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Feasibility of EMDR for posttraumatic stress disorder in patients with personality disorders: a pilot study

Christina W. Slotema[a], David P. G. van den Berg [b], Annemieke Driessen[a,c,d], Bobbie Wilhelmus[a] and Ingmar H. A. Franken[c]

[a]Department of Personality Disorders, Parnassia Psychiatric Institute, The Hague, the Netherlands; [b]Department of Early Detection and Intervention Team, Parnassia Psychiatric Institute, The Hague, the Netherlands; [c]Department of Psychology, Education and Child Studies, Erasmus University Rotterdam, Rotterdam, the Netherlands; [d]Department of Psychotrauma, Parnassia Psychiatric Institute, The Hague, the Netherlands

ABSTRACT

Background: Trauma and posttraumatic stress disorder (PTSD) are prevalent in patients with personality disorders. Despite the established efficacy of eye movement desensitisation and reprocessing (EMDR) for PTSD, EMDR has barely been examined in patients with comorbid PTSD and personality disorders.

Objective: The aim of this study was to explore what changes occur in symptom severity of PTSD, dissociative symptoms, insomnia, non-suicidal self-injurious behaviour and auditory verbal hallucinations in patients with personality disorders during treatment with EMDR.

Method: This uncontrolled open feasibility study on EMDR for PTSD was an addition to treatment-as-usual for personality disorders. The outcome measures were the severity of PTSD symptoms, dissociation, insomnia, non-suicidal self-injury, and auditory verbal hallucinations.

Results: Forty-seven participants (22 with a borderline personality disorder, 25 with other personality disorders) were included. A significant reduction in the severity of symptoms of PTSD, dissociation and insomnia was observed after EMDR treatment (median of four sessions), and 40% of the participants scored below the threshold for PTSD diagnosis. No differences in efficacy were found between patients with borderline personality disorder and other personality disorders. EMDR treatment was completed by 68% of the participants.

Conclusions: The addition of EMDR techniques to treatment, as usual, may be beneficial in the treatment of PTSD in patients with personality disorders in order to reduce symptoms of PTSD, dissociation and insomnia. Although one-third of these patients did not complete the additional EMDR treatment, no severe complications (e.g. suicidal behaviour or hospitalisation) occurred. Controlled studies are needed to further investigate the validity of these findings.

Factibilidad de EMDR para el trastorno de estrés postraumático en pacientes con trastornos de personalidad: un estudio piloto

Antecedentes: El trauma y el trastorno de estrés postraumático (TEPT) son prevalentes en pacientes con trastornos de personalidad. A pesar de la eficacia establecida de desensibilización y reprocesamiento por movimientos oculares (EMDR) para el trastorno por estrés postraumático, el EMDR apenas se ha examinado en pacientes con trastorno por estrés postraumático comórbido con trastornos de la personalidad.

Objetivo: El objetivo de este estudio fue explorar qué cambios se producen en la gravedad de los síntomas del trastorno por estrés postraumático, los síntomas disociativos, el insomnio, las conductas autolesivas no suicidas y las alucinaciones verbales auditivas en pacientes con trastornos de la personalidad durante el tratamiento con EMDR.

Método: En este estudio de factibilidad abierto no controlado de EMDR para el trastorno de estrés postraumático, EMDR fue agregado al tratamiento habitual para los trastornos de personalidad. Los resultados evaluados fueron la gravedad de los síntomas de trastorno de estrés postraumático, la disociación, el insomnio, la autolesión no suicida y las alucinaciones verbales auditivas.

Resultados: Se incluyeron 47 participantes (22 con trastorno límite de la personalidad, 25 con otros trastornos de personalidad). Se observó una reducción significativa en la gravedad de los síntomas del trastorno de estrés postraumático, la disociación y el insomnio después del tratamiento con EMDR (mediana de cuatro sesiones), y el 40% de los participantes puntuaron por debajo del umbral para el diagnóstico de trastorno de estrés postraumático. No se encontraron diferencias en la eficacia entre los pacientes con trastorno límite de personalidad y otros trastornos de la personalidad. El tratamiento con EMDR fue completado por el 68% de los participantes.

Conclusiones: La adición de técnicas EMDR al tratamiento habitual puede ser beneficiosa en el tratamiento del trastorno de estrés postraumático en pacientes con trastornos de

HIGHLIGHTS
• After EMDR treatment a significant reduction in the severity of symptoms of PTSD, dissociation and insomnia was found in patients with personality disorders.
• After EMDR treatment 40% of the participants did not fulfil the criteria for (probable) PTSD anymore.
• Sixty-eight per cent of the patients completed EMDR treatment.
• The efficacy of EMDR did not differ between patients with borderline personality disorder and other personality disorders.

