer to “the death of your loved one(s) during the corona pandemic” instead of “stressful experience?”. The psychometric properties of the PCL-5 were adequate (Blevins et al., 2015).

Participants were regarded as reporting clinically relevant levels of PTSD when they scored ≥ 2 (=moderately) on 1, or more, criterion B item (items 1 until 5), 1 criterion C item (items 6 until 7), 2 criterion D items (items 8 until 14), 2 criterion E items (items 15 until 20), and/or reported a total score of ≥ 31 (Weather et al., 2013).

Treatment

The investigational treatment in the current study was an online grief-specific unsupervised CBT aiming to treat people with clinically relevant levels of distress caused by symptoms of PCBD, PTSD, and/or depression more than three months post- loss during the Covid-19 pandemic. The online unsupervised grief-specific CBT consisted of eight weekly sessions that were tailored to this specific population.

Exposure, cognitive structuring, and behavioral activation are fundamental parts to the unsupervised online grief-specific CBT in accordance with the Dutch guidelines (Boelen & van den Bout, 2017). The treatment started with psychoeducation. The participants were educated about different kinds of emotional reactions to the death of a loved one, during the COVID-19 pandemic, and other processes that might block, or improve, recovery. Psychoeducation was adjusted to fit the treatment population. Sessions 2,3, and 4 were centered around exposure and expression of their loss in detail. Participants were then instructed on how to confront stimuli that would otherwise be avoided. The participants were then educated on what the purpose of the exposure was by describing examples of avoidance that were common for this population. Sessions 5 and 6 were focused on identifying and

changing negative cognitions that stop the participants from adjusting to their loss. In these sessions there was an emphasis on cognitions that relate to responsibility/guilt and fear that could be heightened after losing a loved one during the COVID-19 pandemic (Eisma et al., 2020). In the last sessions the participants were encouraged to try and resume the life they had before their bereavement to experience other situations to correct their current negative behavior.

Participants received the unsupervised online CBT in an online framework via Therapieland. Therapieland is a Dutch company that has vast experience in developing and offering online psychological treatment programs. Treatment is provided via a secure website.

Data analyses

IBM SPSS version 28 (IBM, 2021) was used to analyze the data. Alpha level was set at $\alpha = .05$. First, a randomization check was performed to evaluate possible differences between the online CBT group and waitlist group on T1 symptom levels of PCBD, depression, and/or PTSD. Independent samples T-tests were performed to evaluate this randomization check. With the appointed group (treatment, or waitlist) set as the dependent variable and the T1 symptom levels of PCBD, depression, or PTSD as independent variables. Assumptions for this independent samples T- test were checked (see Appendix A).

To evaluate the effectiveness of the unsupervised online CBT in decreasing PCBD, depression, and PTSD symptom levels, three separate analyses of covariance (ANCOVA) were conducted. Dependent variables were T1 symptom levels of PCBD, depression, or PTSD. The independent variable was the group (waitlist- or intervention). Covariates were baseline symptom levels of PCBD, depression, and PTSD.

Assumptions for conducting the ANCOVAs were checked (see Appendix B, C, and D). The following assumptions were checked: normality, outliers, linearity, independence of the covariate and treatment effect, homogeneity, and homogeneity of regression slopes.

Results

Characteristics of participants

There were 52 participants, 8 male (15%) and 44 female (85%), with an average age of 55 years old. Education of the participants was university level (28, 54%), vocational (35%), and other (11%). The main causes of death of their loved ones were physical illness (n = 35) and Corona (9). 37 Participants had lost 1 person, ten participants had lost two people, and five participants had lost more than two people during the Covid-19 pandemic.

Randomization check

The randomization check was performed to evaluate if there were differences between T1 symptom levels of PCBD, depression, and PTSD between the two groups (waiting, and treatment) (see table 1). The assumptions were checked (Appendix A). The assumption of independence of observations has been checked and met. The assumption of homogeneity of variance has been met for PCBD (A.1), depression (A.2), and PTSD (A.3). The assumption of normality has been met for PCBD (A.1.1), depression (A.2.1), and PTSD (A.3.1). The assumption of outliers has been met for PCBD (A.1.2) and PTSD (A.2.2) however it has not been met for depression (A.3.2).

Treatment effect for PCBD between the intervention and waitlist-control group

Hypothesis 1 tested whether unsupervised CBT was effective in reducing symptoms of PCBD in people bereaved during the Covid-19 pandemic relative to people in a waitlist control group after the waiting period. An ANCOVA was used to test this hypothesis and assumptions were checked (Appendix B) (see table1).

The assumption of normality (B1) and homogeneity of variance (B5) were met. The

assumption of linearity (B3 and B3.1) was met with the covariate of T1 symptom levels but was not met with the covariate of professional help. The assumption of homogeneity of regression slopes (B4 and B4.1) was met with the covariate of professional help but was not met with the covariate of T1 PCBD symptom levels. The assumption of outliers (B2) was not met.

The results of the covariate analyses showed that there was a significant relationship between the covariate T1 PCBD symptom-levels of the two groups and PCBD symptom levels at T2 $F\ (1, 46) = 46.38$, $p = <.001$, $\eta p^2 = .502$. Results showed that there was no significant relationship between the covariate additional professional psychological help and T2 PCBD symptom levels $F\ (1, 46) = 1.144$, $p = .290$, $\eta p^2 = .024$.

Results of the ANCOVA showed that the group placement had a significant effect on T2 PCBD symptom levels while adjusting for the covariates T1 PCBD symptom-levels and additional professional psychological help $F\ (1, 46) = 14.53$, $p = <.001$, $\eta p^2 = .240$

Treatment effect for depression between the intervention and waitlist-control group

Hypothesis 2 tested whether unsupervised CBT was effective in reducing symptoms of depression in people bereaved during the Covid-19 pandemic relative to people in a waitlist control group after the waiting period. An ANCOVA was used to test this hypothesis and assumptions were checked (Appendix C) (see table 1).

The assumption of homogeneity of variance was met (C5). The assumption of linearity (C3 and C3.1) was met with the covariate of T1 symptom levels but was not met with the covariate of professional help. The assumption of homogeneity of regression slopes (C4 and C4,1) was met with the covariate of professional help but was not met with the covariate of T1 symptom levels. The assumptions of outliers (C2) and normality (C1) were not met.

Results of the covariate analyses showed that there was a significant relationship between the covariate T1 depression symptom-levels of the two groups and depression

symptom-levels at T2 F (1, 47) = 32.53, p = <.001, ηp² = .409.

The results of the ANCOVA showed that there was no significant relationship with additional professional psychological help and T2 depression symptom-levels F(1, 47) = 3.75, *p* = .059, ηp² = .074.

The results of the ANCOVA also showed that the group placement did not have a significant effect on T2 depression symptom-levels while adjusting for the covariates T1 depression symptom-levels and additional professional psychological help F (1, 47) = 3.599, *p* = .064.

Treatment effect for PTSD between the intervention and waitlist-control group.

Hypothesis 3 tested whether unsupervised CBT was effective in reducing symptoms of PTSD in people bereaved during the Covid-19 pandemic relative to people in a waitlist control group after the waiting period. An ANCOVA was used to test this hypothesis and assumptions were checked (Appendix D) (see table 1).

