Imagery rescripting and eye movement desensitisation and reprocessing as treatment for adults with post-traumatic stress disorder from childhood trauma: randomised clinical trial

Katrina L. Boterhoven de Haan, Christopher W. Lee, Eva Fassbinder, Saskia M. van Es, Simone Menninga, Marie-Louise Meewisse, Marleen Rijkeboer, Margriet Kousemaker and Arnoud Arntz

Background

Investigation of treatments that effectively treat adults with post-traumatic stress disorder from childhood experiences (Ch-PTSD) and are well tolerated by patients is needed to improve outcomes for this population.

Aims

The purpose of this study was to compare the effectiveness of two trauma-focused treatments, imagery rescripting (ImRs) and eye movement desensitisation and reprocessing (EMDR), for treating Ch-PTSD.

Method

We conducted an international, multicentre, randomised clinical trial, recruiting adults with Ch-PTSD from childhood trauma before 16 years of age. Participants were randomised to treatment condition and assessed by blind raters at multiple time points. Participants received up to 12 90-min sessions of either ImRs or EMDR, biweekly.

Results

A total of 155 participants were included in the final intent-to-treat analysis. Drop-out rates were low, at 7.7%. A generalised linear mixed model of repeated measures showed that observer-rated post-traumatic stress disorder (PTSD) symptoms significantly decreased for both ImRs ($d = 1.72$) and EMDR ($d = 1.73$) at the 8-week post-treatment assessment. Similar results were seen with secondary outcome measures and self-reported PTSD symptoms. There were no significant differences between the two treatments on any standardised measure at post-treatment and follow-up.

Conclusions

ImRs and EMDR treatments were found to be effective in treating PTSD symptoms arising from childhood trauma, and in reducing other symptoms such as depression, dissociation and trauma-related cognitions. The low drop-out rates suggest that the treatments were well tolerated by participants. The results from this study provide evidence for the use of trauma-focused treatments for Ch-PTSD.

Keywords

Post-traumatic stress disorder; childhood trauma; eye movement desensitisation and reprocessing; imagery rescripting; psychotherapy.

There is a lack of agreement on recommended best practice for treatment of adults with post-traumatic stress disorder from childhood experiences (Ch-PTSD).[1,2] The sequelae of childhood trauma, often being interpersonal in nature and involving multiple events over a prolonged period, can result in more difficult post-traumatic stress disorder (PTSD) presentations.[3] It is because of these experiences that there has been debate over whether the evidenced-based, trauma-focused approaches of PTSD treatments are appropriate for treating this population. The treatment debate is predicated on the assumption that individuals with Ch-PTSD do not have the capacity to tolerate the increased levels of distress often involved in processing their trauma experiences.[1,4] However, meta-analysis has identified individual trauma-focused therapies as the most effective treatment for Ch-PTSD.[5]

Exposure to trauma memories has been identified as a core component of PTSD treatments. Some treatments, such as cognitive–behaviour therapy, rely on prolonged reliving of traumatic events to enact symptomatic reduction,[6] whereas other trauma-focused treatments, such as imagery rescripting (ImRs) and eye movement desensitisation and reprocessing (EMDR), limit exposure to trauma memories. ImRs involves the patient imagining different outcomes related to their trauma experiences, with the focus on meeting the individual's core unmet needs. The process of rescripting facilitates changes to the meaning of the trauma memory, leading to changes in the patient's core beliefs systems and behaviours.[7] EMDR uses bilateral stimulation, such as eye movements or tapping, to facilitate processing of traumatic experiences. The result of the dual-attention focus is a reduction in the distress and vividness associated with trauma memories.[8] Although limited, there is evidence to suggest that both ImRs and EMDR can be effective in treating Ch-PTSD.[9,10] In addition, both of these treatments may be acceptable for patients, as treatment does not require prolonged reliving of trauma experiences to achieve a reduction in post-traumatic symptoms.[11,12] Both ImRs and EMDR only require exposure to activation of the trauma memory and then limit reliving past this point. ImRs does this by imagining a different outcome of the event,[7] and EMDR does this by distancing and free association.[13] These treatments have not been directly compared in this population. This randomised controlled trial (RCT) was designed to address the lack of any direct comparison of ImRs and EMDR in the treatment of Ch-PTSD.

Method

Study design

The ImRs and EMDR RCT (IREM) is an international collaboration with sites across Australia, Germany and the Netherlands. IREM was registered on the Australian and New Zealand Clinical Trials Registry under identifier ACTRN12614000750684. The full trial methodology is published elsewhere.[14] Research assistants were blind to treatment condition for the duration of the RCT. The full

trial protocol can be found in Supplementary File 1 available at https://doi.org/10.1192/bjp.2020.158.

Ethics approval and consent

The authors assert that all procedures contributing to this work comply with the ethical standards of the relevant national and institutional committees on human experimentation and with the Helsinki Declaration of 1975, as revised in 2008. All procedures involving human patients were approved by the respective institutional ethics committees in each country (approval numbers: University of Western Australia, RA/4/1/8727; Western Australia Department of Health, 2014067EW; Lübeck University, 14-274 and Maastricht University, ERCPN 136_01_01_2014). Informed written consent was obtained from all IREM participants.

