



BASIC RESEARCH ARTICLE



The role of dissociation-related beliefs about memory in trauma-focused treatment

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ABSTRACT

Objective: Dysfunctional cognitions play a central role in the development of post-traumatic stress disorder (PTSD). However the role of specific dissociation-related beliefs about memory has not been previously investigated. This study aimed to investigate the role of dissociation-related beliefs about memory in trauma-focused treatment. It was hypothesized that patients with the dissociative subtype of PTSD would show higher levels of dissociation-related beliefs, dissociation-related beliefs about memory would decrease after trauma-focused treatment, and higher pre-treatment dissociation-related beliefs would be associated with fewer changes in PTSD symptoms.

Method: Post-traumatic symptoms, dissociative symptoms, and dissociation-related beliefs about memory were assessed in a sample of patients diagnosed with PTSD ($n = 111$) or the dissociative subtype of PTSD ($n = 61$). They underwent intensive trauma-focused treatment consisting of four or eight consecutive treatment days. On each treatment day, patients received 90 min of individual prolonged exposure (PE) in the morning and 90 min of individual eye movement desensitization and reprocessing (EMDR) therapy in the afternoon. The relationship between dissociation-related beliefs about memory and the effects of trauma-focused treatment was investigated.

Results: Dissociation-related beliefs about memory were significantly associated with PTSD and its dissociative symptoms. In addition, consistent with our hypothesis, patients with the dissociative subtype of PTSD scored significantly higher on dissociation-related beliefs about memory pre-treatment than those without the dissociative subtype. Additionally, the severity of these beliefs decreased significantly after trauma-related treatment. Contrary to our hypothesis, elevated dissociation-related beliefs did not negatively influence treatment outcome.

Conclusion: The results of the current study suggest that dissociation-related beliefs do not influence the outcome of trauma-focused treatment, and that trauma-focused treatment does not need to be altered specifically for patients experiencing more dissociation-related beliefs about memory because these beliefs decrease in association with treatment.

El papel de las creencias relacionadas con la disociación sobre los recuerdos en el tratamiento centrado en el trauma

Objetivo: Las cogniciones disfuncionales juegan un papel central en el desarrollo del trastorno de estrés posttraumático (TEPT). Sin embargo, el papel de creencias específicas sobre los recuerdos relacionados con la disociación no ha sido investigado previamente. Este estudio tuvo como objetivo investigar el papel de las creencias relacionadas con la disociación sobre el recuerdo en el tratamiento centrado en el trauma. Se planteó la hipótesis que los pacientes con el subtipo disociativo de TEPT mostrarían niveles más altos de creencias relacionadas con la disociación, las creencias relacionadas con la disociación sobre los recuerdos disminuirían después del tratamiento centrado en el trauma y las creencias relacionadas con la disociación más altas antes del tratamiento se asociarían con menos cambios en los síntomas de TEPT.

Método: Se evaluaron los síntomas posttraumáticos, síntomas disociativos y creencias relacionadas con la disociación sobre los recuerdos en una muestra de pacientes diagnosticados con TEPT ($n = 111$), o el subtipo disociativo de TEPT ($n = 61$). Se sometieron a

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Creencias relacionadas con la disociación sobre los recuerdos; TEPT; disociación; meta-memoria; tratamiento centrado en el trauma

关键词

关于记忆的解离相关信念; PTSD; 解离; 元记忆; 创伤聚焦治疗

HIGHLIGHTS

- This study investigated the role of dissociation-related beliefs about memory on trauma-focused treatment.
- Dissociation-related beliefs were related to post-traumatic and dissociative symptoms, and were especially prominent in patients with the dissociative subtype of post-traumatic stress disorder.
- Dissociation-related beliefs about memory do not impact the effectiveness of trauma-focused treatment. In fact, trauma-focused treatment effectively decreased these beliefs, suggesting that dissociation-related beliefs about memory should not be a determining factor in withholding patients from receiving trauma-focused therapy.

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una terapia intensiva centrada en el trauma que consistía en cuatro u ocho días de tratamiento consecutivos. En cada día de tratamiento, los pacientes recibieron 90 minutos de exposición prolongada (EP) individual, en las mañanas y 90 minutos de terapia de desensibilización y reprocesamiento por movimientos oculares (EMDR) en las tardes. Se investigó la relación entre las creencias relacionadas con la disociación sobre los recuerdos y los efectos del tratamiento centrado en el trauma.