CONTACT Christina W. Slotema ✉ c.slotema@psyq.nl ▣ Parnassia Psychiatric Institute, The Hague, the Netherlands

personalidad para reducir los síntomas de trastorno de estrés postraumático, disociación e insomnio. Aunque un tercio de estos pacientes no completaron el tratamiento de EMDR adicional, no se presentaron complicaciones graves (por ejemplo, comportamiento suicida u hospitalización). Se requieren estudios controlados para investigar más a fondo la validez de estos hallazgos.

治疗人格障碍患者的创伤后应激障碍的可行性：一项试研究

背景：创伤和创伤后应激障碍（PTSD）在患有人格障碍的患者中普遍存在。尽管眼动脱敏和再加工（EMDR）对PTSD已确立有效，但在合并PTSD和人格障碍的患者中几乎考察过EMDR的效果。

目的：本研究旨在探讨EMDR治疗期间人格障碍患者PTSD症状、解离症状、失眠、非自杀自伤行为和听觉言语幻觉的变化。

方法：这项关于EMDR对PTSD疗效的非对照的开放可行性研究（uncontrolled open feasibility study）是对人格障碍常规治疗的补充。结果指标包括PTSD症状，解离，失眠，非自杀性自伤和听觉言语幻觉的严重程度。

结果：47名参与者中22名为边缘性人格障碍，25名为其他人格障碍。在EMDR治疗（中位数：四个疗程）后观察到PTSD，解离和失眠症状严重程度的显著降低，并且40%的参与者得分低于PTSD诊断的阈值。边缘型人格障碍和其他人格障碍患者的疗效无差异。 68%的参与者完成了EMDR治疗。

结论：在常规治疗中加入EMDR技术可能有助于治疗人格障碍患者的创伤后应激障碍，以减少创伤后应激障碍，解离和失眠的症状。尽管这些患者中有三分之一没有完成额外的EMDR治疗，但没有发生严重并发症（例如自杀行为或住院治疗）。需要进行对照研究以进一步验证这些发现的有效性。

1. Introduction

Posttraumatic stress disorder (PTSD) is characterised by unwanted intrusive memories, avoidance or efforts to avoid distressing memories associated with traumatic events, negative alterations in cognitions and mood, and hyperarousal (APA, 2013). Various psychotherapeutic interventions involving some form of exposure and 'trauma processing' have been developed for PTSD. The most frequently studied interventions include trauma-focused cognitive-behavioural therapy (CBT) and eye movement desensitisation and reprocessing (EMDR). Meta-analyses have found that these interventions were superior to waiting list conditions (Bisson et al., 2007), and were effective interventions for PTSD in adult survivors of childhood abuse (Ehring et al., 2014). Therefore, the Dutch clinical guidelines for anxiety disorders state that CBT and EMDR are the treatments of choice for patients suffering from PTSD (van Balkom et al., 2013).

Patients with personality disorders who seek treatment have emotional dysregulation, impairments in interpersonal functioning, high suicide risk and impulse control problems. In common with patients with psychotic and mood disorders, these patients display more trauma than people in the general population (Kessler, Sonnega, Bromet, Hughes, & Nelson, 1995). Rates of trauma exposure are particularly high in patients with BPD (Yen et al., 2002). Verbal, physical and sexual abuse during childhood have been reported in, respectively, 72%, 46% and 26% of BPD patients (Zanarini, Gunderson, Marino, Schwartz, & Frankenburg, 1989). Estimates of the prevalence of PTSD in patients with BPD range from 34% to 56% (Slotema, Blom, Niemantsverdriet, Deen, & Sommer, 2018; Zanarini

et al., 1998). The group of patients with comorbid BPD *and* PTSD have a lower quality of life, more comorbid disorders, a higher risk for suicide attempts, and a higher prevalence of childhood trauma than patients with only one of those diagnoses (Pagura et al., 2010). In an American sample of inpatients diagnosed with personality disorders other than BPD, Zanarini et al. (1998) found a prevalence rate for PTSD of 22%. One of the barriers to receiving established psychological therapies for PTSD in normal clinical practice is the uncertainty whether these interventions are safe, and do not increase symptoms in this population. Similar concerns have been made of patients with PTSD and serious mental illness/psychosis. Some recent studies show data suggesting that, compared to waiting list or usual care, neither CBT nor EMDR appear to cause more adverse events in this population (Sin, Spain, Furuta, Murrells, & Norman, 2017; van den Berg et al., 2016).