The assumption of normality (D1), outliers (D2), and homogeneity of variances (D5) were met. The assumption of linearity (D3 and D3.1) was met with the covariate of T1 symptom levels but was not met with the covariate of professional help. The assumption of homogeneity of regression slopes (D4 and D4.1) was met with the covariate of professional help but was not met with the covariate of T1 symptom levels.

Results of the covariate analyses showed that there was a significant relationship between the covariate T1 PTSD symptom-levels of the two groups and PTSD symptom levels at T2 F (1, 46) = 31.91, p = < .001, *ηp² = .410*. Results showed that there was no significant relationship between the covariate additional professional psychological help and T2 PTSD symptom-levels F (1, 46) = 2.487, *p* = .122, ηp² = .051.

The results of the ANCOVA showed that the group placement had a significant effect on T2 PTSD symptom levels while adjusting for the covariates T1 PTSD symptom-levels and

additional professional psychological help $F(1, 46) = 6.72$, $p = .010$, $\eta p^2 = .128$.

Table 1. Descriptive statistics

	Intervention group (n = 19)	Waitlist-control group (n = 33)
T1 PCBD, M, (SD)	52.79 (8.05)	48.27 (10.13)
T2 PCBD, M, (SD)	39.33 (9.29)	44.78 (11.34)
T1 depression, M, (SD)	14.00 (4.08)	13.61 (4.51)
T2 depression, M, (SD)	9.42 (5.29)	11.38 (4.89)
T1 PTSD, M, (SD)	39.05 (10.50)	35.73 (12.74)
T2 PTSD, M, (SD)	23.44 (12.84)	29.88 (15.29)

Note. PCBD = persistent complex bereavement disorder. PTSD = post-traumatic stress disorder. T1 = assessment before treatment/waiting period. T2 = assessment after treatment/waiting period. M = mean. SD = standard.

Discussion

This research was conducted to evaluate the effectiveness of unsupervised online CBT in reducing symptoms of PCBD, depression, and PTSD for people bereaved during the Covid-19 pandemic. Three hypotheses were formulated to answer this research question. Hypothesis 1 stated that unsupervised online CBT was effective in reducing symptoms of PCBD in people bereaved during the Covid-19 pandemic relative to people in a waitlist control group after the waiting period. Results showed that unsupervised online CBT is an effective treatment to reduce symptoms of PCBD in people bereaved during the Covid-19 pandemic relative to a waitlist-control group after a waiting period. Therefore, hypothesis one was accepted. This result is in line with similar research, as shown in the meta-analysis of Wagner et al. (2020), showing that online CBT for bereaved people is effective in reducing PCBD symptoms.

Hypothesis two stated that unsupervised online CBT was effective in reducing

symptoms of depression in people bereaved during the Covid-19 pandemic relative to people in a waitlist control group after the waiting period. Results showed that the unsupervised online CBT was not effective to reduce symptoms of depression in people bereaved during the Covid-19 pandemic relative to a waitlist-control group after waiting period. Therefore, hypothesis two was rejected. This result is unexpected as the meta-analysis, that researched the effectiveness of online CBT for bereaved people with depression symptoms, found a small effect for reducing depression symptoms (Wagner et a., 2020). However, Wagner et al. (2020) stated that individual feedback, from a mental healthcare worker supervising treatment, increased the treatment effects for depression. This positive treatment effect for depression most likely did not occur in the current research seeing as it was an unsupervised treatment.

Hypothesis three stated that unsupervised online CBT was effective in reducing symptoms of PTSD in people bereaved during the Covid-19 pandemic relative to people in a waitlist control group after the waiting period. The results showed that the unguided online CBT was effective in reducing symptom levels of PTSD relative waitlist-control group after a waiting period. Therefore, hypothesis three was accepted. This result is in line with similar research, as shown in the meta-analysis of Wagner et al., 2020), that showed that online CBT for bereaved people is effective in reducing PTSD symptoms.

Strengths of the current study

The current study was the first RCT that evaluated unsupervised online bereavement treatment for people who lost a loved one during the Covid-19 pandemic. Therefore, the current research adds more evidence for the effectiveness of unsupervised online CBT. Moreover, the current study included a waitlist-control group so people who got placed in the waitlist-control group still got treatment after a waiting period. Furthermore, the current research used interviews to evaluate symptom-levels. Interview-based assesments are more

reliable than self-report assesments in evaluating psychopathology (Boelen & Smit, 2017).).

Limitations

The limitations of the current study were that the sample size may have been too limited to find an effect of unsupervised online CBT in treating depression symptoms. A meta-analysis on online CBT treatment by Wagner et al. (2020) found a small effect for depression. However, the systematic literature study of Wagner et al. (2020) had significantly (N = 1257) more participants and likely more power, which may mean that the current study did not have enough power to show an effect. Furthermore, even though the unsupervised online CBT was effective in reducing PCBD and PTSD symptoms, it is unclear what the underlying mechanisms of change were. Lastly, there is an overrepresentation of women in the current study as 85% of the participants were women. Therefore, making it more difficult to evaluate what the effects of unsupervised online CBT are on men who are bereaved. However, this overrepresentation of women is in line with other similar studies (Wagner et al., 2020; Lenferink et al., 2021).

Suggestions for future research

Future research should be conducted to evaluate underlying mechanisms of change responsible associated with treatment effectiveness may help in improve online CBT. Furthermore, it is important to research the long-term effects of the current unsupervised online CBT. Research is also needed to evaluate whether there are differences in effectiveness of unsupervised online CBT, and supervised online CBT, for people who are bereaved.

Clinical implications

The aim of the current study was to evaluate the effectiveness of unsupervised online CBT in reducing symptoms of PCBD, depression, and PTSD for people who were bereaved during the Covid-19 pandemic. By increasing and improving the knowledge of the effectiveness, the current limits, and the areas of improvement of (unsupervised) online CBT, for treating bereavement, the treatment and the amount of people that can receive that treatment in the future can be improved. Furthermore, the current research adds more evidence for the effectiveness of unsupervised online treatments and online treatments in general. This is important because online unsupervised CBT is more cost-effective than face-to-face CBT (Stavropoulos, 2019). Therefore, making it more accessible for people who need treatment when it is not possible to meet face-to-face.

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Appendix A

Assumptions for independent samples T-test for baseline symptom differences between groups for PCBD, depression, and PTSD.

A.1

Test of Homogeneity of Variance for baseline PCBD

	Levene's Test			
T1 baseline	F	df	df 2	Sig.
TGI-CA	.73	1	50	.10

Note. p>.05. Independent variable = condition of the group. Dependent variable = T1 symptom levels of PCBD.

The p>.05 and this means that the assumption of homogeneity of variance is met.