Participants

Participants aged between 18 and 70 years could participate if they had experienced trauma before 16 years of age, either as a single event or a series of similar types of events. Participants were eligible if they had a primary diagnosis of PTSD related to their childhood trauma (index trauma), and symptoms had to be present for 3 months or more. Additional inclusion criteria included availability to attend sessions twice a week during the treatment period, and agree to no medication changes or any psychological therapy over the duration of their treatment until the first follow-up assessment (8 weeks post-treatment). Exclusion criteria were as follows: acute suicide risk, comorbid psychotic disorder, bipolar disorder type 1, alcohol or drug dependence (although a DSM-IV diagnosis of substance abuse was not an exclusion), PTSD from trauma occurring within the past 6 months, IQ < 80, medication changes or any PTSD-focused therapy within the past 3 months and benzodiazepine medication (although if patients agreed to taper off their benzodiazepine medication then they could participate after 2 weeks of abstinence).

Randomisation and masking

Randomisation of participants occurred after pre-treatment assessment, using block randomisation (at two, four and six per block, with block size randomised). Randomisation was stratified for gender to control distribution per treatment at each site. An error did occur in the randomisation for the first two sites, resulting in an early disproportionate, but still random, allocation to EMDR. Specifically, an error was made by an independent person in the randomisation at the first two sites that began the study (Perth and Lübeck), resulting in more participants assigned to EMDR. This occurred as the initial research assistant randomised participants before the pre-treatment assessment was completed. The mistake was detected by a site coordinator and the procedure was corrected. The error did not affect the other sites.

Procedures

Participants were recruited at seven mental health and specialised services across Australia, Germany and the Netherlands, from October 2014 to June 2019. Screening of potential participants involved assessment of psychiatric disorders with the Structured Clinical Interviews for DSM-IV-TR (SCID-IV)[15] or the Mini International Neuropsychiatric Interview,[16] depending on site preference; eligibility criteria; and trauma history with the Life Events Checklist for DSM-5,[17] including additional items to assess emotional abuse and emotional or physical neglect. Once eligibility was determined, participants were then scheduled to complete their initial assessment.

Assessments were a combination of interview and self-reported measures, which were conducted by research assistants who were blind to the treatment condition. Assessment time points included pre-treatment (just before the start of treatment), mid-treatment (after 6 sessions), post-treatment, follow-up assessment one (8 weeks post-treatment), and follow-up assessment two (1 year after pre-treatment assessment). Wait-list assessments were required if participants had a wait of ≥3 weeks before the commencement of treatment.

Outcomes

A priori planned primary outcome was change in PTSD symptom severity from pre-treatment to the first follow-up assessment, as measured by the Clinician-Administered PTSD Scale for DSM-5 (CAPS-5).[18] The CAPS-5 is a structured clinical interview rating the frequency and intensity of PTSD symptoms over the past month. The score range is 0–80, with higher scores reflecting greater PTSD symptom severity.

A secondary outcome of self-reported PTSD symptoms were assessed with the Impact of Events Scale-Revised (IES-R).[19] The IES-R has a score range of 0–88, with higher scores reflecting greater symptom severity. Four single items to assess trauma-related guilt, shame, anger and disgust were included in this self-report. The single items have a score range of 0–4, with higher scores reflecting greater symptom severity. The IES-R was collected twice at each time point with the index trauma (the event or series of events of the same type experienced before 16 years of age), and for all other traumas (any other trauma experienced across the lifetime). Self-reports were collected at each assessment point and treatment session. Session seven was used for the mid-treatment score. Additional secondary outcome measures included the Beck Depression Inventory II;[20] Dissociative Experiences Scale-Taxon;[21] Post-Traumatic Cognitions Inventory;[22] Trauma-Related Shame Inventory;[23] Trauma-Related Guilt Inventory,[24] with sum score of all items except the Distress and Lack of Justification sub-scales; Anger Expression and Control Scale,[25] with a composite score of anger minus control subscales; Hostility (six items), taken from the Symptoms Checklist-90-Revised;[26] World Database of Happiness;[27] World Health Organization Disability Assessment Schedule 2.0[28] and the Remoralization Questionnaire.[29]

Analysis of other secondary measures reported in the original trial protocol and design article, including the Imagery Interview[30] and the Schema Mode Inventory,[31] will be reported in different papers.

Ongoing monitoring of participant safety was conducted over the duration of the trial. Serious adverse events were recorded according to standard procedures and reported to the research board.

Treatment

Treatment comprised 12 90-min sessions twice a week, for a period of 6 weeks, with up to 8 weeks permitted. Participants were allowed to finish treatment before the 12 sessions if the site coordinator agreed that treatment was no longer necessary. In such cases, assessments were still conducted at the original planned time points. All treatment sessions were either video or audio recorded. Session one entailed an introduction to the treatment model and constructing a list of trauma memories for processing. In the ImRs condition, participants had a pilot rescripting of a less aversive (non-trauma) memory to become familiar with the technique. There was no pilot in the EMDR condition because of time constraints. In every subsequent session, trauma processing was required.