Now that the relatively high prevalence of trauma and PTSD in patients with personality disorders is beginning to be recognised, the number of studies on interventions for PTSD in this population is increasing. Interventions such as cognitive processing therapy (CPT), CBT, prolonged exposure (PE), trauma-focused dialectical behaviour therapy (DBT) and narrative exposure therapy show promising results. Thus, in a pilot study among 27 patients with military sexual trauma-related PTSD, CPT was found to be effective in reducing PTSD symptoms, irrespective of whether comorbid BPD was present (Holder, Holliday, Pai, & Suris, 2017). A significant reduction in symptoms of PTSD was also observed in an open-label study with CPT among 110 war veterans with PTSD and personality disorders (Walter, Bolte, Owens, & Chard, 2012).

Likewise, CBT was found to be effective for symptoms of PTSD in a secondary analysis of data, deriving from three randomised controlled trials, comprising 27 and 55 patients diagnosed with major depressive disorder, bipolar disorder, schizophrenia spectrum disorder, including BPD (Kredlow et al., 2017, study I and study II; Mueser et al., 2008, 2015), and 39 with borderline-personality characteristics (Clarke, Rizvi, & Resick, 2008). However, the decline of symptoms of PTSD did not differ between CBT and a brief treatment program, consisting of three sessions of breathing retraining and psychoeducation about trauma and PTSD (Kredlow et al., 2017, study II; Mueser et al., 2015).

In studies exploring the efficacy of PE Hembree et al. found a beneficial effect of PE with or without cognitive restructuring in 29 women diagnosed with personality disorders who had a history of rape, nonsexual assault in adulthood, or of sexual abuse in childhood (Hembree, Cahill, & Foa, 2004). PE was also found to be effective in combination with DBT in two small pilot studies. The first of these studies included war veterans with BPD (Meyers et al., 2017). The second study involved patients with BPD, PTSD, and (imminent) serious intentional self-injury, and led to significant reductions in the severity of PTSD (Harned, Korslund, Foa, & Linehan, 2012). In one randomised controlled trial, DBT plus prolonged exposure was superior to DBT alone in 26 patients with BPD who had a history of intentional self-injury, childhood abuse, and other traumatic experiences (Harned, Korslund, & Linehan, 2014). Finally, Bovin, Wolf, and Resick (2017) observed a significant reduction in the severity of PTSD symptoms and features of personality disorders (5 and 10 years after participation) in a randomised controlled trial of CPT combined with prolonged exposure. Trauma-focused DBT was investigated in three studies. In an open-label study, Steil, Dyer, Priebe, Kleindienst, and Bohus (2011) included 29 patients who suffered from PTSD related to childhood sexual abuse who had also been diagnosed with major depressive disorder, anorexia/bulimia nervosa, substance abuse/dependence or BPD, and found positive effects on the severity of PTSD. Their findings were supported by an RCT involving DBT and cognitive and exposure-based interventions versus treatment as usual, in 74 female inpatients with childhood sexual abuse-related PTSD who met at least four criteria for BPD, or had at least one current diagnosis of eating disorder, major depressive disorder or substance abuse disorder (Bohus et al., 2013). Thirty-three participants fulfilled the criteria for BPD, but neither the diagnosis of BPD, nor the severity or number of symptoms of BPD were significantly related to treatment outcome. Similar findings were also reported in an open-label study with 21 female outpatients who fulfilled at least four criteria for BPD, and had a history of childhood sexual abuse (Steil et al., 2018). Narrative exposure therapy resulted in a reduction

of symptoms of PTSD, depression and dissociation in two pilot trials with patients diagnosed with BPD and PTSD (Pabst et al., 2012; Steuwe et al., 2016). Summing up, all studies reported positive effects of psychotherapy for PTSD, save for one non-randomised, controlled study involving interpersonal process group therapy among 11 females diagnosed with BPD who had a history of childhood sexual abuse (Cloitre & Koenen, 2001). Although the numbers of participants in the studies described were small to moderate, the results of these studies are promising and the treatment of PTSD in all these patients with personality disorders appeared to be safe.