A.1.1

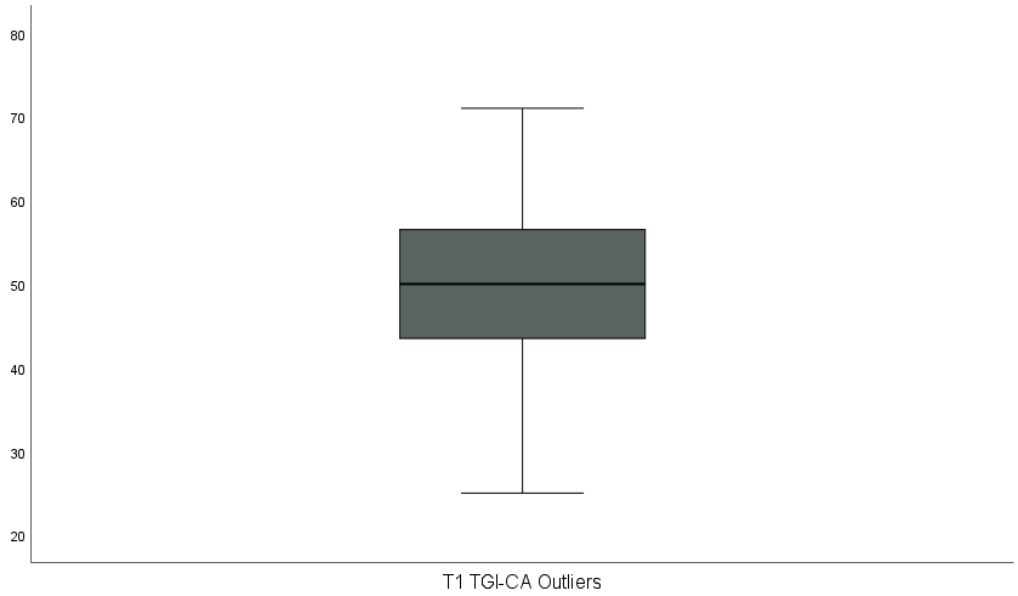
	Shapiro-Wilk		
T1 baseline	Statistic	df	Sig.
TGI-CA	.99	52	.86

Note. p>.05. Independent variable = condition of the group. Dependent variable = T1 symptom levels of PCBD.

The p>.05 and this means that the assumption of normality is met.

A1.3

Test for outliers boxplot



There were no outliers and therefore the assumption for outliers has been met.

A.2

	Levene's Test			
T1 baseline	F	df	df 2	Sig.
PHQ9	.01	1	50	.76

Note. p>.05. Independent variable = condition of the group. Dependent variable = T1 symptom levels of PHQ9.

The p>.05 and this means that the assumption of homogeneity of variance is met.

A.2.1

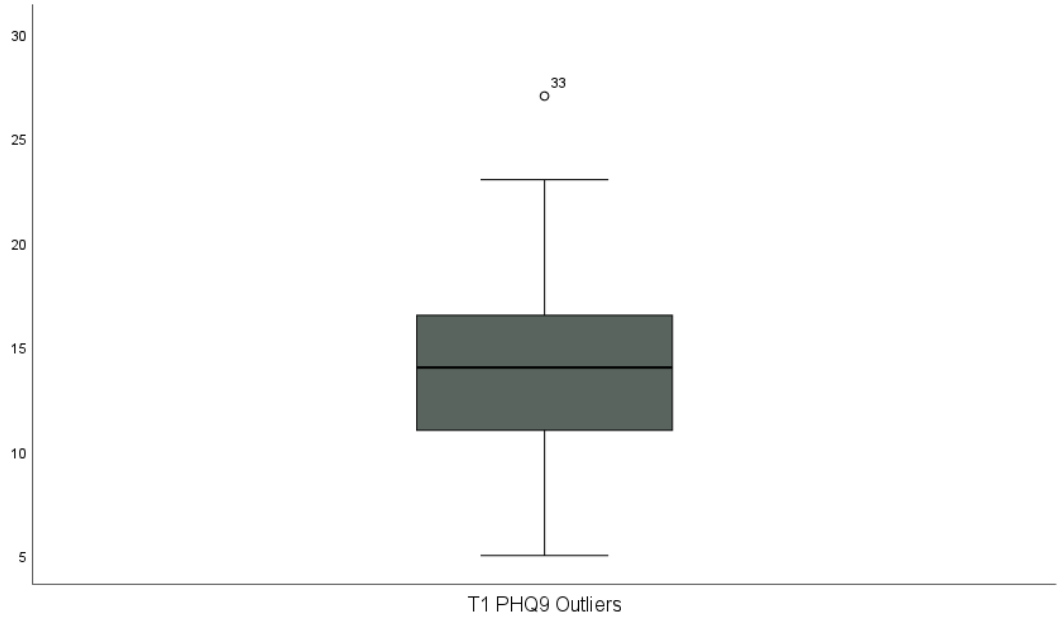
	Shapiro-Wilk		
T1 baseline	Statistic	df	Sig.
PHQ9	.98	52	.34

Note. p>.05. Independent variable = condition of the group. Dependent variable = T1 symptom levels of PHQ9.

The p>.05 and this means that the assumption of normality is met.

A2.2

Test for outliers boxplot



There was an outlier and therefore the assumption for outliers has not been met. However, the score looks to be valid and therefore will remain.

A.3

	Levene's Test			
T1 baseline	F	df	df 2	Sig.
PCL5	.50	1	50	.34

Note. p>.05. Independent variable = condition of the group. Dependent variable = T1 symptom levels of PCL5.

The p>.05 and this means that the assumption of homogeneity of variance is met.

A.3.1

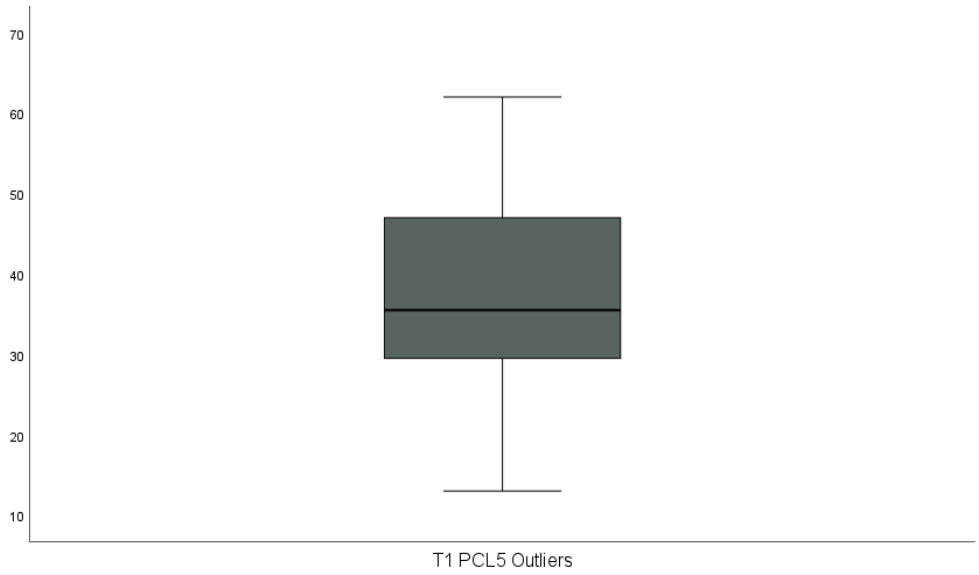
	Shapiro-Wilk		
T1 baseline	Statistic	df	Sig.
PCL5	.98	52	.44

Note. p>.05. Independent variable = condition of the group. Dependent variable = T1 symptom levels of PCL5.