IREM therapists were licensed psychologists, psychotherapists, psychiatrists and a psychiatric nurse with advanced qualifications in mental health. Therapists were trained in one or both treatment

conditions. For ImRs, therapists were required to have basic training in cognitive–behavioural therapy, and for EMDR, they were required to have level 1 basic training. Both treatments required an additional 2 days of training in the respective treatment specifically for treating childhood trauma. Therapists had to demonstrate competency before treating participants in the IREM, with a minimum of two pilot cases, which were video recorded and assessed by the site coordinator. Therapists were provided with ongoing peer supervision throughout the RCT. Treatment integrity was assessed by raters who viewed randomly selected video tapes of 60 participants across the three countries. Each participant tape was rated on the modified EMDR Therapy Fidelity Rating Scale,[32] where each item is rated 0–2, and the ImRs Adherence and Competency Scale, where each item is rated 0–4. The mean rating for EMDR was 1.34 and the mean rating for ImRs was 3.19, which shows satisfactory adherence. Analysis of the rating scores for the Dutch participants indicated treatment conditions were statistically distinguishable from each other (EMDR condition $t_{78} = 14.93$, $P < 0.001$; ImRs condition $t_{85} = 17.25$, $P < 0.001$).

ImRs

The ImRs protocol developed by Arntz and Weertman was followed.[7] In phase one, the patient recalls a trauma memory from their child-self perspective, identifying their thoughts, feelings and needs. They are then guided to imagine a different ending, such as someone intervening by stopping the abuse and caring for the other needs of the child. For the first six treatment sessions, the therapist would enter the image and intervene. From session seven onward, the patient would step into the image as their adult self and intervene (phase two). In phase three, the patient re-experiences the event from the child perspective, with the adult intervening.

EMDR

The eight-phase EMDR protocol developed by Shapiro was followed.[8] The general assessment, preparation and key memory components of the first trauma to be processed (phases one, two and three), were incorporated into the first session. Phases three to eight, the active trauma processing phases, were repeated from session two onward. At session 12 or earlier, depending on patients' progress, the focus of the session was on current triggers and anticipatory anxiety related to future events. The only deviation to the original EMDR protocol was a restriction on unblocking strategies or interweaves involving imagery, to prevent contamination between treatments.

Statistical analysis

With $n = 128$, the study was powered at >80% to detect a medium effect size between arms at 8 weeks of follow-up, with a $P = 0.05$ two-tailed significance level. A participant drop-out rate of 10% was estimated, which took the final sample to a minimum of 142. Actual power was expected to be higher because of analysis of repeated measures with mixed regression.

Statistical analysis was done with SPSS, version 25 for Windows.[33] A generalised linear mixed model was used on all available data from the intent-to-treat sample. Skewed distributions were analysed with negative binomial (integers) or gamma regression (fractions) with a loglink. The repeated parts had an unstructured covariance structure (if convergence failed, AR1 or ARMA11 were used). If convergence allowed, random slope or intercept for site were added. The effects were estimated per assessment, with pre-treatment as the reference. Cohen's d effect sizes were based on the estimated coefficients, divided by the pre-treatment s.d. In case of loglinks, this s.d. was derived from the error variance of the pre-treatment of a generalised linear mixed model analysis,

with only an unstructured repeated part and a fixed intercept. The multi-site character of the trial was accounted for in the statistical analysis by a random factor for site. This allows for generalisation of the findings (sites are viewed as a sample of all treatment sites) and leads to valid standard errors in the fixed part, where the hypotheses are tested.

Results

Between October 2014 and June 2019, a total of 155 participants were recruited and treated as part of the IREM trial. Figure 1 presents the Consolidated Standards of Reporting Trials flow diagram of participant recruitment and Table 1 presents the demographics of the intent-to-treat sample. A total of 92 participants were assigned to the wait-list, with a mean wait period of 7.38 weeks (s.d. 3.91). Twelve (7.7%) participants dropped out of treatment, six (8.1%) from ImRs and six (7.4%) from EMDR, and eighteen (11.6%) participants completed treatment early, six (8.1%) from ImRs and twelve (14.8%) from EMDR. Participants' trauma experiences are reported in Table 1. Although most experienced their index trauma multiple times, 5 (6.8%) ImRs participants and 17 (21.0%) EMDR participants experienced their trauma once only.

Analyses of the primary and secondary outcome measures are summarised in Supplementary Table 1. The primary outcome of participants' PTSD symptoms, assessed by the CAPS-5, did not change during the wait-list period, but significantly decreased during treatment and these gains were maintained until the 1-year follow-up assessment. Effect sizes were large in both treatment conditions. Figure 2 presents CAPS-5 scores at each assessment point. There were no significant time×condition interactions. In terms of diagnosis, 93% met the diagnostic criteria for PTSD according to CAPS-5 criteria at the wait-list assessment (all participants met the criteria for PTSD at the initial screening as assessed with the SCID-IV, but the CAPS-5 is based on DSM-5 criteria, which can lead to different diagnostic conclusions than the DSM-IV), 68% of participants no longer met the criteria at the first follow-up point, and this improved to 81% at the 1-year follow-up assessment.