EMDR is a novel form of psychotherapy which aims to alleviate distress associated with traumatic memories is EMDR, reformulate negative beliefs, and reduce physiological arousal (Shapiro, 2001; Shapiro & Solomon, 1995). During EMDR therapy the patient attends to emotionally disturbing material in brief sequential doses while simultaneously focusing on an external stimulus. In this psychotherapy, memories of traumatic events are processed with the aim of changing dysfunctional beliefs about the self and others due to the traumas. There are several hypotheses concerning the working mechanisms of EMDR. The 'working memory hypothesis' positing the notion that the dual task offered in EMDR during memory recall reduces the emotional intensity and vividness of traumatic memories has currently the most scientific support (Maxfield, Melnyk, & Hayman, 2008; van den Hout & Engelhard, 2012). Very few studies have investigated EMDR in patients with personality disorders. In a case study, a positive effect of EMDR was observed in a woman with BPD (Brown & Shapiro, 2006). As far as we are aware and despite the established efficacy of EMDR for PTSD, this technique has not been investigated as an intervention for PTSD in patients with BPD.

In summary, EMDR is an effective treatment for patients suffering from PTSD. Although patients with personality disorders often present with comorbid PTSD, few studies have evaluated the efficacy of psychological interventions for PTSD in this group. As a consequence, these patients are currently not receiving effective treatment for PTSD. This feasibility study aimed to investigate the treatment of PTSD in personality disorders by addressing the following questions:

1.1. Primary research question

During treatment with EMDR, what changes occur in symptom severity of PTSD, dissociative symptoms, insomnia, non-suicidal self-injurious behaviour and auditory verbal hallucinations in patients with personality disorders?

1.2. Secondary research questions

Do the changes that occur during treatment with EMDR differ between patients with BPD and those with other personality disorders? What is the drop-out rate during EMDR treatment in patients with personality disorders?

2. Methods

2.1. Participants

Between 2014 and 2018 participants were recruited from an outpatient clinic specialised in the treatment of personality disorders, i.e. Parnassia Psychiatric Institute, The Hague (the Netherlands). The study was approved by the local Medical Ethical Committee. All participants provided written informed consent, and the study was conducted in accordance with the Declaration of Helsinki (October 2013).

Criteria for inclusion were 1) minimum age 18 years; 2) primary diagnosis of a personality disorder according to the DSM-IV-TR, 3) a diagnosis of PTSD according to the DSM-IV-TR, and 4) a summed score on the Posttraumatic Diagnostic Scale (PDS) ≥ 18, which is the cut-off point for a diagnosis of probable PTSD (Foa, Cashman, Jaycox, & Perry, 1997). A clinical interview performed by a psychologist or psychiatrist, experienced in the field of personality disorders and PTSD, was used as a diagnostic assessment for these disorders. Patients were excluded if their estimated IQ was ≤70, or if they lacked adequate competence in the Dutch language.

In this study, all patients continued to receive treatment by a certified therapist for their personality disorders, whereas a different therapist applied the EMDR treatment.

The study included 47 participants (87% females) with a mean age of 37 years. For all patients, treatment-as-usual consisted of psychodynamic psychotherapy (23%), CBT (2%), schema-focused therapy (18%), DBT (7%), supporting sessions (39%), family therapy (7%) or other therapy (5%), either individually (93%) or in a group (7%). The choice of treatment depended on the participant's capacity to participate in a group setting, the introspective ability of the patient, and the training of the therapist. In addition, 52% of the participants received psychiatric medication.

2.2. Outcome parameters

The following outcome measures were investigated:

(1) The severity of PTSD was assessed with the PDS. This self-report instrument yields both a probable diagnosis of PTSD and a measure of PTSD symptom severity (Foa et al., 1997);

a score of at least 18 on the summed items of the PDS indicates that a patient has probable PTSD.

(2) The severity of dissociative symptoms was examined with the Dissociative Experience Scale (DES); this self-assessment questionnaire was developed to measure dissociation in normal and clinical populations (Bernstein & Putnam, 1986).

(3) The severity of insomnia was investigated with the Insomnia Severity Index (ISI), which is a self-report instrument (Bastien, Vallières, & Morin, 2001).

(4) The severity of self-injurious behaviour, i.e. non-suicidal self-injury, was analysed with the Deliberate Self-Harm Inventory (DSHI), which is also a self-report measure (Gratz, 2001).

(5) The severity of auditory verbal hallucinations (AVH) was assessed with the Auditory verbal Hallucinations Rating Scale (AHRS) (Haddock, McCarron, Tarrier, & Faragher, 1999). This is an 11-item subscale of the Psychotic Symptom Rating Scale that explores phenomenological characteristics and ensuing distress of AVH.

Data were collected at baseline and at the end of treatment.

