The Current Status of EMDR Therapy, Specific Target Areas, and Goals for the Future

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While eye movement desensitization and reprocessing (EMDR) is considered an evidence-based treatment for posttraumatic stress disorder (PTSD) in adults, there are differences as to how various international treatment guidelines judge the strength of this evidence base. Furthermore, in areas other than adult PTSD, major guidelines differ even more as to the strength of the evidence base and when to use EMDR. In 2019, the Council of Scholars: The Future of EMDR Therapy Project was initiated. Several working groups were established, with one assigned to the focus area of research. This article is a product of that working group. Firstly the group concluded that there were five areas where there was some base that EMDR was effective, but more data were needed to increase the likelihood that it would be considered in future international treatment guidelines. These areas were PTSD in children and adolescents, early EMDR interventions, combat PTSD, unipolar depression, and chronic pain. In addition, research into cost-effectiveness of EMDR therapy was identified as one of the priorities. A hierarchical system was used for classifying and rating evidence in the focus areas. After assessing the 120 outcome studies pertaining to the focus areas, we conclude that for two of the areas (i.e., PTSD in children and adolescents and EMDR early interventions research) the strength of the evidence is rated at the highest level, whereas the other areas obtain the second highest level. Some general recommendations for improving the quality of future research on the effectiveness of EMDR therapy are formulated.

Keywords: eye movement desensitization and reprocessing (EMDR) therapy; pediatric posttraumatic stress disorder (PTSD); early EMDR interventions; combat PTSD; depression; chronic pain

Since the first published study of Francine Shapiro in 1989, the results of more than 30 RCTs investigating the effectiveness of eye movement desensitization and reprocessing (EMDR) therapy on posttraumatic stress disorder (PTSD) have been published (De Jongh et al., 2019). The positive outcomes reported in these studies have led to the inclusion of EMDR therapy as one of the first-choice treatments for PTSD in most international treatment guidelines. Remarkably, these guidelines differ in the importance they attach to EMDR therapy as a first-choice treatment. For example, while the International Society of Traumatic Stress Studies (ISTSS, 2019) strongly recommends the use of EMDR therapy as a treatment for PTSD both in adults and in children, the American Psychological Association (APA) recommends only its conditional use in adult patients (APA, 2017). Likewise, the National Institute for Health and Care Excellence (NICE) guidelines recommend EMDR therapy for adults with PTSD, but not if PTSD is combat related and conditionally as a therapy for children with PTSD (NICE, 2018). Reviews of the various treatment guidelines attributed the differences in recommendations to the time period of the reviews; the inclusion criteria that were used; and methodological issues within the studies such as the choice of measures, the demanded proportion of patients diagnosed with PTSD in the included studies, and the required sample size (Dominguez & Lee, 2019; Hamblen et al., 2019). Yet, in all but one recent treatment guideline, treatment of adult PTSD with EMDR was given the highest rating level for degree of empirical support for the effectiveness of EMDR therapy in the treatment of adult PTSD.

In 2019, the Council of Scholars: The Future of EMDR Therapy Project was initiated. Within this council, several working groups were set up to allocate tasks to cover different areas of EMDR practice. One of those working groups was assigned to focus on research. The research working group considered that, while treatment-based guidelines have accepted EMDR therapy as an evidence-based treatment for adult PTSD, there is emerging evidence for EMDR as a treatment for other mental health conditions and target groups. However, the current evidence for these conditions may not yet be sufficient for EMDR therapy to be included in the practice guidelines on these areas. The research working group identified five such pertinent areas: PTSD in children and adolescents, early EMDR interventions, combat PTSD, unipolar depression, and chronic pain. Furthermore, the cost-effectiveness of EMDR was indicated as another important focus area. According to the research group, these areas should be a focus of research collaborations and preferably funding to increase the likelihood for EMDR therapy of being evaluated for inclusion in relevant treatment guidelines.

The purpose of the present position article was to provide an overview of the research on EMDR therapy in these specific target areas. We sought to identify every research study published in the five target areas, by using common search engines such as PsycINFO and PubMed, and by

TABLE 1. Levels of Evidence Based on Sackett (1989)

Level	Type of Evidence
I	Large RCTs with clear-cut results
II	Small RCTs with unclear results
III	Cohort and case-control studies
IV	Historical cohort or case-control studies
V	Case series, studies with no controls

examining the bibliographies of review articles and meta-analyses to ensure that no study was overlooked. We identified a total of 120 studies. There were 25 studies for children and adolescents with PTSD, 23 studies for EMDR early interventions, 24 for combat PTSD, 23 for unipolar depression, 23 for pain, and two for cost-effectiveness (see Appendices A-E).

For our analysis, we used a simple hierarchical system of classifying and rating evidence developed by Sackett (1989; see Table 1). This system ranks studies placing large RCTs at the highest level and case series or expert opinions at the lowest level of evidence. This system enables an assessment of the current strength of the evidence regarding these target areas so that we can make targeted recommendations and set priorities for future research.

Below is an overview of the aforementioned research areas in terms of the amount and type of studies. Then we evaluate the overall body of evidence, identify existing research gaps, and determine priorities for research in each area.