The p>.05 and this means that the assumption of normality is met.

A3.2

Test for outliers boxplot



There were no outliers and therefore the assumption for outliers has been met.

Appendix B

The assumption checks for the ANCOVA for PCBD.

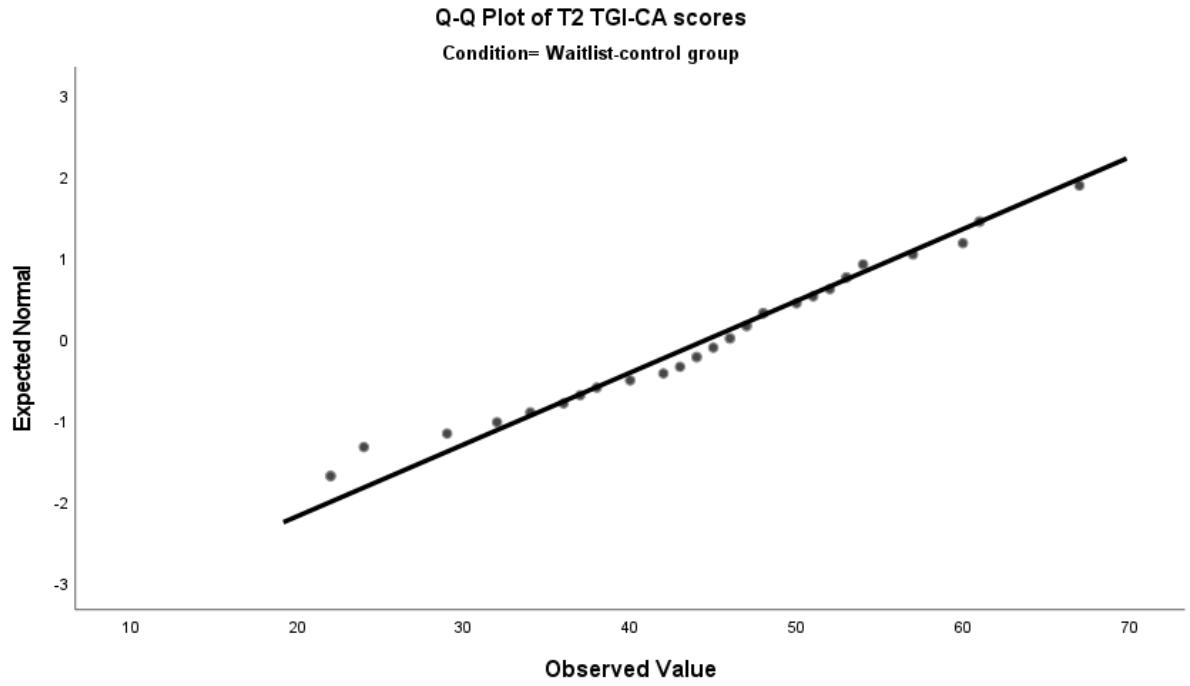
B1

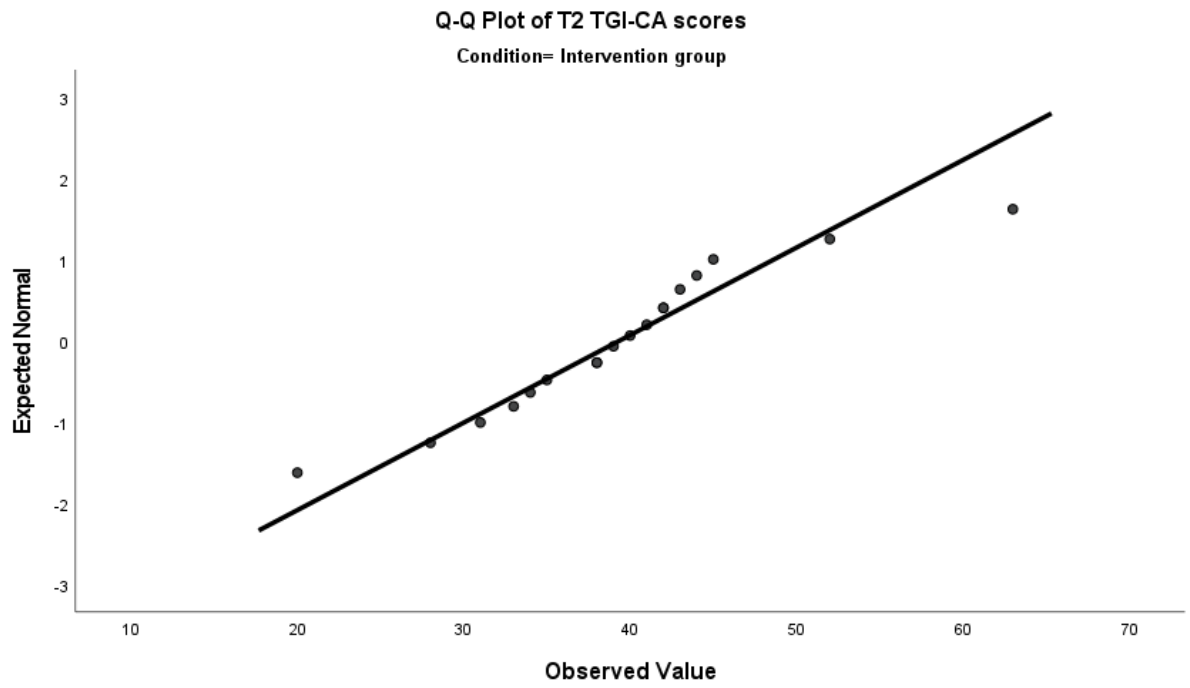
Test for normality

	Shapiro-Wilk		
	Statistic	df	Sig.
Intervention group	.10	32	.60
Waitlist-control group	.16	18	.46

P>.05 and therefore the assumption of normality has been met.

B1.1

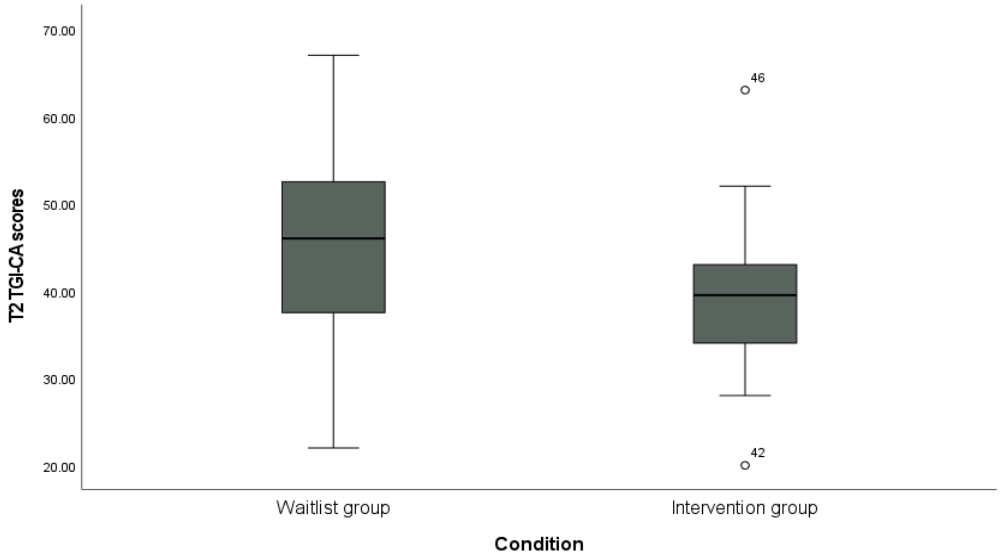




These plots show that there was minimal diverting and adds evidence that the assumption for normality has been met.