Resultados: Las creencias relacionadas con la disociación sobre los recuerdos se asociaron significativamente con TEPT y sus síntomas disociativos. Además, consistente con nuestra hipótesis, los pacientes con el subtipo disociativo de TEPT obtuvieron puntuaciones significativamente más altas en las creencias relacionadas con la disociación sobre los recuerdos antes del tratamiento que aquellos sin el subtipo disociativo. Además, la severidad de esas creencias disminuyó significativamente después del tratamiento centrado en el trauma. Contrario a nuestra hipótesis, las creencias elevadas relacionadas con la disociación no influyeron negativamente los resultados del tratamiento.

Conclusión: Los resultados del presente estudio sugieren que las creencias relacionadas con la disociación no influyen los resultados del tratamiento centrado en el trauma, y que el tratamiento centrado en el trauma no necesita modificarse específicamente para los pacientes que experimentan más creencias relacionadas con la disociación sobre los recuerdos porque estas creencias disminuyen en asociación con el tratamiento.

关于记忆的解离相关信念在创伤聚焦治疗中的作用

目的: 认知功能失调在创伤后应激障碍 (PTSD) 的发展中发挥着核心作用。然而先前尚未研究过与记忆相关的特定解离相关信念的作用。本研究旨在调查关于记忆的解离相关信念在创伤聚焦治疗中的作用。据推测, 患有 PTSD 解离亚型的患者会表现出较高水平的解离相关信念, 创伤聚焦治疗后关于记忆的解离相关信念会减少, 治疗前较高的解离相关信念将与 PTSD 症状较少改变相关。

方法: 对诊断为 PTSD ($n = 111$) 或 PTSD 解离亚型 ($n = 61$) 的患者样本进行创伤后症状、解离症状和关于记忆的解离相关信念评估。他们接受了为期四到八天的连续创伤聚焦强化治疗。在每个治疗日, 患者早上接受 90 分钟的个人延长暴露 (PE) 治疗, 下午接受 90 分钟的个人眼动脱敏与再加工 (EMDR) 治疗。研究了关于记忆的解离相关信念与创伤聚焦治疗效果之间的关系。

结果: 关于记忆的解离相关信念与创伤后应激障碍 (PTSD) 及其解离症状显著相关。外, 与我们的假设一致, 患有 PTSD 解离亚型的患者在记忆预处理的解离相关信念方面得分显著高于非解离亚型的患者。此外, 在创伤相关治疗后, 这些信念的严重程度显著降低。与我们的假设相反, 解离相关信念的升高不会对治疗结果产生负面影响。

结论: 当前研究的结果表明, 解离相关信念不会影响创伤聚焦治疗的结果, 并且对于经历更多关于记忆的解离相关信念的患者, 不需要专门改变创伤聚焦治疗, 因为这些信念随着治疗而减少。

1. Introduction

Trauma-focused treatments have been found to be effective in reducing post-traumatic stress disorder (PTSD) symptoms (Mavranzezouli et al., 2020; Yunitri et al., 2023). However, not every patient diagnosed with PTSD benefits from trauma-focused treatment. A review of response rates in anxiety related disorders showed that for PTSD the average response rate is 60% (Loerinc et al., 2015). One factor hypothesized to influence the effect of trauma-focused treatment is dissociation. The question of whether dissociative symptoms impede to trauma processing in the treatment of post-traumatic stress disorder (PTSD) has been a topic of debate (e.g. Hagenaars et al., 2010; Hoeboer et al., 2020; Lanius et al., 2012). The current study investigated the influence of meta-memory beliefs regarding dissociation on the effect of trauma-focused treatment.