EMDR for PTSD in Children and Adolescents

We identified a total of 25 studies that investigated the efficacy of individual EMDR therapy for children and adolescents with PTSD (symptoms). These included 11 RCTs and six case series/studies for individual EMDR therapy, and two RCTs and six case studies for group EMDR treatment. The ten RCTs for individual EMDR therapy resulted in a Sackett Level I rating (see Appendix A for an overview and specifics of the studies). Four of these RCTs compared EMDR therapy with a waitlist control condition, two with standard care, and one with a control group. Five RCTs compared EMDR therapy (also) with trauma-focused cognitive behavior therapy (CBT). The sample sizes in the studies ranged from 19 to 139 participants covering an age range of 4–18 years. Only two studies included children of preschool age. All but one study found EMDR therapy to be associated with a significant reduction of PTSD symptoms or a loss of PTSD diagnosis compared to either a waitlist control group, psychoeducation, or standard care within a small number of sessions (three to nine sessions). An exception was the study of Meentken et al. (2020) that showed superior effects of EMDR therapy compared to care as usual for child-reported symptoms of blood–injection–injury phobia, depression, and sleep problems, albeit not for PTSD symptoms. Although the five studies that compared EMDR therapy to trauma-focused CBT showed both therapies equally effective, there is preliminary support (four studies) for the notion that EMDR therapy achieved improvement in fewer sessions than trauma-focused CBT. In addition to reductions of PTSD symptoms and loss of PTSD diagnoses, five studies indicate that EMDR therapy may also be effective in reducing comorbid symptoms such as depression, anxiety, and behavioral problems. Furthermore, six nonrandomized controlled studies have been published on individual EMDR therapy for children and youth. Three were nonrandomized controlled studies and three were uncontrolled extended case studies (see Appendix A), all showing significant reductions of PTSD symptoms.

Regarding EMDR group therapy (> 3 months post-trauma; for studies <3 months post-trauma see the overview of early intervention studies), two RCTs were conducted and six case series or uncontrolled studies were published. Sample sizes ranged from eight to 184, including children and adolescents aged 3–22 years. In the RCTs EMDR group therapy was compared with a no-treatment control condition, showing that the EMDR group therapy was more effective than no treatment in reducing symptoms of PTSD, anxiety, and depression with results maintained at 3-month follow-up. The results of the group case series and noncontrolled studies were in line and showed decreases of PTSD symptoms, and where measured reductions of symptoms of depression and anxiety.

Treatment Guidelines

Despite the significant positive results regarding EMDR therapy in children and adolescents with PTSD, there are differences among the international guidelines with respect to the recommendations for EMDR therapy. Although the ISTSS (2019) and the World Health Organization (WHO, 2013) positively recommended EMDR therapy for pediatric PTSD, the NICE guidelines (NICE, 2018) suggested conditional

use of EMDR therapy, and recommended providing EMDR therapy only in cases where children do not respond to or engage with trauma-focused CBT. This decision was based on the NICE highlighting insufficient RCTs with children. As the NICE guidelines (NICE, 2018) and meta-analyses on EMDR for pediatric PTSD (e.g., Brown et al., 2017; Moreno-Alcázar et al., 2017) have emphasized, most of the empirical studies to date suffer from methodological limitations and a high risk of bias. Although two of the RCTs were large ($N > 100$), most studies made use of small sample sizes (ranging from 19 to 74). Further methodological limitations are the absence of a diagnostic clinical PTSD interview, missing long-term follow-up assessments, and appropriate treatment fidelity checks. Such methodological limitations reduce reviewers' confidence in the reliability and validity of the outcomes.

Research Priorities

To improve the reliability and validity of EMDR therapy in this target group, more methodologically rigorous RCTs are required with larger samples, comparisons to waitlist condition, and/or active control groups (such as trauma-focused CBT or KIDNET). In addition, more research is needed to determine the effectiveness of EMDR therapy in children aged 4–18 years, in preschoolers (aged 0–4), and in youth with multiple traumatic events and who present with complex PTSD. Research is also needed to compare the effect of weekly versus more intensive EMDR treatment for PTSD in children and adolescents and to assess cost-effectiveness of EMDR therapy for pediatric PTSD.

EMDR as an Early Intervention

In the traumatic stress field, interventions have been considered early when treatment is initiated within 3 months after a traumatic event occurred (ISTSS, 2019). These early interventions aim to treat symptoms associated with PTSD and also to prevent the development of PTSD and other disorders.

Twenty-three studies have investigated the efficacy of EMDR early interventions. These include eight RCTs, four (historical) case/cohort controlled studies, and 11 case studies. In terms of Sackett criteria, there are eight RCTs, which are sufficient studies to earn a Level I rating (see Appendix B). Four RCTs compared EMDR therapy to delayed treatment. Three additional studies compared EMDR therapy with critical incident stress debriefing, supportive counseling, or with reassurance. Sample sizes ranged from 16 to 130. Furthermore, 16 non-RCT EMDR early intervention studies have been published; two were nonrandomized controlled studies, two were nonrandomized historical controls, and 12 were case series or uncontrolled studies. In addition to significant reductions of PTSD symptoms that were maintained at follow-up, overall the studies provide support for the notion that early EMDR therapy intervention may also be effective in ameliorating symptoms of depression or anxiety.