Secondary outcomes, including self-reported PTSD, depression, dissociation, trauma cognitions, guilt, shame, anger, hostility, psychosocial functioning and happiness, had similar results, with no significant changes during the wait period and significant reductions in symptoms after treatment started. As can be seen in Supplementary Table 1, there were some significant time×condition interactions at the mid-treatment assessment, with EMDR resulting in significantly lower scores (using <0.01) on three measures. These interactions were no longer statistically significant at post-treatment and follow-up assessments.

Four serious adverse events were reported, with two of these deemed by participants as being partly study related. Both participants reported an increase in PTSD symptoms and suicidal ideation resulting in psychiatric admission, one after session six and the other after session twelve, which occurred after experiencing another trauma (road accident). Of the two who reported adverse events that were not study related, one had an in-patient admission after a long-term relationship break-up after the wait-list assessment but before the start of treatment, and the other was admitted to hospital after losing their job, 4 months after completing treatment.

Discussion

The purpose of this international RCT was to investigate the effectiveness of ImRs and EMDR for the treatment of individuals with Ch-PTSD. IREM results showed that both treatments were effective
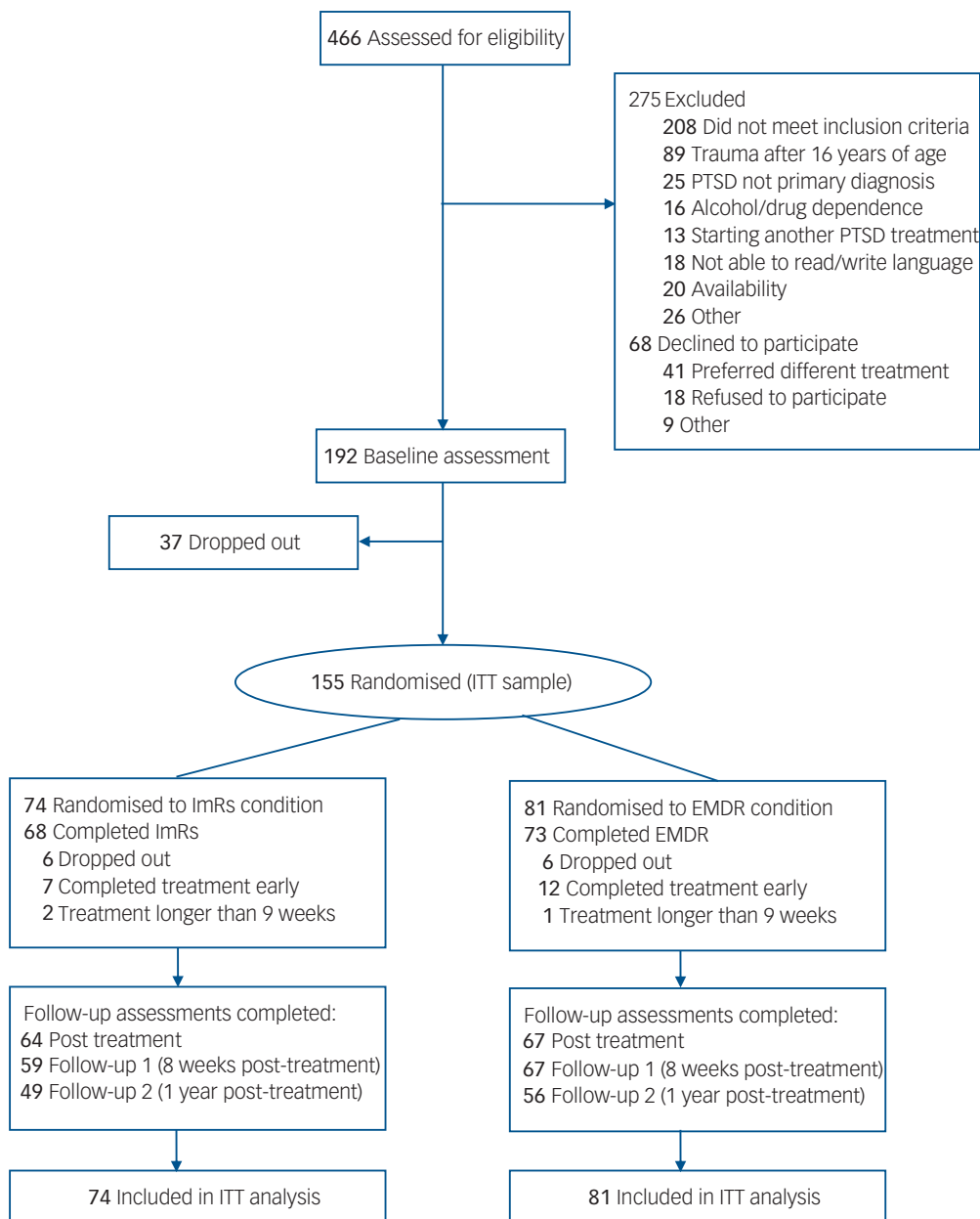
Fig. 1 CONSORT diagram of participant flow. CONSORT diagram comparing imagery rescripting (ImRs) and eye movement desensitisation and processing (EMDR) for patients with post-traumatic stress disorder (PTSD) from trauma experienced before 16 years of age.