Numerous theories have emerged to explain the role of dissociative symptoms in trauma-focused therapy. One theory suggests that dissociative symptoms, such as numbness, depersonalization, and derealization, may be linked to brain activity that hampers emotional regulation, impeding the

activation of fear necessary for effective trauma-focused therapy (Ehlers & Clark, 2000; Lanius et al., 2010; Schnyder et al., 2015). However, a study conducted by Hagenaars et al. (2010) contradicted this hypothesis and found no evidence of dissociative symptoms hindering fear activation during exposure therapy. Consequently, pre-treatment dissociative symptoms did not predict the outcomes of trauma-focused treatment. Furthermore, Zoet et al. (2021) found no evidence that somatoform dissociation negatively affected the outcome of intensive trauma-focused treatment. Another view focuses on the influence of dissociative amnesia on trauma-focused treatment (Staniloiu & Markowitsch, 2018). Dissociative amnesia refers to the inability to recall important autobiographical information and is commonly observed in individuals with PTSD and dissociative disorders (American Psychiatric Association, 2013). However, various studies utilizing different stimuli and memory systems have failed to demonstrate any objective memory dysfunction in those who subjectively report dissociative amnesia (Allen & Movius, 2000; Huntjens et al., 2003; Marsh et al., 2018). An alternative explanation suggests that individuals reporting dissociative

amnesia may hold meta-memory beliefs regarding traumatic memory and dissociation, believing that retrieving and processing such memories could lead to negative consequences (Huntjens et al., 2022). These dissociation-related beliefs about memory are considered an underlying mechanism of dissociative amnesia (Huntjens et al., 2006, 2022; Kindt & Van den Hout, 2003). Examples of dissociation-related beliefs about memory are 'I believe I would lose control of my life if I allowed myself to remember painful things that happened to me', and 'I believe I can remember distressing events in parts, but not as a whole'.

Evidence suggests that dysfunctional beliefs or cognitions also play a central role in the development and maintenance of PTSD (e.g. Brown et al., 2019). Dysfunctional post-traumatic cognitions are at the core of several theoretical models of PTSD and include beliefs about self-blame (e.g. 'The event happened because of the way I acted'), perceived danger (e.g. 'Nowhere is safe'), and beliefs about being irreparably damaged by the traumatic event (e.g. 'My life has been destroyed by the trauma'; e.g. Brown et al., 2019; Ehlers & Clark, 2000). These cognitions are positively associated with PTSD symptom severity (Smith & Held, 2022; Startup et al., 2007). It has been demonstrated that trauma-focused treatment effectively reduces dysfunctional post-traumatic cognitions (e.g. Brown et al., 2019; Littleton & Grills, 2019; Van den Berg et al., 2015), even in trauma-focused interventions that do not specifically target dysfunctional cognitions, such as prolonged exposure (Kooistra et al., 2023) and EMDR therapy (Ironson et al., 2021; Valiente-Gómez et al., 2017). Furthermore, reductions in negative cognitions have been found to be associated with decreases in PTSD symptoms (Foa & Rauch, 2004), highlighting the crucial role of post-traumatic cognitions in the persistence of PTSD. Conversely, many studies have found that elevated dysfunctional post-traumatic cognitions are predictive of trauma-focused treatment outcome. For example, Held et al. (2021) found that veterans with severe dysfunctional post-traumatic cognitions at baseline experienced slower and smaller reductions in PTSD symptoms during intensive trauma-focused treatment. In addition, dysfunctional beliefs and cognitions about dissociation also play an important role in the maintenance of dissociative disorders, such as depersonalization disorder (Hunter et al., 2003).

Based on these theoretical models and research findings, it could be argued that dissociation-related dysfunctional beliefs about memory may also influence trauma-related symptom severity and the efficacy of trauma-focused treatment, especially in a subgroup of people with the dissociative subtype of PTSD (PTSD-D). This subtype includes patients who are diagnosed with PTSD and experience persistent

or recurrent symptoms of dissociation (American Psychiatric Association, 2013). PTSD-D has been found to be associated with an increased presence of various dissociative symptoms, including dissociative amnesia, depersonalization, and derealization (Armour et al., 2014; Ross et al., 2018). Findings on the effectiveness of trauma-focused treatment in patients with PTSD-D have been mixed. Wolf et al. (2016) investigated the influence of PTSD-D on treatment efficacy and found that the PTSD-D group showed poorer treatment response. However, this effect was small. In other studies (e.g. Van Minnen et al., 2015; Zoet et al., 2018), the presence of dissociative symptoms did not negatively influence the effectiveness of trauma-focused treatment.