Treatment Guidelines

The main treatment guidelines vary widely in their definitions of early intervention and in their recommendations for EMDR therapy as an early intervention. The WHO Guidelines for Adults (WHO, 2013), in accordance with *DSM-5*, only considered treatment early when it was given in the first month post-trauma. As only one EMDR RCT was available when the WHO early intervention guidelines were completed, EMDR was not recommended for early intervention. Standard recommendations for EMDR following the first month were made with moderate evidence. Conversely, the NICE guidelines (NICE, 2018) considered early interventions over two time periods: interventions within the first month which were labeled as prevention, and PTSD treatment during the following 2 months. Of all available EMDR early intervention RCTs at that time, only two were identified or included in the analyses of NICE. They did not recommend EMDR early intervention for prevention in the first month, and only recommended considering EMDR therapy for nonmilitary trauma during months 2 or 3, if the client requested EMDR. The ISTSS (2019) similarly considered the category of early interventions as treatment provided within the first 3 months, but made a distinction between single-session interventions and multiple-session interventions. These treatment guidelines included most of the available EMDR early intervention RCTs. The ISTSS guidelines gave a strong recommendation for multiple-session EMDR intervention for adults during the first 3 months after experiencing trauma. They also recognized an EMDR single-session intervention as having emerging evidence. Although the pre–post effect sizes in these studies were large, the poor methodological quality of the studies led to doubt about the certainty of the estimate. Identified methodological limitations included heterogeneity, small sample size, and risk of bias. In general, for wider inclusion in the guidelines as early intervention, studies need to be conducted within 3 months and

adhere to high and clear research standards such as the Consort guidelines.

Research Priorities

Despite the Sacket Level I rating there are still noticeable gaps in the current EMDR early intervention evidence base. These suggest the need for RCTs with larger sample sizes, with children and adolescents, and with group interventions. In addition to studies conducted after 1 month, but within 3 months posttrauma, there is a need for studies that treat trauma symptoms within 1 month and with single-session treatment. Research is needed to evaluate prevention of PTSD, with clinician-administered diagnostic measures (e.g., CAPS-5) administered to treated and nontreated individuals. Other areas of interest are investigating the effect EMDR early intervention may have on (preventing) other disorders and on (increasing) resilience. The research priority for EMDR early intervention studies can be stressed even more considering the current COVID-19 pandemic, in which large groups are traumatized.

Combat-Related PTSD

Among military populations, PTSD is a common, debilitating condition which results in a significant public heath challenge (Steenkamp et al., 2015). Military populations typically present with multiple traumatic events, complex trauma symptoms, and PTSD accompanied by specific concerns. These include fear of forgetting and thereby not honoring the dead, and a sense of over-responsibility of their role in combat, with associated guilt, shame, anger, complicated grief, and feeling powerless (Alliger-Horn et al., 2016; Litz et al., 2009; Turgoose & Murphy, 2018). There may also be secondary gain issues related to ongoing financial support (McNally, 2003), chronic pain (Gironda et al., 2016), substance use or dependence (Milliken et al., 2007), and suicide risk (Sayer et al., 2014).

Although there are 24 studies that examined EMDR treatment with combat PTSD, the current state of the EMDR literature (see Appendix C) suggests a Sacket rating of level II as there are only six RCTs that are quite small in size. In addition to these RCTs there are four nonrandomized controlled studies, three nonrandomized historical controlled studies, and 11 case series or uncontrolled studies. Five of the six RCTs compared EMDR to an active control, including biofeedback and/or relaxation, EMDR without eye movements, REM desensitization, and stress inoculation with prolonged exposure. The nonactive controls in the six RCTs were no treatment (two studies), waitlist (two studies), or standard care (two studies). Sample sizes ranged from 20 to 51. Only one of the RCTs provided a full course of EMDR therapy (12 sessions), which led to significant improvements compared to biofeedback relaxation and routine care on PTSD measures. Results for EMDR participants indicated that at 3-month follow-up, 78% of the EMDR group no longer met criteria for PTSD, compared to 22% in the biofeedback condition. Outcomes on three of the other RCTs also indicated significant effects of EMDR on PTSD outcome measures at posttreatment, while two other studies, which provided two EMDR sessions to Vietnam veterans, reported no change in PTSD measures pre- to posttreatment.

Treatment Guidelines

In line with international treatment guidelines for PTSD (ISTSS, 2019; WHO, 2013), the U.S. Department of Veterans Affairs, Department of Defense (2017) clinical guidelines recommend trauma-focused psychological therapies, including EMDR therapy, as a first-line treatment for PTSD. However, the U.K. PTSD guidelines (NICE, 2018) recommend that EMDR therapy should not be offered to treat combat-related PTSD due to insufficient evidence for this population. A review undertaken according to Cochrane Collaboration Guidelines (Kitchiner et al., 2019) echoed this conclusion, but also stated that this is counterintuitive given the proliferation of EMDR therapy used around the world, and the non-RCT evidence showing that EMDR is successful in treating PTSD related to active duty (Frappell-Cooke & McCauley, 2019) and ex-serving military personnel (Kitchiner et al., 2012). This raises the question as to whether scarcity of RCT research should rule out EMDR therapy as a first-line treatment for combat-related PTSD, especially for those who do not respond to other trauma-focused therapies such as cognitive processing therapy and prolonged exposure (Kitchiner et al., 2019; Steenkamp et al., 2015). The ability of EMDR therapy to address PTSD and comorbid depression, anger, shame, guilt, grief, and pain illustrated with several case studies, as well as anecdotal evidence demonstrating positive effects with moral injury (Russell & Figley, 2013), highlights the potential benefit of EMDR for this population.

Research Priorities

For consideration in military guidelines and in general guidelines addressing military populations, rigorous

RCTs with large samples (including females) of active duty personnel and veterans in both in- and outpatient clinics is needed, comparing EMDR therapy to a recognized trauma-focused treatment and to a waitlist. Adequate treatment doses must be provided. Another research priority is to compare intensive treatment delivery and weekly sessions, and to determine if intensive treatment results in quicker recovery and less time away from duties (Hurley, 2018). Future RCTs should also compare treated and nontreated active duty personnel to examine the effectiveness of EMDR early intervention (Wesson & Gould, 2009) in preventing PTSD diagnosis and treating PTSD symptoms.