ITT, intent-to-treat sample; CONSORT, Consolidated Standards of Reporting Trials.

in reducing PTSD symptoms, depression, dissociation, trauma-related cognitions, shame, guilt and hostility, with treatment gains increasing over time. There were no differences between the treatments on the primary outcome at any time point and only three significant (at 0.01 level) differences for secondary outcomes, all at the mid-treatment point and favouring EMDR. These differences were no longer present at post-treatment and follow-up assessments. Given the number of comparisons and the multiple assessment points, the difference between the treatments was minimal. The size of treatment effects between baseline and the 1-year follow-up assessment were very large, with 2.26 for ImRs and 1.88 for EMDR on the CAPS-5, and the treatment drop-out rate of 7.7% was also very low. This pre-post effect size and drop-out rate compares favourably to other studies that have investigated the effect of treatment on PTSD from childhood. A meta-analysis of trauma-focused treatments for adult survivors of childhood abuse found an average pre-post effect size of 1.24 and an average drop-out rate of 22%.[5]

IREM results contribute to the growing evidence that suggests it is acceptable to directly treat trauma in more difficult PTSD presentations, such as individuals with childhood trauma experiences.[5] IREM findings were not consistent with the views of researchers who advocate that an initial stabilisation phase is necessary to improve patients' functioning and capacity to tolerate trauma processing.[4,34] This approach has been criticised as lacking empirical support.[1] Our findings also do not support this view, with most IREM participants having extensive trauma histories and comorbid disorders: treatment did result in significant and sustained symptom reduction and was well tolerated, as indicated by the low drop-out rate.

Table 1 Demographic characteristics of the IREM intent-to-treat sample

| Characteristic	Treatment condition, n (%) of patients[a]		
	All (N = 155)	ImRs (n = 74)	EMDR (n = 81)
Age, mean (s.d), years	38.54 (11.17)	38.08 (10.85)	38.96 (11.51)
Gender			
Male	36 (23.2)	20 (27.0)	16 (19.8)
Female	119 (76.8)	54 (73.0)	65 (80.2)
Relationship status			
Partner	96 (61.9)	48 (64.9)	48 (59.3)
No partner	59 (38.1)	26 (35.1)	33 (40.7)
Education level			
No/primary education	8 (5.2)	6 (8.1)	2 (2.5)
Secondary education	45 (29.0)	18 (24.3)	27 (33.3)
Tertiary/vocational Education	88 (56.8)	42 (56.8)	46 (56.8)
University Bachelor/Masters	14 (9.1)	8 (10.8)	6 (7.4)
Ethnic background			
Dutch	60 (38.7)	31 (41.9)	29 (35.8)
German	21 (13.5)	8 (10.8)	13 (16.0)
Australian	37 (23.9)	14 (18.9)	23 (28.4)
Other European	8 (5.2)	3 (4.1)	5 (6.2)
Moroccan	10 (6.5)	7 (9.5)	3 (3.7)
Surinamese/Antillean	8 (5.2)	4 (5.4)	4 (4.9)
Asian	6 (3.9)	4 (5.4)	2 (2.5)
Other	5 (3.2)	3 (4.1)	2 (2.5)
Work status			
Working	63 (40.7)	29 (39.2)	34 (42.0)
Not working	21 (13.5)	10 (13.6)	11 (13.5)
Disability pension	54 (34.8)	28 (37.9)	26 (32.0)
Unemployed	17 (11.0)	7 (9.5)	10 (12.3)
Index traumas			
Sexual abuse/assault	91 (58.7)	36 (48.6)	55 (67.9)
Physical abuse	31 (20.0)	15 (20.3)	16 (19.8)
Mixed abuse	8 (5.2)	6 (8.1)	2 (2.5)
Domestic violence	14 (9.0)	9 (12.2)	5 (6.2)
Serious injury/death	6 (3.9)	4 (5.4)	2 (2.5)
Other	5 (3.2)	4 (5.5)	1 (1.2)
Index trauma duration, mean (s.d.), years	7.22 (4.92)	7.59 (5.20)	6.79 (4.60)
Index trauma onset, mean (s.d.), years	7.95 (4.17)	7.77 (4.21)	8.12 (4.16)
Index trauma frequency, quartiles 1–3	19.5–546	18.75–663	19.5–476
PTSD duration, mean (s.d.), months	215.26 (175.08)	212.18 (176.71)	218.07 (174.63)
Comorbid disorder			
Mood disorders	111 (71.6)	54 (73.0)	57 (70.4)
Anxiety disorders	87 (56.1)	38 (51.4)	49 (60.5)
Other	39 (25.2)	16 (21.6)	23 (28.4)
Previous treatment	126 (81.3)	62 (83.8)	64 (79.0)
Previous psychiatric admission	39 (25.2)	16 (21.6)	23 (28.4)
Current medication	71 (45.8)	30 (40.5)	41 (50.6)
Alcohol or substance Use	84 (54.2)	36 (48.6)	48 (59.3)

ImRs, imagery rescripting; EMDR, eye movement desensitisation and reprocessing; PTSD, post-traumatic stress disorder.
a. Percentages have been rounded and may not total 100.