The inconsistent results regarding the impact of dissociative symptoms on trauma-focused treatment may be attributed to patients underlying beliefs about their dissociative symptoms. Up until now, while numerous prior studies have considered maladaptive posttraumatic cognitions, none have examined the significance of cognitions specifically related to dissociation when exploring the outcomes of trauma-focused treatment. Therefore, the current study aimed to investigate the role of dissociation-related beliefs about memory in trauma-focused treatment. Differences between patients with PTSD-D and those with PTSD without the dissociative subtype with regard to dissociation-related beliefs about memory were investigated. We hypothesized that patients diagnosed with PTSD-D would report elevated dissociation-related dysfunctional beliefs. Thereafter, the decrease in dissociation-related beliefs about memory after trauma-focused treatment was investigated in both groups. Trauma-focused treatment, namely, challenges dysfunctional post-traumatic cognitions, resulting in a decrease after treatment. Accordingly, we hypothesized that dissociation-related beliefs about memory would significantly decrease after trauma-focused treatment. Because dysfunctional post-traumatic cognitions in general have been found to be predictive of trauma-focused treatment outcome (e.g. Kooistra et al., 2023), it was also hypothesized that higher pre-treatment dissociation-related beliefs about memory would be associated with fewer changes in PTSD symptoms during trauma-focused treatment outcome, especially in the subgroup of patients with PTSD-D.

2. Method

2.1. Participants

The sample of this study ($N=178$) consisted of patients from a mental health care centre specializing in the treatment of (complex) post-traumatic stress disorder (PTSD) in the Netherlands. The patients

received treatment between April and November 2021 and all provided informed consent. The inclusion criteria were: (1) PTSD diagnosis as measured with the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5; Boeschoten et al., 2018); (2) age 18 years or older; (3) sufficient knowledge of the Dutch language to receive treatment; and (4) no attempted suicide in the past three months. Of these 178 participants, four participants did not complete the treatment and were excluded from the analysis. Of the remaining 174 participants, 156 completed both pre- and post-treatment measurements on the various constructs. For the remaining 18 participants data were imputed, using the multiple imputation method with a fully conditional specification (Liu & De, 2015). For two participants, missing data could not be computed because too much questionnaire data were missing, resulting in a total sample size of 172 participants, of which 61 (35%) were diagnosed with PTSD-D. No significant differences were found between treatment completers and dropouts for any of the baseline variables. Of the 172 participants, 117 (68%) reported to have experienced trauma in the domain of accidents, 160 (93%) in the domain of physical abuse, 137 (80%) in the domain of sexual abuse, and 110 (64%) in the category 'other.'

2.2. Measures

PTSD Checklist for DSM-5 (PCL-5; Boeschoten et al., 2014; Weathers et al., 2013). The PCL-5 is a 20-item self-report measure that assesses the DSM-5 criteria of PTSD. Participants are asked to rate how much each item bothered them in the past week on a 5-point scale (0 = not at all to 4 = extremely). An example item of the PCL-5 is 'Repeated, disturbing dreams of the stressful experience,' which belongs to the Intrusion Symptom subscale. The PCL-5 was found to have good reliability and validity (Blevins et al., 2015; Boeschoten et al., 2014). The internal consistency of the PCL-5 in the current study, as indicated by Cronbach's alpha, was $\alpha = .87$ at pre-treatment and $\alpha = .96$ at post-treatment.

Dissociative Experiences Scale-II (DES-II; Bernstein & Putnam, 1986; Ensink & Van Otterloo, 1989). The DES-II is a self-report screening instrument for dissociative disorders consisting of 28 items that measure the frequency of dissociative experiences, including derealization, depersonalization, absorption, and amnesia. Participants are asked to rate the extent to which each item applies to them on an 11-point scale ranging from 0% to 100%. The mean score of all items is calculated with higher scores indicating more dissociation. An example item of the DES-II is 'Some people have the experience of finding themselves in a place and have no idea how they got there'. The DES-II has been found to have

good validity and reliability in both clinical and non-clinical samples (Collins & Jones, 2004; Ensink & Van Otterloo, 1989; Snow et al., 1996). The internal consistency of the DES-II in the current study, as indicated by Cronbach's alpha, was $\alpha = .93$ at pre-treatment and $\alpha = .95$ at post-treatment.