Unipolar Depression

With 23 published studies, there is growing evidence of EMDR therapy's effectiveness as a treatment for unipolar depression. There are 12 small or average-sized RCTs so that Sacket Level II criteria applies (see Appendix D). Eight of the studies examined EMDR therapy as a standalone treatment, and in four studies, EMDR was an add-on treatment. As a standalone treatment, EMDR was compared to CBT, trauma-focused CBT, treatment as usual (TAU; weight management and blood pressure control or no intervention), and a waitlist. In two studies, EMDR therapy was added-on to either TAU (psychodynamic therapy) or an antidepressant. In the only three-arm study, EMDR therapy was compared to assertiveness training and TAU while all groups received group CBT. Similarly, in a study comparing EMDR therapy to CBT, all participants were on an antidepressants. Aside from the 12 RCTs, an additional five nonrandomized cohort studies and six case series or single-case designs have been published. Together these studies support the effectiveness of EMDR therapy as a standalone treatment and as an add-on treatment to CBT, TAU, and antidepressants. As a standalone treatment, EMDR was more effective than trauma-focused CBT, TAU, and waitlist, with good remission rates and effects were maintained at follow-up. The comparisons with CBT were inconsistent, with one study reporting similar levels of effectiveness and another study finding EMDR therapy to be more effective than CBT. As an add-on treatment, EMDR therapy was found to be more effective than assertiveness training, TAU, and antidepressants, and equally effective as CBT. Furthermore, as an add-on treatment, EMDR hastened response to treatment, improved safety and compliance to antidepressant treatment, and enhanced TAU. In the only three-arm study, EMDR plus CBT was found to be more effective than assertiveness training plus CBT and TAU plus CBT. These results were maintained at follow-up.

Treatment Guidelines

Both NICE (2020) and the APA (2019) guidelines for treating depression did not evaluate EMDR therapy and it is not mentioned in their guidelines and not listed as a recommended treatment. Despite the promising results from existing studies, the lack of robust and large RCTs makes it difficult to draw firm conclusions about the effectiveness of EMDR as a treatment for unipolar depression.

Research Priorities

Methodological shortcomings such as the small sample sizes, short follow-ups, insufficient description of randomization, and the lack of an active control condition or TAU comparison, blind and independent assessors, and diagnostic interviews pre- and posttreatment need to be addressed in future studies. Further research also needs to include children and adolescents, and examine EMDR as a treatment for postpartum, psychotic, persistent, and seasonal depression.

Chronic and Acute Pain

To date, 23 studies have investigated the effectiveness of EMDR therapy in different conditions of chronic and acute pain (see Appendix E). In addition to eight RCTs with sample sizes from 28 to 75, 15 uncontrolled studies and case series have been conducted. Given that these studies mostly have small participant numbers, a Sackett Level II rating is appropriate. The studies on chronic pain include chronic back pain, pain due to rheumatoid arthritis, phantom limb pain, and pain due to fibromyalgia or diffuse chronic pain, and acute pain studies included migraine headaches and acute pain after abdominal surgery. (For a more detailed review see Tesarz et al., 2019). The studies show that EMDR therapy led to greater reductions in pain severity compared to waitlist, a neutral interview, TAU, standard medication, guided imagery, or eclectic therapy. When measured, the application of EMDR therapy was found to be associated with a decrease of comorbid symptoms such as anxiety and depressive symptoms, improved pain-related cognitions, and quality of life.

Treatment Guidelines

While the above RCTs provide preliminary evidence of EMDR effectiveness regarding chronic pain, EMDR therapy is not included in any current guideline for the treatment of any pain condition at the moment.

Research Priorities

It is clear that studies with strong methodological rigor are needed. Such studies should ideally have large sample sizes and include preferably a waitlist and an active control group such as CBT, TAU, or imagery techniques and involve the use of multiple therapists. Also, to have a more accurate measure of pain intensity, inventories that assess pain at different times of the day via pain diaries should be included. Multimodal assessments and functional assessments conducted by independent assessors are also recommended. In addition, there is an increasing demand for a better understanding of individual differences among patients suffering from chronic pain (Fillingim, 2017), and more personalized treatment approaches in pain therapy. Therefore, studies need to be carried out in which the role of predictors and mediators are studied, for example, PTSD or comorbid symptom severity, medication at start of therapy, and targets selected (e.g., PTSD vs. pain-related memories). Regarding experimental studies, research that will lead to a better understanding of the mechanisms resulting in the reduction of pain experience using EMDR is important. To be able to interpret the results of the effect of EMDR reliably, more detailed descriptions of the targeted memories, the order in which they are targeted, type of protocols used, and the way of treatment fidelity of EMDR therapy is measured are relevant topics to report in articles.

Cost-Effectiveness Studies on EMDR

The previous sections have focused on the outcome research relating to EMDR therapy. It is important to not only understand how an intervention performs in more pure conditions (explanatory or efficacy studies), but also how it works when delivered under real world circumstances (pragmatic or effectiveness studies). Policy makers, health insurers, and care providers are increasingly focusing on both the effectiveness of a particular intervention and the costs and benefits of each intervention when making a choice between possible alternatives (Dal-Ré et al., 2018). Studies on cost-effectiveness make use of different perspectives when it comes to calculating health economic costs and savings. One perspective is that of the payer, in which the costs and consequences for a specific party, such as the patient, employer, or insurer, are assessed. Another perspective for carrying out cost-effectiveness studies is the healthcare perspective, which covers the costs and consequences within a healthcare system. And finally, there is the social perspective, which takes into account all the costs and benefits that arise from the intervention, regardless of who experiences it. The last perspective in particular, measuring all relevant costs and benefits of interventions, is an important challenge. In general, and specifically with regard to EMDR therapy, sadly little research has been conducted into the costs and benefits of interventions.