2.3. Eye movement desensitisation and reprocessing

EMDR was applied as an addition to treatment-as-usual for personality disorders (see Results for the included treatments). We adopted the same procedures as used in a pilot study on EMDR in participants with a psychotic disorder (van den Berg & van der Gaag, 2012), and used the Dutch version of the standard EMDR protocol (de Jongh & ten Broeke, 2003). EMDR was primarily focused on traumas associated with the current PTSD symptoms. This means that the starting point for the case conceptualisation was an inventory of the PTSD-re-experienced symptoms that caused most of the burden in the previous weeks. The relevant memories were identified, and the participant was asked to what extent a confrontation in the 'here and now' with each memory caused distress. Hereafter, the standard protocol was applied first to the most distressing target memory. Each EMDR session lasted 60–90 min. Psychotherapeutic stabilisation sessions could be integrated into the therapy if necessary. In accordance with standard procedures at the treatment facility, EMDR treatment was ended when both the participant and therapist agreed that clinical improvement for PTSD had been achieved. EMDR was applied by psychologists and psychiatrists who had followed at least the basic or level 1 EMDR training at a certified institute. Once every two weeks peer supervision meetings were organised. In addition,

a supervisor (experienced in the field of EMDR) was available on demand throughout the study.

2.4. Statistical analyses

Data analysis was performed with the SPSS version 23. Demographic differences between the group with BPD and the group with other personality disorders were analysed with Chi-square tests and independent samples t-tests. The Mann–Whitney U-test was used for the number of comorbid psychiatric disorders, total number of sessions including EMDR and the total number of EMDR sessions, as these parameters were not normally distributed.

Differences between the severity of PTSD symptoms and insomnia were compared between baseline and end of treatment by means of paired-samples t-tests. As findings for the summed score of the DES, the DSHI and the AHRS were not normally distributed, Wilcoxon signed-rank tests were used to analyse these outcomes.

Differences in changes during EMDR treatment between the group with BPD and the group with other personality disorders were explored with independent samples t-tests and Mann–Whitney U-tests.

As a sensitivity analysis, all analyses of the outcome measures were repeated with last-observation-carried-forward for missing end-of-treatment data. The Benjamini-Hochberg procedure was used to correct for multiple testing (Benjamini & Hochberg, 1995).

Cohen's d and r effect sizes were computed for, respectively, normally and non-normally distributed data. Cohen's d was computed by dividing the mean difference by the standard deviation of the pretest data; r effect size was calculated by dividing the Z-value by the square root of the number of pairs, times two.

3. Results

Demographic data are presented in Table 1; 22 patients were diagnosed with BPD and 25 had other personality disorders, i.e. personality disorder not otherwise specified in 47%, cluster A personality disorders in 2%, cluster B personality disorders other than BPD in 4%, and cluster C personality disorders in 4%. Sixty-eight per cent of the participants had at least one other comorbid psychiatric disorder than PTSD. Childhood trauma was reported by 82%; the most common trauma was sexual abuse. Eleven patients (23%) experienced AVH at least once

Table 1. Demographic data of the study population (n = 47).

	Total N = 47		BPD N = 22		No BPD N = 25				
	n	%	n	%	n	%	Test statistic	df	p
Sex, female	41	87	20	91	21	84	FET		0.67
Age in years, mean (sd)	37.4	10.1	36.2	9.3	38.4	10.8	$t = 0.749$	45	0.46
Ethnicity (n = 45)							PCS = 3.63	5	0.60
Caucasian	24	53	10	48	14	58			
Arabic	11	24	7	33	4	17			
Other (African, Asian and other)	10	22	4	19	6	25			
Education (n = 45)							PCS = 1.27	2	0.53
Lower	16	36	9	43	7	29			
Medium	15	33	7	33	8	33			
High	14	31	5	24	9	38			
Relationship ≥ 1 year (n = 43)	21	49	9	45	12	52	FET		0.67
Comorbidity (n = 44)									
Depressive disorder	22	50	11	52	11	48	FET		1.00
Anxiety disorder	14	32	8	38	6	26	FET		0.52
ADHD	7	16	5	24	2	9	FET		0.23
Eating disorders	4	9	1	5	3	13	FET		0.61
Other comorbid disorders	13	30	5	24	8	35	FET		0.52
Total comorbid disorders, median, range	2	0–4	2	1–4	2	0–3	MWUT = 238.00, Z = 0.086		0.93
Type of trauma									
Childhood trauma (n = 44)	36	82	19	90	17	74	PCS = 5.97	2	0.51
Complex trauma (n = 45)	38	84	20	95	18	75	FET		0.10
Accident (n = 45)	5	11	1	5	4	17	FET		0.35
War related (n = 45)	3	7	2	10	1	4	FET		0.59
Bullying (n = 45)	4	9	1	5	3	13	FET		0.61
Physical abuse (n = 45)	27	60	16	76	11	46	FET		0.066
Emotional abuse (n = 44)	18	41	12	57	6	26	FET		0.065
Sexual abuse (n = 45)	28	62	15	71	13	54	FET		0.36
Medication (n = 44)									
Antidepressants	21	48	12	60	9	38	FET		0.23
Mood stabiliser	5	11	3	15	2	8	FET		0.65
Antipsychotics	6	14	4	20	2	8	FET		0.39
Benzodiazepines	8	18	4	20	4	17	FET		0.10
Duration of treatment until EMDR, months, median, range	24	4–108	24	9–88	27	4–108	MWUT = 225.50, Z = 0.40		0.69
Sessions including stabilisation, median, range	4	1–17	4	1–12	4	1–17	MWUT = 256.50, Z = 0.10		0.92
EMDR sessions, median, range	4	1–15	4	1–10	4	1–15	MWUT = 266.50, Z = 0.33		0.74