We found that both ImRs and EMDR were effective without the need for prolonged exposure. This is consistent with other studies that have suggested that limited exposure to trauma memories is required to achieve symptomatic reduction.[11,35] The treatment process of ImRs and EMDR reduce the burden on both patients and therapists, as individuals are not required to relive their trauma experiences in great detail.

The IREM protocol utilised intensive treatment, with sessions offered twice a week. More intensive interventions have been hypothesised to be suitable for certain populations, such as those with complex forms of PTSD, as it facilitates treatment engagement and helps overcome avoidance.[36] Indeed, the accompanying qualitative study yielded positive evaluations of the present format by patients and therapists.[14] The hypothesis that twice a week is superior to once a week for EMDR and ImRs is currently being tested in an RCT (see Netherlands Trial Register identifier NTR7153).

Strengths and limitations

A limitation of this study was that the treatments were not compared with other evidence-based treatments for PTSD and there was no non-active control group. Since the study was designed as an effectiveness study and not an efficacy study, a control group would endanger the representativeness of the treatment group by increasing patients' resistance to participate. However, the fact that there were no significant changes during the wait-list period makes it unlikely that the observed improvements are because of nonspecific factors, such as time. The EMDR protocol restricted therapists use of therapeutic interweaves specifically imagery-based interventions to prevent contamination of conditions. As such, the treatment delivery of EMDR could be considered as suboptimal. However, therapists were able to use all other interweaves. The extent that this effected the results is difficult to say without an empirical test. The pre-post effect size in the current study was higher than that reported in other EMDR treatment studies
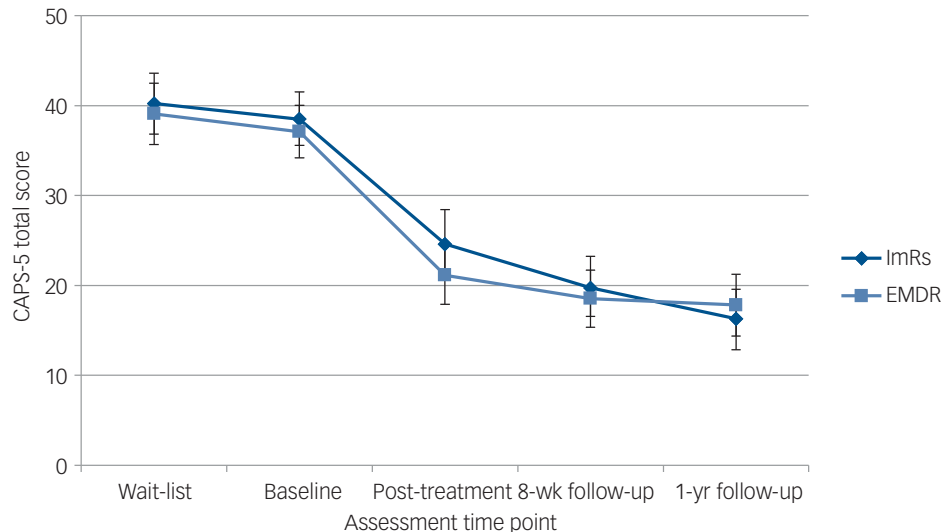
Fig. 2 Change in post-traumatic stress disorder symptoms scores (CAPS-5) by treatment condition at each assessment time point.

Error bars indicate 95% confidence interval. CAPS-5, Clinician-Administered PTSD Scale for DSM-5; EMDR, eye movement desensitisation and reprocessing; ImRs, imagery rescripting.

(Cohen's $d = 1.64$ pre-post and 1.99 follow-up).[36] Future research could test this variation in the same population.

Individuals with Ch-PTSD are often found to have comorbid presentations and therefore the exclusion criterion of alcohol and drug dependence used might not adequately represent this population (although a DSM-IV diagnosis of substance abuse was not excluded). In comparison with other studies, our participants would still be considered as presenting with severe PTSD, with 34% on a disability pension. More research is needed for patients with alcohol or drug dependence and PTSD.

Our study had a large percentage of female participants. This was found to be consistent with other studies where the majority of participants were female. The block randomisation process sought to balance gender across the two conditions so the gender was not likely to have a systemic differential effect on each treatment.

We identified an issue with our randomisation early in the trial and this issue could have potentially created a bias in the learning curve of the therapists. EMDR was overrepresented by early treatments at two sites. However, we did correct this issue early and there was only a slight unbalance. This is unlikely to have a significant effect on our findings.

This study has several strengths. In the treatment of Ch-PTSD, this is the first study to directly compare EMDR and ImRs. In addition, it is the first large-scale RCT where ImRs has been trialled for treatment of Ch-PTSD. The lack of significant between group treatment effects indicates that both treatments are effective for treating Ch-PTSD. The rigorous design of this RCT, using a large international sample, recruiting participants from regular mental health treatment centres and the long-term follow-up period provides evidence for the effectiveness of these treatments, and increases generalisability of our results. This research makes an important contribution in developing evidenced-based treatments for Ch-PTSD.