Two studies (one RCT) have investigated the health economic benefits of treatment with EMDR therapy. In one of these, the health economic analysis that addressed all three perspectives as described above assessed the question as to whether PTSD treatment in patients with a psychotic disorder would be economically affordable and perhaps even cost saving. The authors computed these outcomes in comparison with health economic benefits of trauma-focused CBT. The results, from a sample of 155 outpatients, showed that adding EMDR treatment to standard care for individuals with PTSD and comorbid psychosis yielded higher savings than adding trauma-focused CBT (€1574 and €422 per patient per 6 months, respectively; De Bont et al., 2019). Future research into the cost-effectiveness of EMDR should be guided by expert guidelines in this area such as CHEERS (Husereau et al., 2013) or the ISPOR Good Research Practices Task Force Report (Ramsey et al., 2015). In another study, cost and benefits of treating participants with PTSD services provided in the British Mental Health Service were analyzed using a hybrid decision-analytic model consisting of a decision tree followed by a three-state Markov model (Mavranezouli et al., 2020). The authors concluded that EMDR was the most cost-effective intervention for adults with PTSD out of the 11 types of interventions assessed. In contrast they concluded that trauma-focused CBT appeared to be less cost-effective than other interventions (combined somatic/cognitive therapies, psychoeducation, self-help with support and SSRIs) and that supportive counseling was less cost-effective than no treatment (due to its relatively low clinical effectiveness and the associated service delivery cost). This major effectiveness study needs further replication in other health services to assess generalizability.

Summary and Recommendations

In this article we identified the gaps in the current body of EMDR research to establish the present state of affairs and to make recommendations regarding future EMDR therapy research. This review has examined the evidence for five areas where EMDR has shown promise beyond the treatment of adult PTSD. Based upon Sacketts' levels of evidence it appears that for two of the target areas, the strength of the research evidence is strong enough to be rated at Level I, whereas the other target areas meet Level II criteria (see Table 2).

In the first target area meeting Sackett's Level I criterion, PTSD in children and adolescents, research shows that EMDR therapy is associated with a significant reduction of PTSD symptoms or a loss of PTSD diagnosis compared to a waitlist, another control group, or standard care, and equally effective as trauma-focused CBT. Preliminary evidence indicates EMDR therapy achieved significant results in fewer sessions than trauma-focused CBT. Concerning the other target area that meets Sackett Level I criterion, EMDR early intervention research, the results suggest that EMDR therapy is effective in reducing PTSD symptoms and that it was more effective than either waiting list or TAU control conditions, supportive counseling, and critical incident stress debriefing.

Also in combat PTSD studies, an area where Sackett Level II is met, EMDR therapy showed to be equally effective as no-eye-movement EMDR and trauma-focused CBT (e.g., prolonged exposure), although "REM desensitization" proved more effective in one study.

In the area of unipolar depression, which also meets Sackett Level II criterion, EMDR therapy was found to be effective in reducing depressive symptoms as a standalone treatment and as an add-on to CBT, TAU, or the use of antidepressants. As a standalone treatment, EMDR therapy was found to be more effective than trauma-focused CBT, TAU, or waitlist-control conditions. When compared to CBT, comparisons were inconsistent, reporting equal effectiveness of both therapies in one study and superior effects of EMDR in another study. As an add-on treatment, EMDR therapy was found to be more effective than assertiveness training, TAU and, antidepressants, and equally effective as CBT. The chronic pain area also meets Sackett Level II criterion and studies show that EMDR therapy led to greater reductions in pain severity compared to waitlist, TAU, standard medication, guided imagery, or eclectic therapy.

TABLE 2. Levels of Evidence Based on Sackett (1989) for the Different Target Areas

Level	Target Area
I	PTSD in children and adolescents
I	EMDR as an early intervention
II	Combat-related PTSD
II	Unipolar depression
II	Chronic pain

Concerning cost-effectiveness, some studies have shown that EMDR therapy required fewer sessions or time than other active treatments to which EMDR therapy was compared (e.g., De Roos et al., 2017), thereby suggesting that it is a cost-effective intervention, but a recent review strongly supported this notion by showing that out of 11 types of interventions, EMDR therapy was found being the most cost-effective intervention for adults with PTSD (Mavranezouli et al., 2020).

Although results are encouraging with respect to the number of published studies conducted and their outcomes, the quality of the studies has generally been assessed as poor by independent reviewers, resulting in limited confidence in the reported effects. Methodological quality remains one of the greatest challenges. To this end, a limitation of the current position article is that the quality of the individual studies was not assessed. It would certainly have contributed to the further exploration of the status of EMDR in the selected focus areas to have taken into account risks of bias in each of the studies, and to have conducted meta-analyses for each target area separately. However, this was not the scope of the current article, which has the scope of mapping the current amount of research available in the target areas.