BPD = borderline personality disorder; FET = Fisher's Exact test; MWUT = Mann–Whitney U-test; PCS = Pearson's Chi-square

a week. At baseline, there were no differences in demographic findings and scores for the outcome measures between the two groups (i.e. BPD versus no BPD).

Changes during treatment with EMDR are presented in Table 2. There was a significant reduction in symptom severity of PTSD, dissociation and insomnia, whereas the results for AVH and non-suicidal self-injurious behaviour were not significant. Of all participants, 40% had an end-of-treatment severity score for PTSD below threshold, indicating remission. No differences in outcome were found between the group with BPD and the group with other personality disorders. With the Benjamini-Hochberg procedure for multiple testing, we found that the results for AVH (last observation carried forward) were no longer significant. Sensitivity analyses with last-observation-carried-forward did not change these results. Effect sizes (Cohen's d) were, respectively, 2.3 (large) and 0.76 (large) for the change of severity of PTSD and insomnia during EMDR treatment. R effect sizes for respective dissociation, AVH, and non-suicidal self-injurious behaviour were 0.45 (moderate to large), 0.20 (small to medium), and 0.21 (small to medium).

The total number of dropouts was 15 (32%), i.e. 6 (27%) in the BPD group and 9 (36%) in the group with other personality disorders. Reasons for dropping out were related to the EMDR treatment in seven patients (15%), i.e. EMDR treatment was experienced as stressful with an increase of instability (n = 4), treatment did not help (n = 2), and physical problems (n = 1). Of all patients, 11% (n = 5) dropped out from treatment for both personality disorders and EMDR, and for three patients the reason was unknown. The only difference between completers and dropouts was that the latter group had higher baseline scores for insomnia (t = 2.90, df = 43, p = 0.006); no differences in any of the other outcomes were found between completers and dropouts. The median number of sessions of completers was 4, i.e. 2–5 sessions in 68%, 6–10 in 29%, and 15 sessions in 3% (i.e. 1 patient).

4. Discussion

The aim of this open pilot study was to explore the feasibility of EMDR in participants with both PTSD and a personality disorder. EMDR was used as an addition to treatment-as-usual for the personality disorder. Of the 47 included patients, 82% reported childhood trauma. During treatment with EMDR there was a significant reduction in the severity of PTSD, dissociation and insomnia, whereas changes in the severity of auditory verbal hallucinations (AVH) and non-suicidal self-injury were not significant. At the end of treatment, 40% of the

Table 2. Results of EMDR in patients with personality disorders and posttraumatic stress disorder.