B2

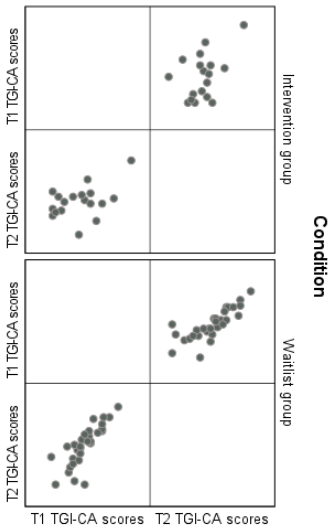
Test for outlier



There were outliers in the intervention group. Therefore, the assumption of no outliers has not been met. They will remain in the analyses, but the results should be interpreted cautiously.

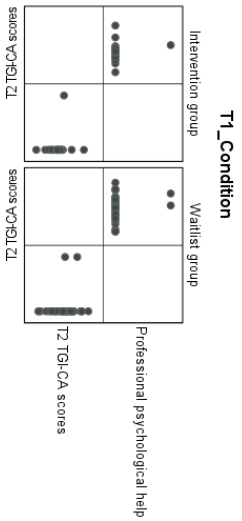
B3

Test for linearity



The dependent variable = condition. The independent variable = baseline PCBD scores. The assumption of linearity has been met.

B3.1



The dependent variable = condition. The independent variable = professional psychological help. The assumption of linearity has not been met.

B4

Test for homogeneity of regression slopes for baseline symptom levels

	Test of Between-Subjects Effects		
	F	df	Sig.
Condition x baseline PCBD symptom levels	28.05	2	<.001

P>.05 and therefore the assumption of homogeneity of regression slopes for baseline symptom levels has not been met.

B4.1

Test for homogeneity of regression slopes for professional psychological help

	Test of Between-Subjects Effects		
	F	df	Sig.
Condition x Professional psychological help	.68	2	.51

P<.05 and therefore the assumption of homogeneity of regression slopes for professional psychological help has been met.

B5

Test for homogeneity of variances

Levene's test			
F	df 1	df 2	Sig.
.60	1	48	.44

P<.05 and therefore the test for homogeneity of variances has been met.