Katrina L. Boterhoven de Haan (ID), Faculty of Health and Medical Sciences, University of Western Australia, Australia; **Christopher W. Lee**, Faculty of Health and Medical Sciences, University of Western Australia, Australia; **Eva Fassbinder**, Department of Psychiatry and Psychotherapy, University of Lübeck, Germany; **Saskia M. van Es**, PsyQ Amsterdam, Parnassia Group, the Netherlands; **Simone Menninga**, PsyQ Beverwijk, Parnassia Group, the Netherlands; **Marie-Louise Meewisse**, Abate, Centre of Expertise in Anxiety and Psychotrauma, the Netherlands; **Marleen Rijkeboer**, Department of Clinical Psychological Science, Faculty of Psychology and Neuroscience, Maastricht University, the Netherlands; **Margriet Kousemaker**, Amstelveen, Sinai Centrum, the Netherlands; **Arnoud Arntz**, Department of Clinical Psychology, University of Amsterdam, the Netherlands

Correspondence Katrina L. Boterhoven de Haan. Email: katrina.boterhovendehaan@research.uwa.edu.au

First received 4 Mar 2020, final revision 22 Jul 2020, accepted 29 Jul 2020

Supplementary material

Supplementary material is available online at https://doi.org/10.1192/bjp.2020.158.

Data availability

Acknowledgements

Author contributions

K.L.B.d.H. was involved in the development of the study protocol and was responsible for recruitment of participants and management of the Australian site, data cleaning and analysis, drafting the main body of the manuscript, revising the manuscript following feedback and submission of manuscript. C.W.L. was responsible for the initial conception and design of the study, was involved in the development of the study protocol, was the EMDR expert, handled data cleaning and analysis and provided critical revision of the article. E.F. was involved in the development of the study protocol, was responsible for the recruitment of participants and management of the German site and provided critical revision of the article. S.M.v.E. was involved in the development of the study protocol, was responsible for recruitment of participants and management of a Dutch site and provided critical revision of the article. M.-L.M. was involved in the development of the study protocol, was responsible for recruitment of participants and management of a Dutch site and provided critical revision of the article. S.M. was involved in the development of the study protocol, was responsible for recruitment of participants and management of a Dutch site and provided critical revision of the article. M.R. was involved in the development of the study protocol, was responsible for recruitment of participants and management of a Dutch site and provided critical revision of the article. M.K. was involved in the development of the study protocol, was responsible for recruitment of participants and management of a Dutch site and provided critical revision of the article. A.A. was Principal Investigator for the study, was responsible for initial conception and design of the study and development of the study protocol, was the ImRs expert, handled data cleaning

References

1 de Jongh A, Resick PA, Zoellner LA, van Minnen A, Lee CW, Monson CM, et al. Critical analysis of the current treatment guidelines for complex PTSD in adults. *Depress Anxiety* 2016; **33**: 359–69.

2 Cloitre M, Courtois CA, Charuvastra A, Carapezza R, Stolbach BC, Green BL. Treatment of complex PTSD: results of the ISTSS expert clinician survey on best practices. *J Trauma Stress* 2011; **24**: 615–27.

3 Herman JL. Complex PTSD: a syndrome in survivors of prolonged and repeated trauma. *J Trauma Stress* 1992; **5**: 377–91.

4 Cloitre M, Courtois C, Ford J, Green B, Alexander P, Briere J, et al. *The ISTSS Expert Consensus Treatment Guidelines for Complex PTSD in Adults*. ISTSS, 2012.

5 Ehring T, Welboren R, Morina N, Wicherts JM, Freitag J, Emmelkamp PMG. Meta-analysis of psychological treatments for posttraumatic stress disorder in adult survivors of childhood abuse. *Clin Psychol Rev* 2014; **34**: 645–57.

6 Foa EB, Davidson JRT, Frances A. The expert consensus guideline series: treatment of posttraumatic stress disorder. *J Clin Psychiatry* 1999; **60**: 4–76.

7 Arntz A, Weertman A. Treatment of childhood memories: theory and practice. *Behav Res Ther* 1999; **37**: 715–40.

8 Shapiro F. *Eye Movement Desensitization and Reprocessing: Basic Principles, Protocols, and Procedures* (2nd edn). Guildford Press, 2001.

9 Raabe S, Ehring T, Marquenie L, Olff M, Kindt M. Imagery rescripting as stand-alone treatment for posttraumatic stress disorder related to childhood abuse. *J Behav Ther Exp Psychiatry* 2015; **48**: 170–6.

10 Edmond T, Rubin A. Assessing the long-term effects of EMDR: results from an 18-month follow-up study with adult female survivors of CSA. *J Child Sex Abus* 2004; **13**: 69–86.

11 Arntz A. Imagery rescripting as a therapeutic technique: review of clinical trials, basic studies, and research agenda. *J Exp Psychopathol* 2012; **3**: 189–208.

12 Korn DL. EMDR and the treatment of complex PTSD: a review. *J EMDR Pract Res* 2009; **3**: 264–78.

13 Lee CW, Taylor G, Drummond PD. The active ingredient in EMDR: is it traditional exposure or dual focus of attention? *Clin Psychol Psychother* 2006; **13**: 97–107.