	Total N = 47				Pre EMDR					Post EMDR			
	Pre-EMDR Mean (sd)	Post-EMDR Mean (sd)	Test statistic	df	p	BPD N = 22 Mean (sd)	Non-BPD N = 25 Mean (sd)	Test statistic	df	p	BPD N = 16 Mean (sd)	Non-BPD N = 16 Mean (sd)	Test statistic	df	p
PDS	35.8 (7.8)	17.5 (11.5)	t* = 7.94 LOCF t* = 6.212	31 46	<0.001 <0.001	36.1 (7.9)	35.6 (7.8)	t** = 0.21	45	0.83	14.3 (8.3)	20.7 (13.5)	t** = 1.61 LOCF t** = 1.43	30 45	0.12 0.16
PDS in remission, n (%)	19/47 (40)										12/22 (55)	7/25 (28)	FET		0.81
DES, median	22.14	7.9	WSRT = 60,00 Z = −3.55 LOCF WSRT = 79.50, Z = −3.59		<0.001 <0.001	26.4	20.4	MWUT = 300.50, Z = 0.54		0.59	5.4	15.3	MWUT = 74.50, Z = −1.80 LOCF MWUT = 232.50, Z = −0.91		0.072 0.37
ISI	17.6 (6.7)	10.7 (7.4)	t* = 2.81 LOCF t* = 2.73	30 44	0.009 0.009	18.3 (6.5)	16.8 (7)	t** = 0.74	43	0.46	11 (8.5)	10.3 (6.6)	t** = 0.25 LOCF t** = 0.35	29 43	0.80 0.73
DSHI, median	14	14	WSRT = 33.00, Z = −1.54 LOCF WSRT = 33.00, Z = −1.54		0.12 0.12	14	14	MWUT = 252.00, Z = −0.028		0.98	14	14	MWUT = 114.50, Z = 0.12 MWUT M = 264.50, Z = 0.31		0.91 0.76
AHRS, median	0	0	WSRT = 7.00, Z = −1.55 LOCF WSRT = 12.00, Z = −2.12		0.12 0.034	0	0	MWUT = 278.00, Z = 0.077		0.94	0	0	MWUT = 79.00, Z = −0.41 LOCF MWUT = 258.00, Z = −0.46		0.80 0.65

*t test for dependent samples, **t test for independent samples, DES = Dissociative Experience Scale, DSHI = Deliberate Self-Harm Inventory, FET = Fisher's Exact Test, ISI = Insomnia Severity Index, LOCF = Last observation carried forward, MWUT = Mann–Whitney U Test, PDS = Posttraumatic Diagnostic Scale, PSYRATS = Psychotic Symptom Rating Scales, WSRT = Wilcoxon Signed Rank Test. For the Mann–Whitney U Test and Wilcoxon Signed Rank Test asymptotic significances are displayed.

participants scored below the threshold suggestive of a probable diagnosis of PTSD. Demographic data, type of trauma, and change during EMDR treatment did not differ between patients with BPD and those with other personality disorders. Of all patients, 68% completed the EMDR treatment, with a median of four sessions.

The number of trauma-focused psychological interventions that may potentially be helpful for treating PTSD in patients with BPD is increasing. Although conclusive data are lacking, findings from several studies suggest that cognitive behavioural therapy, narrative exposure therapy, prolonged exposure (in combination with dialectical behaviour therapy), trauma-focused dialectical behaviour therapy, and cognitive processing therapy are promising interventions for PTSD in these patients (Bohus et al., 2013; Clarke et al., 2008; Harned et al., 2012, 2014; Hembree et al., 2004; Holder et al., 2017; Kredlow et al., 2017; Meyers et al., 2017; Pabst et al., 2012; Steuwe et al., 2016; Walter et al., 2012). There is also some evidence to suggest that trauma-focused psychotherapy can be beneficial for other personality disorders as well (Bovin et al., 2017; Walter et al., 2012). Despite the significant decrease of PTSD symptoms during EMDR treatment, mean scores for severity of PTSD remained high and only 40% of our participants had scores below the threshold for PTSD. This might be due to the large percentage of the patients with childhood trauma since, for most childhood-onset trauma patients, EMDR does not result in the complete remission of symptoms (van der Kolk et al., 2007). Alternatively, it might be due to receiving only (median) four sessions which, for many participants with a severe history of trauma, was probably an insufficient dose to attain remission. Our findings concerning the reduction of dissociative symptoms are consistent with some reports on trauma-focused psychotherapy in BPD (Harned et al., 2012, 2014; Pabst et al., 2012; Steuwe et al., 2016), although others have not observed this change (Bohus et al., 2013).

In the present study, the severity of non-suicidal self-injury (a symptom of BPD) remained unchanged. This is in line with results for trauma-focused dialectical behavioural therapy in this group, and for EMDR in BPD and psychotic disorders (Bohus et al., 2013; van den Berg et al., 2016). However, this is in contrast with the finding that trauma-focused therapy induced a reduction in symptoms in PTSD as well as personality disorders (Bovin et al., 2017). Previous studies, including those with a severe mental illness, show that approximately 30% of the patients, drop out from studies on trauma-focused psychotherapy (Harned et al., 2012; Kredlow et al., 2017; Mueser et al., 2008; Steel et al.,

2017; van den Berg et al., 2015). We found a similar dropout rate of 32%.