Appendix C

The assumption checks for the ANCOVA for depression

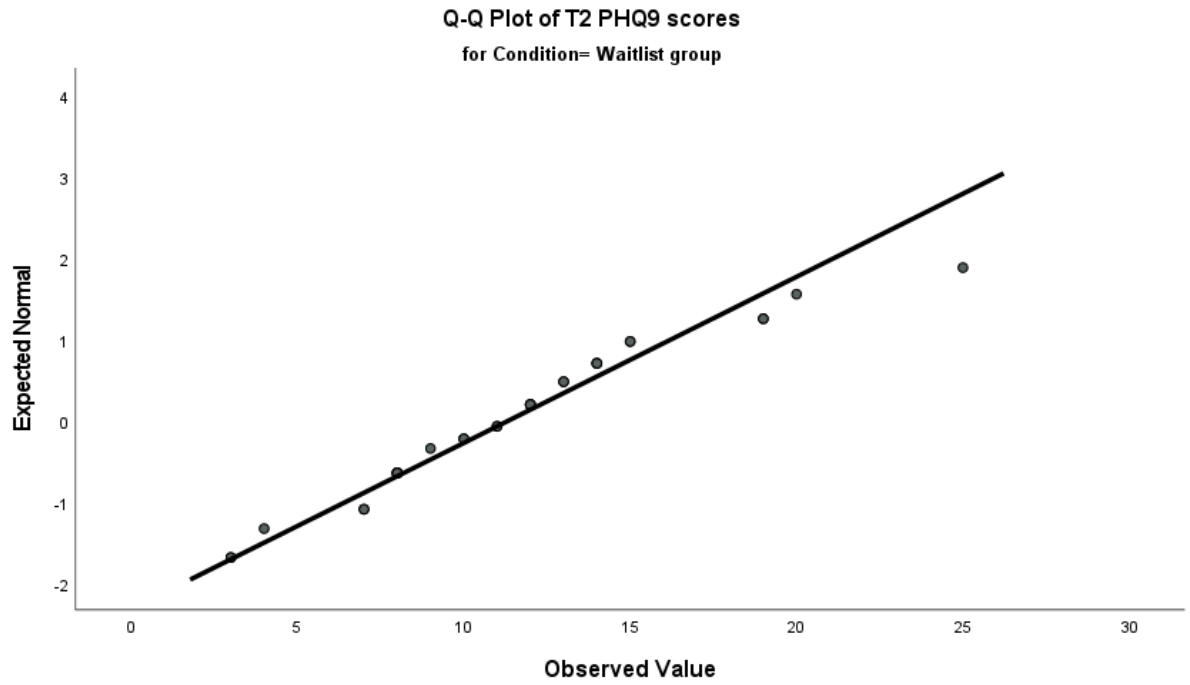
C1

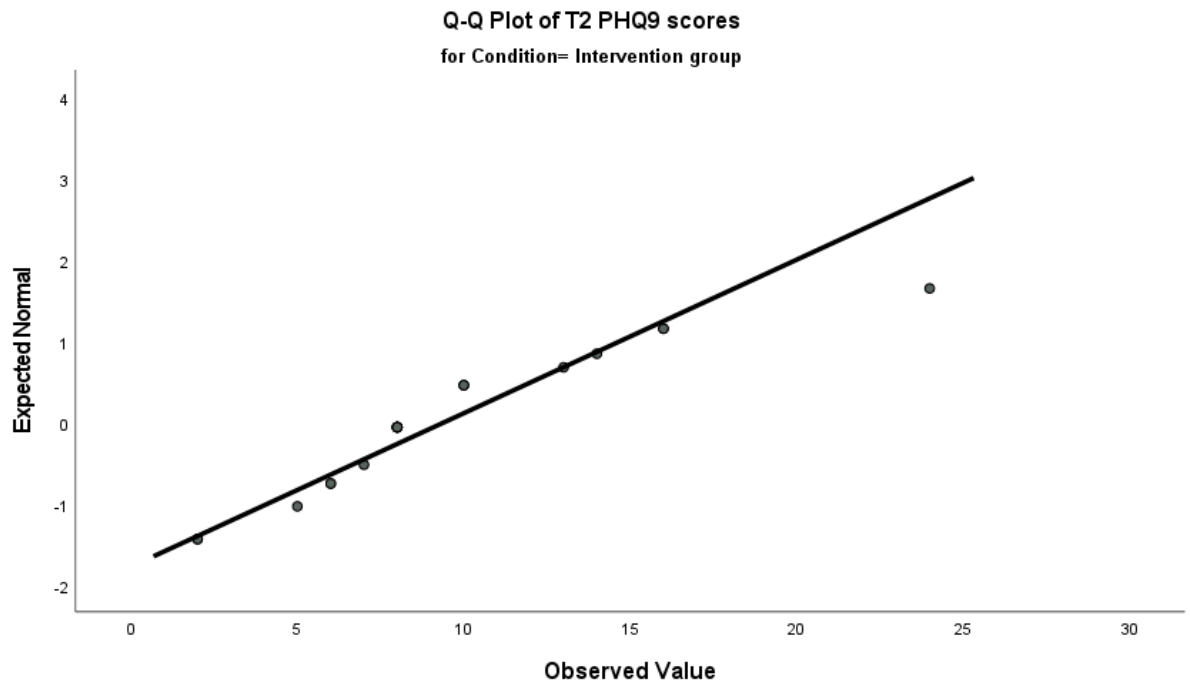
Test for normality

	Shapiro-Wilk		
	Statistic	df	Sig.
Intervention group	.11	32	.18
Waitlist-control group	.24	19	.04

P<.05 for the waitlist-control group. Therefore, the assumption of normality has not been met.

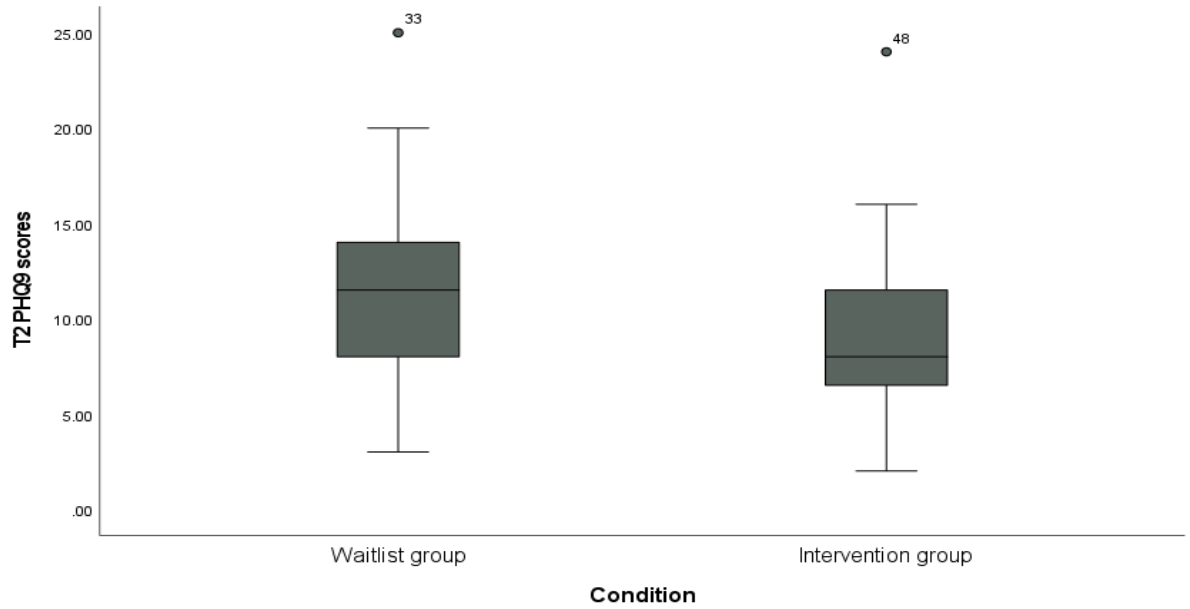
C1.1





C2

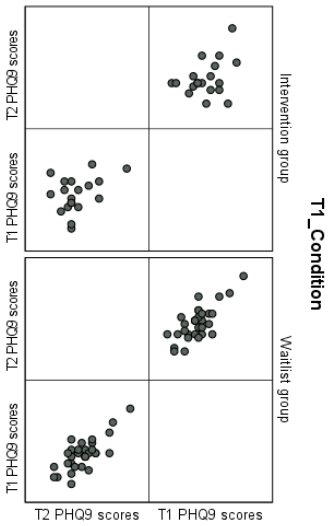
Test for outliers



Both groups has an outlier and therefore the assumption of no outliers has not been met.

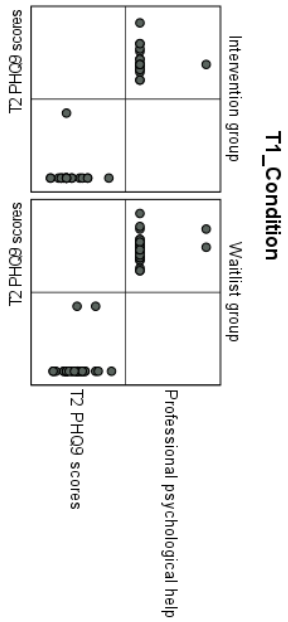
C3

Test for linearity



The assumption of linearity has been met for baseline depression symptom levels.

C3.1



The assumption of linearity for professional psychological help has not been met.

C4

Test for homogeneity of regression slopes for baseline symptom levels

	Test of Between-Subjects Effects		
	F	df	Sig.
Condition x baseline depression symptom levels	16.45	2	<.001

P<.05 and therefore the assumption of homogeneity of regression slopes for baseline symptom levels of depression has not been met.

C4.1

Test for homogeneity of regression slopes for professional psychological help

	Test of Between-Subjects Effects		
	F	df	Sig.
Condition x baseline depression symptom levels	1.07	2	.35

P>.05 and therefore the assumption of homogeneity of regression slopes for professional psychological help for depression has been met.

C5

Test for homogeneity of variances

Levene's test			
F	df 1	df 2	Sig.
1.61	1	49	.21

P>.05 and therefore the assumption of homogeneity of variances for depression has been met.