Dissociation-related beliefs about Memory Questionnaire (DBMQ; Huntjens et al., 2022). The DBMQ is a questionnaire containing 16 items designed to measure memory beliefs related to trait dissociation. The DBMQ consists of four subscales: Beliefs about amnesia, lack of self-reference, fragmentation, and fear of losing control. Participants are asked to rate how much each item applies to them on a 5-point scale (1 = not applicable to 5 = very much). An example item of the DBMQ is 'I believe that if I would allow myself to remember, my memories would overwhelm me', belonging to the subscale Fear of losing control. The DBMQ was found to have good reliability and construct validity (Huntjens et al., 2022). The internal consistency of the DBMQ in the current study, as indicated by Cronbach's alpha, was $\alpha = .88$ at pre-treatment and for the subscales the interitem correlations ranged from .40 to .59 at pre-treatment. Cronbach's alpha at post-treatment was $\alpha = .92$ and for the subscales the interitem correlations ranged from .39 to .57.

2.3. Procedure

The Medical Ethics Review Committee of the VU University Medical Centre (registered with the US Office for Human Research Protections as IRB00002991, FWA number FWA00017598) granted ethical exemption. Written informed consent was obtained for using the data for scientific research purposes after the patients were informed of the study. During the first intake, the PTSD diagnosis was established with the CAPS-5, last month version, assessed by trained clinical psychologists. Treatment case conceptualization was conducted during the second intake. In between intakes one and two, participants completed the PCL-5, the DES-II, and the DBMQ through a web-based Routine Outcome Monitoring tool. About one week (range 7–10 days) after the last treatment session, the post-treatment CAPS-5 (last week version) measurement was administered, and participants were again asked to complete the PCL-5, DES-II, and DBMQ online.

2.3.1. Treatment

The intensive trauma-focused treatment consisted of four (36%) or eight (64%) consecutive treatment days, the duration was dependent on the number of traumatic events that a patient reported. In the case of more than four traumatic experiences, the duration was eight days, whereas in the case of a four-day

indication, the treatment was usually delivered online. In case of eight days indication the first four days were delivered in the clinic (inpatient) and in the second week, they received another four treatment days which were usually delivered online. Of the participants included in this study, 71% received live treatment, and 29% received online treatment.¹ On each treatment day, patients received 90 min of individual prolonged exposure (PE) in the morning and 90 min of individual eye movement desensitization and reprocessing (EMDR) therapy in the afternoon.

PE was administered according to a modified version of the protocol described by Foa et al. (2007). During PE, participants were repeatedly exposed to traumatic memories (imaginal exposure), and trauma-related stimuli that evoked fear (exposure in vivo). EMDR therapy, based on the Dutch EMDR therapy protocol (De Jongh & Ten Broeke, 2013; Shapiro, 2018), involves revisiting the most distressing part of a traumatic experience. To enhance working memory, patients track the therapist's finger movements or engage in other cognitive-demanding tasks. All patients received EMDR 2.0 (Matthijssen et al., 2021), which intensifies the working memory load. No emotion regulation skills or relaxation techniques were provided before or during therapy as per De Jongh et al. (2019). The second phase of the standard EMDR protocol, involving a safe place exercise, was omitted to maintain focus on stabilization and trauma-focused treatment.

Psychologists with at least a master's degree in clinical psychology were trained in PE and EMDR therapy and delivered both PE and EMDR therapies. Furthermore, a therapist rotation model was used in which a different psychologist delivered each treatment session (see Van Minnen et al., 2018). In addition to the two trauma-focused treatment sessions, in both the inpatient and online conditions,

patients received a psychoeducation programme each treatment day and participated in several physical activities in a group setting. The physical activities consisted of indoor and outdoor activities of varying intensity, such as mountain biking and walking. Importantly, trauma-focused treatment commenced without a preparation or stabilization phase and contained no skill training (e.g. emotion regulation, relaxation, or grounding). For an extensive description of the treatment programme, see Van Woudenberg et al., 2018.