Based upon the current analysis of the topic areas discussed above, and the knowledge of the criteria used by the different guideline committees, some general recommendations on methodology can be made. Future studies on EMDR therapy need to:

- Include blinded diagnostic assessment, independent fidelity checks, and long-term follow-ups (at least 6 months or 1 year).
- Be registered in an international trial registry before participants are first included.
- Include a minimum number of participants ($N = 10$) in each arm of a trial at every time point. This means each arm needs to have a minimum of 13 at the start of treatment to allow for attrition.

- Compare not only with active treatments, but also waitlist conditions (68% of the ISTSS trauma-focused CBT studies are waitlist control studies compared to 39% of the EMDR studies).
- When possible, use recognized interventions with established efficacy as active treatment controls and treatment fidelity should be monitored.
- Pay attention to participant diagnosis. To be included in disorder specific guidelines it is best that at least 80% of the participants are diagnosed with the condition.
- Focus on an intent-to-treat sample rather than the sample of participants who completed treatment.
- Include cost-effectiveness data where possible.

In conclusion, clearly the EMDR community not only faces challenges with regard to conducting more research. Conducting high-quality research remains of the utmost importance. For the future of EMDR therapy, it is important to prioritize research on the topic areas discussed. In order to ensure adequate sample sizes and that results can be generalized beyond treatment effects found at particular sites, funding support should be given to multisite studies. Taking on board the above recommendations increases the likelihood that EMDR will be evaluated or considered for inclusion in international guidelines with regard to these topic areas, and when included, that EMDR therapy is available as a treatment in earlier stages following trauma for children and adolescents, for combat-related PTSD, and for patients with unipolar depression and with chronic pain.

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APPENDIX A. Overview of Research on EMDR Therapy (Individual and Group) in Children and Adolescents With PTSD or Clinically Important PTSD Symptoms

Author(s)	*N*	Sample	Intervention and Number of Sessions	Memories/ Phenomena Targeted	Outcomes/ Dependent Variables	Measure(s)	Significant Results
EMDR individual therapy RCTs							
Ahmad and Sundelin-Wahlsten (2008)	33	Children 6–16 years who grew up in psychosocially exposed condition	EMDR eight sessions (n = 17) versus WL (n = 16)	Disturbing memories of a traumatic event	PTSD symptoms, treatment session measures (severity of negative emotions)	DICA, PTSS-C	EMDR > WL: reduced PTSD symptoms.
Chemtob et al. (2002)	32	Children 6–12 years who experienced a hurricane	EMDR three sessions (n = 17) versus WL (n = 15)	Disturbing memories of the hurricane	PTSD symptoms, anxiety, depression, number of visits to school nurse	CRI, RCMAS, CDI	EMDR: pre- to 6-month FU reduced anxiety, depressive, PTSD symptoms, and healthcare visits. EMDR > WL on all.
De Roos et al. (2011)	52	Children 4–18 years who experienced a fireworks factory explosion	EMDR (n = 26) versus CBT (n = 26), both max four sessions	Disturbing memories of the fireworks factory explosion	PTSD, anxiety, depression, emotional/behavioral symptoms	UCLA PTSD-RI, CROPS, PROPS, BDS, MASC, CBCL	EMDR = CBT: reduced PTSD, anxiety, depression, emotional/behavioral symptoms at post and 3-month FU. EMDR fewer sessions (3.2 vs. 4).
De Roos et al. (2017)	103	Children 8–18 years who experienced a single traumatic event	Max six sessions EMDR (n = 43) versuscognitive behavioral writing therapy (n = 42) versus WL (n = 18)	Disturbing memories of single event trauma (e.g., physical or sexual abuse, accident/injury, traumatic loss)	PTSD diagnosis and symptoms, anxiety, depression, emotional/behavioral symptoms, somatic symptoms, negative trauma-related beliefs, quality of life	ADIS-C/P, CRTI-C/P, RCADS-C/P, SDQ-Y/P, CSI-C-P, CPTCI, Kidscreen27 C/P	CBWT = EMDR > WL: at post, 3- and 12-month FU: reduced PTSD, anxiety, depression, emotional/behavioral symptoms, negative trauma-related beliefs, quality of life. EMDR fewer sessions (4.1 vs. 5.4).
Diehle et al. (2015)	48	Children 8–18 years who experienced single or multiple traumatic events	EMDR (n = 25) versus TF-CBT (n = 23), both 8 sessions	Disturbing memories of single or multiple traumatic event	PTSD diagnosis and symptoms, anxiety, depression, behavioral problems	CAPS-CA, ADIS-P, CRIES-C, RCADS-C/P, SDQ-P	EMDR = TF-CBT: reduced PTSD symptoms. TF-CBT: reduced depression, hyperactivity. Number of sessions: EMDR = TF-CBT.

(*continued*)

APPENDIX A. Overview of Research on EMDR Therapy (Individual and Group) in Children and Adolescents With PTSD or Clinically Important PTSD Symptoms (*Continued*)