Appendix D

The assumption checks for the ANCOVA for PTSD

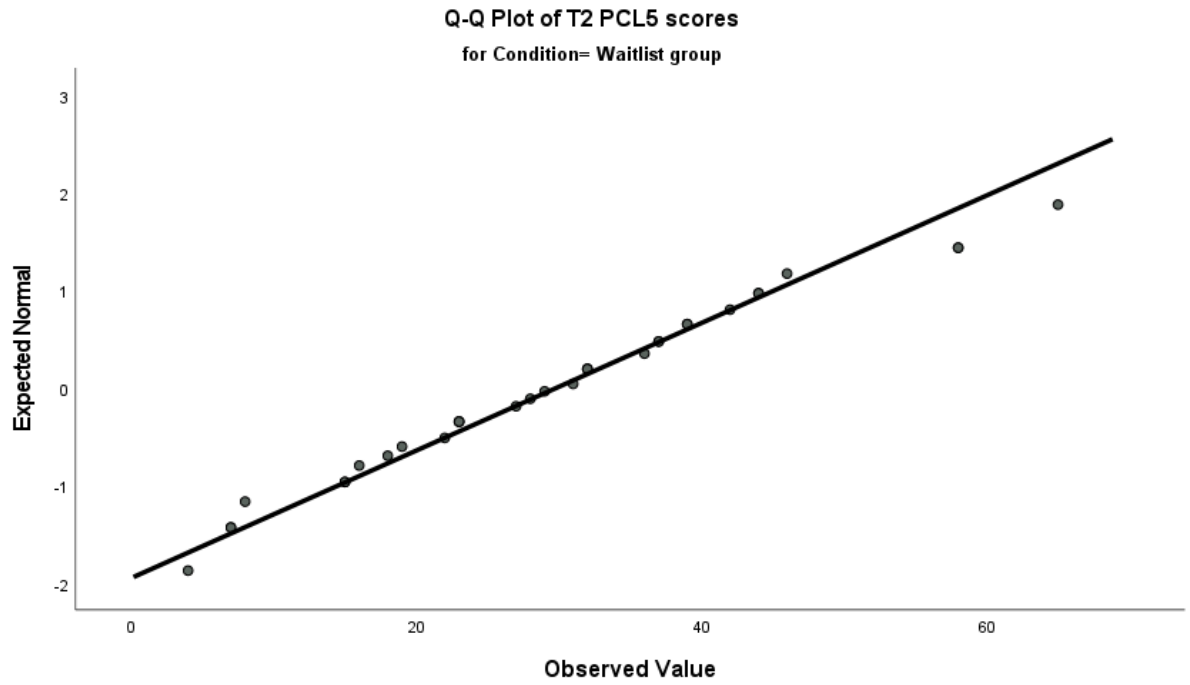
D1

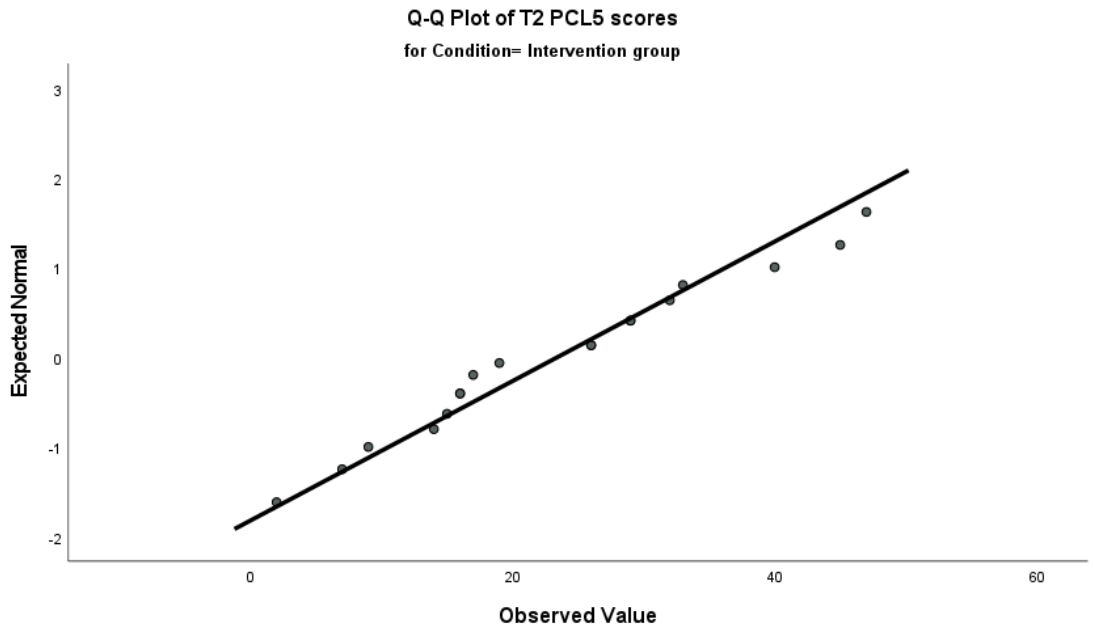
Test for normality

	Shapiro-Wilk		
	Statistic	df	Sig.
Intervention group	.08	32	.61
Waitlist-control group	.14	18	.70

P>.05 and therefore the assumption of normality for PTSD has been met.

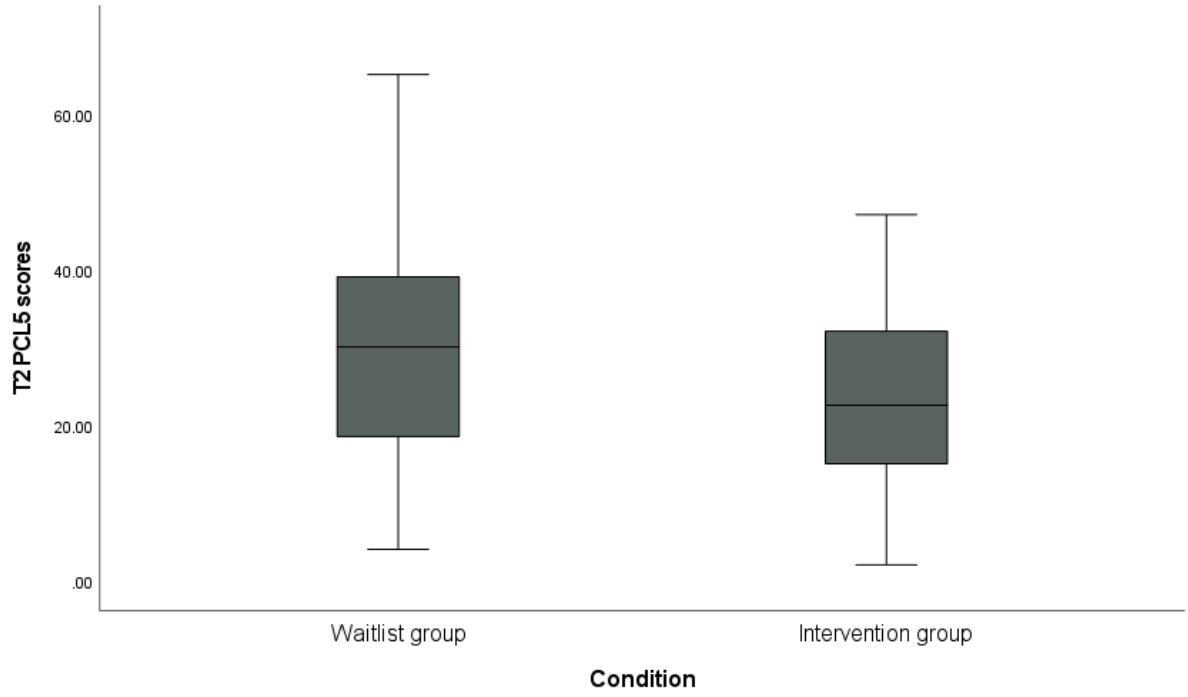
D1.1





D2

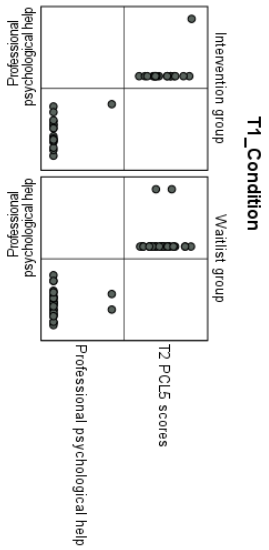
Test for outliers



There are not outliers and therefore the assumption of no outliers for PTSD has been met.