2.4. Statistical analyses

First, demographic variables of participants with PTSD and PTSD-D were compared using a chi-square difference test for independence. Second, the potential outliers were identified. For PCL-5 and DBMQ, no statistically significant outliers were detected by visual inspection of the boxplots and stem-and-leaf plots. For the DES-II, a significant outlier was identified. The analyses were repeated with and without this outlier. If the results differed with the inclusion or exclusion of outliers, this is reported in the results section. The fully conditional specification multiple imputation method (Liu & De, 2015) was used to impute missing values because the data showed a non-monotone pattern of missing values, which means that missing observations were distributed in a nonsystematic way. The percentage missing threshold was established at 10%, based on previous literature (Bennett, 2001; Eekhout, 2015). Assumptions were checked for all the analyses. In further analyses, pooled results from multiple imputations were used. Paired sample t-tests were used to evaluate the decreases in PCL-5, DES-II, and DBMQ scores between pre-treatment and post-treatment. T-tests were also used to examine whether the PTSD and PTSD-D groups differed in DBMQ scores. Repeated measures MANCOVA was used to investigate whether the decrease between pre- and post-treatment DBMQ total scores differed between the PTSD and PTSD-D groups, with the grouping variable as a covariate. The influence of the DBMQ scores on the outcome of trauma-focused treatment was assessed in both the total group and in the subsample of PTSD-D patients by assessing Pearson correlations between the DBMQ total score at pre-treatment and the difference in scores between pre- and post-treatment for the PCL-5 and DES.

3. Results

Table 1 shows the demographic details of all 172 participants and the subgroups of patients with and without PTSD-D. Regarding age, $F(44, 172) = 42.654$, $p = .53$, Cramer's $V = .50$, gender, $\chi^2(1, n = 172) = .04$, $p = .85$, Cramer's $V = .02$, marital status, $\chi^2(3, n =$

Table 1. Participant demographic data

	Total sample (<i>n</i> = 172)	PTSD (<i>n</i> = 111)	PTSD-D (<i>n</i> = 61)
Age <i>M</i> (<i>SD</i>)	40.67 (12.13)	40.31 (12.28)	41.33 (11.92)
Sex <i>n</i> (%)			
Male	75 (43.60)	49 (44.14)	26 (42.62)
Female	97 (56.40)	62 (55.86)	35 (57.38)
Marital status <i>n</i> (%)			
Married or cohabiting	75 (44.38)	45 (40.54)	30 (50.85)
Unmarried	73 (43.20)	49 (44.14)	24 (40.68)
Divorced	20 (11.83)	15 (13.51)	5 (8.48)
Widow/widower	1 (.59)	1 (.90)	0
Educational level <i>n</i> (%)			
No education	1 (.58)	1 (.90)	0
Primary education	6 (3.49)	4 (3.60)	2 (3.28)
Lower vocational education	7 (4.07)	6 (5.41)	1 (1.64)
Secondary education	32 (18.60)	20 (18.02)	12 (19.67)
Secondary vocational education	70 (40.70)	44 (39.64)	26 (42.62)
Higher professional education	49 (28.49)	31 (27.93)	18 (29.51)
Other	7 (4.07)	5 (4.50)	2 (3.28)

169) = 2.39, $p = .50$, Cramer's $V = .12$, and education, $\chi^2(6, n = 172) = 2.26$, $p = .90$, Cramer's $V = .12$, no group differences were found.

The mean scores and standard deviations of the PCL-5, DES-II, and DBMQ are presented in Table 2. Patients who were diagnosed with PTSD-D showed significantly higher total DBMQ scores at pre-treatment compared to patients diagnosed with PTSD, $t(170) = -2.37$, $p = .02$, $d = .38$.

For the subscales of the DBMQ, patients with PTSD-D scored significantly higher compared to those with PTSD on positive beliefs about amnesia, $t(170) = .155$, $p = .01$. No group differences were found in the fragmentation subscale, $t(170) = 1.07$, $p = .14$; lack of self-reference, $t(170) = .24$, $p = .20$; and fear of losing control, $t(170) = .205$, $p = .08$.

Results from the paired-samples t -test showed a significant reduction in the DBMQ scores between pre- and post-treatment in the total group, with a large effect size, $t(170) = 16.35$, $p < .001$, $d = 1.27$. As hypothesized, the reduction in DBMQ scores was also significant in the PTSD-D group, $t(60) = 10.66$, $p < .001$, $d = 1.61$. The results of the repeated-measures MANCOVA showed that the decrease in the DBMQ scores did not significantly differ between the PTSD and PTSD-D groups, $F(2, 169) = 1.03$, $p = .36$, Wilk's $\Lambda = .99$.