Author(s)	*N*	Sample	Intervention and Number of Sessions	Memories/ Phenomena Targeted	Outcomes/ Dependent Variables	Measure(s)	Significant Results
Jaberghaderi et al. (2004)	14	Girls 12–13 years who experienced sexual abuse	EMDR ($n = 7$) versus CBT ($n = 7$), both max. 12 sessions	Disturbing memories of sexual abuse	PTSD symptoms, problematic behavior in school	CROPS, PROPS, Rutter Teacher Scale	EMDR = CBT: reduced PTSD symptoms and behavioral problems. EMDR fewer sessions (6.1 vs. 11.6).
Jaberghaderi et al. (2019)	139	Children aged 8–12 years who experienced domestic violence	CBT, 6–12 sessions ($n = 40$) versus EMDR, 3–12 sessions ($n = 40$) versus control ($n = 59$)	Disturbing memories of physical abuse and witnessing domestic violence	PTSD symptoms, problematic behavior exhibited in school	LITES, CROPS, PROPS, RTS	EMDR = CBT > Control: reduction in PTSD symptoms. No classroom behavior change. EMDR fewer sessions (5 vs. 9).
Jiménez et al. (2020)	32	Children aged 12–17 years old who experienced sexual and/or physical violence	EMDR-PRECI, 2–9 sessions ($n = 16$) versus TAU, mean 12.6 sessions ($n = 16$)	Disturbing memories related to sexual and/or physical violence	PTSD diagnosis and symptoms, anxiety, depression	CAPS-5-CA, PCL-5, HADS	EMDR > TAU: Reduction in PTSD diagnosis and symptoms at 1- and 3-month FU. EMDR > TAU: Anxiety and depressive symptoms at 3-month FU (no 1-month measure).
Kemp et al. (2010)	27	Children 6–12 years who experienced a motor vehicle accident	EMDR, four sessions ($n = 13$) versus WL ($n = 14$)	Disturbing memories of the motor vehicle accident	PTSD symptoms, anxiety, depression, behavioral problems	CPTS-RI, PTS-RI/P, STAI, CDSCBCL	EMDR > WL: reduction in PTSD symptoms and diagnostic criteria, depression, anxiety, behavior. Gains maintained at 3- and 12-month FU.
Meentken et al. (2020)	74	Children 4–15 years who experienced medical trauma	EMDR, mean 3.5 sessions ($n = 37$) versus CAU ($n = 37$)	Disturbing memories of medically related trauma/s	Subthreshold PTSD symptoms (CAPS-CA/DIPA), anxiety, quality of sleep	CRTI, SCARED-NL, CDI-2, SSR/C-SHQ	EMDR > CAU: reduction in blood injection-injury phobia symptoms, depression, sleep problems: EMDR = CAU: subthreshold PTSD symptoms.

(*continued*)

APPENDIX A. Overview of Research on EMDR Therapy (Individual and Group) in Children and Adolescents With PTSD or Clinically Important PTSD Symptoms (*Continued*)

Author(s)	*N*	Sample	Intervention and Number of Sessions	Memories/ Phenomena Targeted	Outcomes/ Dependent Variables	Measure(s)	Significant Results
Soberman et al. (2002)	29	Boys 10–16 years with conduct problems in residential or day treatment	TAU ($n = 15$) versus TAU + EMDR, three sessions ($n = 14$)		PTSD symptoms, behavioral problems	IES-8, CROPS, PROPS, PRS, BRS	TAU + EMDR > TAU: reduced parent reported PTSD symptoms at post. TAU + EMDR > TAU: problem behavior at 2-month FU.
EMDR group therapy RCTs							
Molero et al. (2019)	184	Refugee minors 13–17 years exposed to war	Intensive EMDR IGTP-OTS nine sessions during three consecutive days ($n = 93$) versus no treatment ($n = 91$)	Disturbing memories of life as refugee	PTSD symptoms, depression, anxiety	PCL-5, HADS	EMDR IGTP-OTS > no treatment: reduced PTSD symptoms at post, 3-month FU. Reduced depression and anxiety at 3-month FU.
Osorio et al. (2018)	23	Adolescents and young adults 13–22 years with different types of cancer	Intensive EMDR IGTP-OTS six sessions during two consecutive days ($n = 11$) versus no treatment ($n = 12$)	Disturbing memories of cancer diagnosis, treatment	PTSD symptoms, depression, anxiety	PCL-5, HADS	EMDR IGTP-OTS > no treatment; reduced PTSD symptoms, depression, anxiety at post, 3-month FU.
EMDR individual therapy, nonrandomized controlled studies and case series or studies not controlled							
Hensel (2009)	32	Children 1.9–18 years. Extended case series design	EMDR (mean 1.5 sessions)	Disturbing memories of single traumas	PTSD	PROPS	Reduced PTSD symptoms at post, 6-month FU.
Karadag et al. (2019)	30	Children 6–18 years who experienced single or multiple traumatic events. Extended case series design	EMDR (up to six sessions, mean 4.15)	Disturbing memories of traumatic event(s)	PTSD symptoms, anxiety	K-SADS-PL, CPTS-RI, STAI (C)	Reduced PTSD and anxiety symptoms 6 weeks posttreatment.

(*continued*)

APPENDIX A. Overview of Research on EMDR Therapy (Individual and Group) in Children and Adolescents With PTSD or Clinically Important PTSD Symptoms (*Continued*)