14 Boterhoven de Haan KL, Lee CW, Fassbinder E, Voncken MJ, Meewisse M, Van Es SM, et al. Imagery rescripting and eye movement desensitisation and reprocessing for treatment of adults with childhood trauma-related post-traumatic stress disorder: IREM study design. *BMC Psychiatry* 2017; **17**: 165.

15 First M, Spitzer R, Gibbon M, Williams J. *Structured Clinical Interview for DSM-IV Axis I Disorders-Patient Edition (SCID-I/P, Version 2.0)*. Biometrics Research Department, New York State Psychiatric Institute, 1995.

16 Sheehan DV, Lecrubier Y, Harnett Sheehan K, Janavs J, Weiller E, Keskiner A, et al. The validity of the Mini International Neuropsychiatric Interview (MINI) according to the SCID-P and its reliability. *Eur Psychiatry* 1997; **12**: 232–41.

17 Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane TM. The Life Events Checklist for DSM-5 (LEC-5). National Center for PTSD, 2013 (https://www.ptsd.va.gov/professional/assessment/te-measures/life_events_check-list.asp).

18 Weathers FW, Blake DD, Schnurr PP, Kaloupek DG, Marx BP, Keane TM. The Clinician-Administered PTSD Scale for DSM–5 (CAPS-5). National Center for PTSD, 2013 (https://www.ptsd.va.gov/professional/assessment/adult-int/caps.asp).

19 Weiss D, Marmar C. The Impact of Event Scale-Revised. In *Assessing Psychological Trauma and PTSD* (eds J Wilson, T Keane). Guildford Press, 1997.

20 Beck AT, Steer R, Brown G. *Manual for the Beck Depression Inventory-II*: 1–38. The Psychological Corporation, 1996.

21 Waller N, Putnam FW, Carlson EB. Types of dissociation and dissociative types: A taxometric analysis of dissociative experiences. *Psychol Methods* 1996; **1**: 300–21.

22 Foa EB, Ehlers A, Clark DM, Tolin DF, Orsillo SM. The Posttraumatic Cognitions Inventory (PTCI): development and validation. *Psychol Assess* 1999; **11**: 303–14.

23 Øktedalen T, Hagtvet K, Hoffart A, Langkaas T, Smucker M. The Trauma Related Shame Inventory: measuring trauma-related shame among patients with PTSD. *J. Psychopathol Behav Assess* 2014; **36**: 600–15.

24 Kubany ES, Haynes SN, Abueg FR, Manke FP, Brennan JM, Stahura C. Development and validation of the Trauma-Related Guilt Inventory (TRGI). *Psychol Assess* 1996; **8**: 428–44.

25 van Elderen T, Maes S, Komproe I, van der Kamp L. The development of an Anger Expression and Control Scale. *Br J Health Psychol* 1997; **2**: 269–81.

26 Derogatis LR, Unger R. *Symptom Checklist-90-Revised. The Corsini Encyclopedia of Psychology*. John Wiley & Sons, 2010.

27 Veenhoven R. *World Database of Happiness*. Erasmus University Rotterdam, 2011 (http://worlddatabaseofhappiness.eur.nl/hap_quer/hqs_fp.htm).

28 World Health Organization (WHO). *World Health Organization Disability Assessment Schedule WHODAS II*. WHO, 2000.

29 Vissers W, Keijsers GPJ, van der Veld WM, de Jong AJ, Hutschemaekers GJM. Development of the Remoralization Scale. *Eur J Psychol Assess* 2010; **26**: 293–301.

30 Wild J, Hackmann A, Clark DM. When the present visits the past: updating traumatic memories in social phobia. *J Behav Ther Exp Psychiatry* 2007; **38**: 386–401.

31 Lobbestael J, van Vreeswijk M, Spinhoven P, Schouten E, Arntz A. Reliability and validity of the short Schema Mode Inventory (SMI). *Behav Cogn Psychother* 2010; **38**: 437–58.

32 Cooper RZ, Smith AD, Lewis D, Lee CW, Leeds AM. Developing the interrater reliability of the modified EMDR Fidelity Checklist. *J EMDR Pract Res* 2019; **13**: 32–50.

33 IBM Corp. *IBM SPSS Statistics for Windows*. 25.0 ed. IBM Corp, 2017 (https://www.ibm.com/au-en/products/spss-statistics).

34 Cloitre M, Stovall-McClough KC, Nooner K, Zorbas P, Cherry S, Jackson CL, et al. Treatment for PTSD related to childhood abuse: a randomized controlled trial. *Am J Psychiatry* 2010; **167**: 915–24.

35 Sloan DM, Marx BP, Lee DJ, Resick PA. A brief exposure-based treatment vs cognitive processing therapy for posttraumatic stress disorder: a randomized noninferiority clinical trial. *JAMA Psychiatry* 2018; **75**: 233–9.

36 Van Woudenberg C, Voorendonk EM, Bongaerts H, Zoet HA, Verhagen M, Lee CW, et al. Effectiveness of an intensive treatment programme combining prolonged exposure and eye movement desensitization and reprocessing for severe post-traumatic stress disorder. *Eur J Psychotraumatol* 2018; **9**: 1487225.

EXTRA CONTENT ONLINE