In the total group, there were significant reductions in PCL-5 scores between pre- and post-treatment ($t = 21.47$, $p < .01$, $d = 1.66$) and in DES-II scores between pre-treatment and post-treatment ($t = 10.27$, $p < .01$, $d = .80$), with large effect sizes. Contrary to our expectations, in the total group, the pre-treatment DBMQ score was not significantly related to a decrease in the PCL-5 score ($r = .11$, $p = .15$) or the DES-II score ($r = .14$, $p = .08$). Thus, the pre-treatment DBMQ score was not a predictor of treatment outcomes. For the subgroup of participants with PTSD-D, the

results were similar; the pre-treatment DBMQ score was not significantly related to a decrease in the PCL-5 score ($r = .03$, $p = .85$) or to the DES-II score ($r = .13$, $p = .34$).

4. Discussion

The study investigated the role of dissociation-related beliefs about memory in trauma-focused treatment in a sample of patients with PTSD and a specific subsample of patients with a dissociative subtype of PTSD (PTSD-D). The results support our hypothesis that PTSD-D patients had significantly more dysfunctional dissociation-related beliefs, and positive beliefs about amnesia compared to PTSD patients. Furthermore, in concordance with our hypothesis, the current study found that the severity of PTSD symptoms, dissociative symptoms, and dysfunctional dissociation-related beliefs about memory significantly decreased during trauma-related treatment in both the PTSD and PTSD-D groups. This decrease in dissociation-related beliefs about memory did not differ between the PTSD and PTSD-D groups. Contrary to our hypothesis, the strength of dysfunctional dissociation-related beliefs about memory at pre-treatment did not negatively influence treatment outcomes in the total sample, nor in a subsample of participants with the dissociative subtype of PTSD.

As expected, patients with PTSD-D had significantly stronger dysfunctional dissociation-related beliefs about memory, specifically in the domain of positive beliefs about amnesia, than those with PTSD without comorbid dissociative symptoms. This can potentially be explained by increased levels of avoidance related to dissociative symptoms. Following the dissociative avoidance hypothesis (Cloitre, 1992), people who experience dissociative symptoms employ an avoidant coping style towards dealing with negative affect, memories, and emotions (Huntjens et al., 2014). When patients show stronger dysfunctional dissociation-related beliefs about memory, they potentially have beliefs such as 'I believe it is better to forget the painful events that I experienced in life,' indicating an avoidant coping style. In line with this, the PTSD-D group, for whom previous research found that they also have had elevated symptoms of amnesia (Armour et al., 2014), specifically showed more dysfunctional beliefs about amnesia compared to the PTSD group. Clinically, this indicates that they, for instance, believe that it is better to forget certain things to survive, or that the memory gaps protect them. As was pointed out in the introduction, previous research found no evidence for objective amnesia in PTSD-patients, and our findings illustrate that PTSD-patients who tend to dissociate may report symptoms of amnesia that can better be explained by their beliefs about memory and remembering.

Table 2. Means and standard deviations of the questionnaires and the subscales at pre- and post-treatment.

	Total sample ($n = 172$) M (SD)	PTSD ($n = 111$) M (SD)	PTSD-D ($n = 61$) M (SD)
PCL-5			
Pre-treatment	48.85 (11.71)	46.60 (11.77)	52.92 (10.46)
Post-treatment	19.92 (16.21)	18.34 (16.34)	22.78 (16.52)
DES			
Pre-treatment	23.00 (15.97)	19.63 (14.57)	29.13 (16.76)
Post-treatment	12.49 (13.88)	10.12 (11.91)	16.80 (16.12)
DBMQ			
Pre-treatment	2.75 (.71)	2.66 (.72)	2.93 (.67)
Fragmentation	3.22 (1.06)	3.13 (1.09)	3.38 (1.01)
Beliefs about amnesia	3.31 (1.14)	3.14 (1.10)	3.63 (1.15)
Lack of self-reference	1.78 (.90)	1.72 (.90)	2.90 (.90)
Fear of losing control	3.60 (.93)	3.51 (.95)	3.77 (.87)
DBMQ			
Post-treatment	1.76 (.69)	1.72 (.70)	1.83 (.68)
Fragmentation	2.01 (.95)	1.97 (.96)	2.08 (.94)
Beliefs about amnesia	2.09 (1.10)	2.00 (1.08)	2.25 (1.11)
Lack of self-reference	1.41 (.66)	1.37 (.69)	1.48 (.62)
Fear of losing control	2.03 (.93)	2.00 (.97)	2.10 (.86)