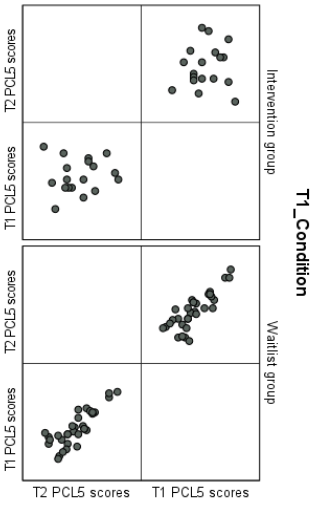
D3

Test for linearity



The assumption of linearity for baseline symptom levels of PTSD has not been met.

D3.1



The assumption of linearity for professional psychological help for PTSD has been met.

D4

Test for homogeneity of regression slopes for baseline symptom levels

	Test of Between-Subjects Effects		
	F	df	Sig.
Condition x baseline PTSD symptom levels	20.96	2	<.001

P<.05 and therefore the assumption of homogeneity of regression slopes for baseline symptom levels has not been met.

D4.1

Test for homogeneity of regression slopes for professional psychological help

	Test of Between-Subjects Effects		
	F	df	Sig.
Condition x professional psychological help	1.04	2	.36

P>.05 and therefore the assumption of homogeneity of regression slopes for professional psychological help for PTSD has been met.

D5

Test for homogeneity of variances

Levene's test			
F	df 1	df 2	Sig.
1.06	1	48	.31

P>.05 and therefore the assumption of homogeneity of variances for PTSD has been met.

Appendix E TGI-SR

TGI-SR ("Traumatic Grief Inventory-Self Report")

Hieronder staan verschillende rouwreacties. Geef aan in hoeverre u deze reacties hebt gehad **in de afgelopen maand**, naar aanleiding van het overlijden van uw dierbare. Hebt u meerdere verliezen meegemaakt? Ga dan uit van het verlies dat het meest in uw gedachten is en/of op dit moment het meest ingrijpend is.

		Nooit (1)	**Zelden (2)**	**Soms (3)**	**Vaak (4)**	**Altijd (5)**
1	Ik had plots opkomende gedachten en beelden die te maken hadden met zijn/haar dood.	☐	☐	☐	☐	☐
2	Ik had intense gevoelens van emotionele pijn, verdriet, of golven van rouw.	☐	☐	☐	☐	☐
3	Ik voelde een zeer sterk verlangen naar hem/haar.	☐	☐	☐	☐	☐
4	Ik voelde verwarring over mijn rol in het leven of een verminderd gevoel van eigenwaarde.	☐	☐	☐	☐	☐
5	Ik had moeite om zijn/haar dood te aanvaarden.	☐	☐	☐	☐	☐
6	Ik vermeed plaatsen, voorwerpen, of gedachten die mij eraan herinneren dat hij/zij dood is.	☐	☐	☐	☐	☐
7	Ik had moeite om mensen te vertrouwen.	☐	☐	☐	☐	☐
8	Ik voelde me bitter gestemd of boos over zijn/haar dood.	☐	☐	☐	☐	☐
9	Ik had moeite om door te gaan met mijn leven (bijvoorbeeld door nieuwe vrienden te maken, nieuwe interesses te ontwikkelen).	☐	☐	☐	☐	☐
10	Ik voelde mij verdoofd.	☐	☐	☐	☐	☐
11	Ik vond het leven leeg en zonder betekenis zonder hem/haar.	☐	☐	☐	☐	☐
12	Ik voelde me geschokt of verbijsterd over zijn/haar dood.	☐	☐	☐	☐	☐
13	Ik merkte dat mijn functioneren (in mijn werk, privéleven en/of sociale leven) ernstig is verslechterd ten gevolge van zijn/haar dood.	☐	☐	☐	☐	☐
14	Ik had plots opkomende gedachten en beelden die te maken hebben met de omstandigheden waaronder hij/zij is overleden.	☐	☐	☐	☐	☐
15	Het lukte mij niet goed om stil te staan bij positieve herinneringen aan hem/haar.	☐	☐	☐	☐	☐
16	Ik had negatieve gedachten over mijzelf die verband houden met zijn/haar dood (bijvoorbeeld gedachten over zelfverwijt).	☐	☐	☐	☐	☐
17	Ik had de wens om zelf te sterven, om bij hem/haar te kunnen zijn.	☐	☐	☐	☐	☐
18	Ik voelde mij alleen of voelde afstand tot andere mensen.	☐	☐	☐	☐	☐
		nooit	**zelden**	**soms**	**vaak**	**altijd**

Appendix F PHQ-9

PATIENT HEALTH QUESTIONNAIRE (PHQ-9)

ID #: _____ **DATE:** _____

Over the last 2 *weeks*, how often have you been bothered by any of the following problems? *(use "✓" to indicate your answer)*	Not at all	Several days	More than half the days	Nearly every day
1. Little interest or pleasure in doing things	0	1	2	3
2. Feeling down, depressed, or hopeless	0	1	2	3
3. Trouble falling or staying asleep, or sleeping too much	0	1	2	3
4. Feeling tired or having little energy	0	1	2	3
5. Poor appetite or overeating	0	1	2	3
6. Feeling bad about yourself—or that you are a failure or have let yourself or your family down	0	1	2	3
7. Trouble concentrating on things, such as reading the newspaper or watching television	0	1	2	3
8. Moving or speaking so slowly that other people could have noticed. Or the opposite — being so figety or restless that you have been moving around a lot more than usual	0	1	2	3
9. Thoughts that you would be better off dead, or of hurting yourself	0	1	2	3
		add columns	+	+

(Healthcare professional: For interpretation of TOTAL, please refer to accompanying scoring card). TOTAL:

PTSD Checklist 5 (PCL-5)

Instructions:

Below is a list of problems and complaints that people sometimes have in response to stressful life experiences. How much you have been bothered by that problem IN THE LAST MONTH.

		Not at all	A little bit	Moderately	Quite a bit	Extremely
1	Repeated, disturbing, and unwanted memories of the stressful experience?	0	1	2	3	4
2	Repeated, disturbing dreams of the stressful experience?	0	1	2	3	4
3	Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	0	1	2	3	4
4	Feeling very upset when something reminded you of the stressful experience?	0	1	2	3	4
5	Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, sweating)?	0	1	2	3	4
6	Avoiding memories, thoughts, or feelings related to the stressful experience?	0	1	2	3	4
7	Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	0	1	2	3	4
8	Trouble remembering important parts of the stressful experience?	0	1	2	3	4
9	Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	0	1	2	3	4
10	Blaming yourself or someone else for the stressful experience or what happened after it?	0	1	2	3	4
11	Having strong negative feelings such as fear, horror, anger, guilt, or shame?	0	1	2	3	4
12	Loss of interest in activities that you used to enjoy?	0	1	2	3	4
13	Feeling distant or cut off from other people?	0	1	2	3	4
14	Trouble experiencing positive feelings (for example, being unable to feel happiness or have loving feelings for people close to you)?	0	1	2	3	4
15	Irritable behaviour, angry outbursts, or acting aggressively?	0	1	2	3	4
16	Taking too many risks or doing things that could cause you harm?	0	1	2	3	4