4.1. Implications for clinical practice and future research

Our findings have several implications for clinical practice. Firstly, patients with severe personality disorders (including comorbid psychiatric disorders other than PTSD) who have received specialised treatment for their personality disorder, may benefit from EMDR (with a median of four sessions) for PTSD without any additional interventions aimed at stabilisation. We found that during treatment with EMDR, the severity of non-suicidal self-injury did not change for individuals who remained in treatment. Since non-suicidal self-injury is an important symptom of BPD, this suggests that EMDR may not have an adverse effect on BPD symptoms. Secondly, severity and type of trauma did not differ between patients with BPD and patients with other personality disorders. Significant changes were found during EMDR treatment in patients with BPD and other personality disorders, but without significant differences between the groups. This might indicate that it is important to also routinely assess trauma and PTSD in patients with personality disorders other than BPD, and offer them appropriate treatment. Thirdly, although the number of dropouts in our study was relatively high, neither suicidal behaviour nor hospitalisation was reasons for premature cessation of participation. Our findings, therefore, suggest that there is no good reason to withhold psychological therapy for PTSD from these patients if they are receiving appropriate treatment for a personality disorder (Meyer, Farrell, Kemp, Blakey, & Deacon, 2014).

Future studies should focus on the efficacy of EMDR using an RCT design. Such trials could also explore the effects of a larger dose of EMDR therapy in this group. It would be useful to investigate the effects of EMDR in the initial phase of treatment of personality disorders; e.g. patients may derive more benefit from treatment of their personality disorder if PTSD is treated first (van Minnen, Harned, Zoellner, & Mills, 2012). Treatment of PTSD and of personality disorders can reduce the symptoms of personality disorders and PTSD; however, since the duration of treatment for PTSD is shorter than that for personality disorders, Bovin and colleagues (Bovin et al., 2017) advise to start with the PTSD treatment. A broader scope of the effects of EMDR should be explored; e.g. patients with personality disorders *and* PTSD might experience a reduction in the severity of depression, anxiety, paranoia, and improvement in general functioning due to treatment with EMDR.

4.2. Study limitations

The following limitations should be noted. Firstly, in the absence of a control condition, our findings could be the result of other factors, such as the natural remission of PTSD symptoms. However, in most patients, EMDR was not added in the initial phase of treatment for personality disorders. Secondly, only self-report measures were used, whereas a structured interview for PTSD may have provided more detailed and valid information on PTSD. Likewise, no standardised instruments were used to diagnose personality disorders. Thirdly, not every patient received the same number or duration of treatment sessions. In addition, as EMDR was discontinued when both patient and therapist agreed that a sufficient decrease of symptom severity had been achieved, EMDR might be stopped when only few symptoms were present. With a fluctuating course of symptoms, the results might, therefore, be more positive than they would have been with a fixed number of EMDR sessions. Fourth, since EMDR treatment was ended when both patient and therapist agreed that a sufficient decrease of symptoms was achieved, a relatively high number of EMDR sessions might have been expected. However, the median number of sessions for all patients (also completers) was 4, and only one patient received ≥10 sessions (i.e. 15). Fifth, the duration of effect of EMDR is unknown, as no follow-up data were collected. Sixth, although complex PTSD (Maercker et al., 2013) is considered to be distinct from BPD (Cloitre, Garvert, Weiss, Carlson, & Bryant, 2014), its core features can cause dysregulation, identity alterations and relational impairment and, therefore, the two diagnoses have some overlap (Knefel, Tran, & Lueger-Schuster, 2016). However, since the presence of complex PTSD was not examined in our population, it is unknown whether the rate for the remission of PTSD is lower in patients with complex PTSD. Seventh, the number of patients in the BPD group and the group with other personality disorders was low. Finally, the number of dropouts was relatively high, thereby limiting the generalisability of our results. However, the sample size was large, and sensitivity analyses with (very conservative) last observation- carried-forward did not alter the findings. Notably, the p-value for the analysis for AVH with last observation carried forward was lower, because of the sample size – and therefore the number of degrees of freedom – were larger. Moreover, as the differences between baseline and end of treatment decreased, the standard error was smaller. In addition, there were no baseline differences between the completers and dropouts, except for higher scores for severity of insomnia in the dropouts.

5. Conclusions

This feasibility pilot study shows that EMDR may have a beneficial impact on PTSD symptoms, dissociation and insomnia in patients with BPD and other personality disorders. Although one-third of the patients dropped out, no severe complications (e.g. suicidal behaviour or hospitalisation) occurred. RCTs are needed to further explore the efficacy of EMDR in patients with personality disorders.

ORCID

David P. G. van den Berg 🔟 http://orcid.org/0000-0002-8797-8217

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