The strength of dissociation-related beliefs about memory was not found to be predictive of reduced treatment results in terms of PTSD or dissociative symptoms, in both the total group and in the subsample of patients with the dissociative subtype. Although previous research found that post-traumatic cognitions negatively influenced the effectiveness of trauma-focused treatment (Held et al., 2021), a meta-analysis showed that elevated dissociative symptoms in patients with PTSD, including patients with PTSD-D, did not exert a negative effect on the effectiveness of trauma-focused therapy (Hoeboer et al., 2020). In addition, these results were also extended to other forms of dissociation, such as somatoform dissociation (Zoet et al., 2021).

Related to this, our study found that an intensive trauma-focused treatment programme significantly reduced dissociation-related beliefs about memory in both total and PTSD-D groups. It is important to note that the trauma-focused treatment remained unaltered for patients with PTSD-D, and matched the treatment provided to patients with PTSD. This is in line with previous studies showing that dissociative symptoms decreased significantly after standard trauma-focused therapy, such as prolonged exposure (Hagenaars et al., 2010; Van Minnen et al., 2015), and after intensive treatment that combines two evidence-based treatments (Zoet et al., 2018, 2021), without adaptation to dissociative symptoms (see also Hoeboer et al., 2020). Our findings are also consistent with those of a literature review indicating that trauma-focused treatments were associated with reductions in negative post-traumatic cognitions (Brown et al., 2019). A possible explanation for this decrease can be found in the mechanisms of change that are presumed to play a role in trauma-related treatment. Among other things these involve the falsification of negative beliefs associated with trauma. Trauma-focused therapy could help patients falsify dysfunctional meta-memory beliefs about dissociative amnesia, for example by having the patient experience, for example during exposure exercises, that if they remember the traumatic event, they will not go crazy or lose control.

A strength of our study is that we used a large sample of patients with PTSD, including a group with the dissociative subtype and a wide range of dissociative symptoms, increasing the generalizability of our results. The study had sufficient power to detect meaningful effect sizes. In addition, the participants received regular psychological healthcare, which increased the ecological validity of our findings. One limitation regarding the association between dissociative beliefs and treatment outcomes is that dissociative beliefs were not assessed during the treatment process. It remains unclear whether patients with high levels of dissociative symptoms or beliefs before treatment continue to exhibit these symptoms during the treatment

sessions. Within-session dissociation may affect treatment outcomes, as found in a previous study (Kleindienst et al., 2016). Therefore, we recommend that future studies should measure dissociative symptoms and beliefs during treatment sessions.

In conclusion, the current study examined dissociation-related beliefs about memory in relation to trauma-focused treatment. Participants with the dissociative subtype of PTSD exhibited higher levels of these dysfunctional beliefs. However, the results of this study indicate that these beliefs do not affect the effectiveness of trauma-focused treatment. In fact, trauma-focused therapies were found to have a positive influence on these beliefs, as they decreased after treatment. Therefore, these findings suggest that dissociation-related beliefs about memory should not be a determining factor in withholding patients from trauma-focused therapy. To this end, our study contributes to the existing literature by demonstrating that the strength of dissociation-related beliefs about memory does not hinder the outcomes of trauma-focused treatment, including a reduction in PTSD and dissociative symptoms. Clinically, this is an important finding, as it suggests that patients with these beliefs can benefit from regular trauma-focused treatment in the same way as patients without such beliefs, eliminating the need for adaptations in the application of existing trauma-focused therapies.

Note

1. See Van Woudenberg et al. (2018) for detailed information about the treatment program, and Bongaerts et al., 2021 for more details about the online delivery of intensive treatment.

Data availability statement

Data available on request due to privacy/ethical restrictions. The data that support the findings of this study are available on request from the corresponding author. The data are not publicly available due to their containing information that could compromise the privacy of research participants. Furthermore, participants were not asked to give consent of saving their data in a public data repository.

Disclosure statement

Agnes Van Minnen receives income for published book chapters on PTSD and for the training of postdoctoral professionals in prolonged exposure. Ad de Jongh receives income from published books on EMDR therapy and for the training of postdoctoral professionals in this method. The other authors do not have competing interests.

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