Author(s)	*N*	Sample	Intervention and Number of Sessions	Memories/ Phenomena Targeted	Outcomes/ Dependent Variables	Measure(s)	Significant Results
Puffer et al. (2000)	20	Children 8–17 years, nonrandomized delayed treatment comparison design	EMDR one session ($n = 10$) versus delayed treatment ($n = 10$)	Disturbing memories of single traumas	PTSD symptoms, anxiety	CRIES-8, RMAS	Reduced PTSD symptoms for EMDR only.
Ribchester et al. (2010)	11	Children 8–16 years with PTSD from a road traffic accident. Extended case series design	EMDR (one to four sessions, mean 2.4)	Disturbing memories of road traffic accident	PTSD symptoms, anxiety, depression, attentional deficits	ADIS, CRIES-8, RCMAS, BDRS, CASQ-R, CAWS	Reduced PTSD, anxiety, depression, and attentional bias at post and FU. All patients lost PTSD diagnosis.
Tang et al. (2015)	83	Children 12–15 years who experienced a typhoon. Nonrandomized control group	EMDR, four sessions ($n = 41$) versus TAU ($n = 42$)	Disturbing memories of typhoon	PTSD disaster related symptoms, general anxiety, depression	C-IES-R, MASC, CES-D	EMDR > TAU: reduced PTSD symptoms, anxiety, depression.
Wadaa et al. (2010)	37	Children 7–12 years exposed to war-related trauma. Nonrandomized control group	EMDR, 12 sessions ($n = 12$) versus no treatment (NT) ($n = 25$)	Disturbing memories of war and violence	PTSD symptoms	UCLA-PTSD-index	EMDR > NT: PTSD symptoms.

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APPENDIX A. Overview of Research on EMDR Therapy (Individual and Group) in Children and Adolescents With PTSD or Clinically Important PTSD Symptoms (*Continued*)

Author(s)	*N*	Sample	Intervention and Number of Sessions	Memories/ Phenomena Targeted	Outcomes/ Dependent Variables	Measure(s)	Significant Results
EMDR group therapy case series or studies not controlled							
Hurn and Barron (2018)	8	Child refugees 6–11 years exposed to war. Qualitative study design.	EMDR-IGTP in second session of four-session psychosocial program	Disturbing memories of war and bereavement	Emotional distress, therapist view on IGTP's effectiveness and appropriateness, Arab interpreter perspectives on cultural appropriateness	SUD, therapists program report, interpreters focus group	Qualitative analysis was performed. Reported positive outcomes.
Jarero et al. (2006)	44	Children 8–15 years, who experienced flood	EMDR-IGTP (one session, 50–60 minutes)	Disturbing memories of the flood	PTSD symptoms	CRTES	No statistical analysis performed. Reported positive outcomes.
Jarero et al. (2013b)	34	Children 8–17 years who experienced severe interpersonal trauma	Daily EMDR-IGTP over 3 days ($n = 34$), plus individual EMDR (1–2 sessions) ($n = 26$ of 34) during weeklong psychological recovery camp	Disturbing memories of interpersonal trauma	PTSD symptoms	CRTES, SPRINT	IGTP + recovery camp: Reduced PTSD symptoms at post and 3-month FU.
Lempertz et al. (2020)	10	Refugee children 4–6 years who experienced war	EMDR-based group therapy (5 sessions, 50–60 minutes) over 5 consecutive days	Disturbing memories of war	PTSD symptoms	DLTC, CBCL 1.5–5, parent and teacher report	Teacher-reported PTSD symptoms decreased at post, 3-month FU.

(*continued*)

APPENDIX A. Overview of Research on EMDR Therapy (Individual and Group) in Children and Adolescents With PTSD or Clinically Important PTSD Symptoms (*Continued*)

Author(s)	*N*	Sample	Intervention and Number of Sessions	Memories/ Phenomena Targeted	Outcomes/ Dependent Variables	Measure(s)	Significant Results
Perilli et al. (2019)	14, 8 analyzed	Child refugees 3–18 years exposed to war	EMDR-IGTP, three sessions	Disturbing memories of war	PTSD symptoms, depression, anxiety	CRIES, DSRS, SCARED	Reduced PTSD symptoms.
Smyth-Dent et al. (2019)	48	Refugee adolescents 12–17 years exposed to war	Intensive EMDR IGTP-OTS (six sessions in 5 hours over two consecutive days)	Disturbing memories of life as refugees	PTSD symptoms, depression, anxiety	PCL-5, HADS	Reduced PTSD symptoms, depression, anxiety.

Note. ADIS = Anxiety Disorders Interview Schedule; BDRS = Birleson Depression Rating Scale; BRS = Behavioral Reward Scale; C/P/A = Child version/Parent version/Adolescent version; CAPS-CA = Clinician-Administered PTSD Scale for Children and Adolescents; CASQ-R = Children's Attributional Style Questionnaire Revised; CAU = Care as usual; CAWS = Children's Assumptive World Scale; CBCL = Child Behavior Checklist; CBWT = cognitive behavioral writing therapy; CDI = Children's Depression Inventory; CDS = Children's Depression Scale; CES-D = Center for Epidemiological Studies Depression Scale; C-IES-R = Chinese Impact of Events Scale-Revised; C-PTCI = Child Post-Traumatic Cognitions Inventory; CPTS-RI = Child Post-Traumatic Stress Reaction Index; CRI = Child Reaction Index; CRIES- 8 = Children's Revised Impact of Events Scale; CRTES = Child's Reaction to Traumatic Events Scale; CRTI = Revised Childs Response to Trauma Inventory; CRI = Children's Reaction Index; CRIES = Children Revised Impact of Event Scale; CROPS = Child Report of Post-traumatic Stress Symptoms; CSI = Child Somatization Inventory; CSHQ = Child Sleep Habits Questionnaire; DICA = Diagnostic Interview for Children and Adolescents; DIPA = Diagnostic Infant and Preschool Assessment; DLTC = Daily Life Test for Children; DSRS = Depression Self-Rating Scale; FU = Follow-up; HADS = The Hospital Anxiety and Depression Scale; IGTP = Integrative Group Treatment Protocol; IGTP-OTS = Integrative Group Treatment Protocol for Ongoing Traumatic Stress; K-SADS-PL = Schedule for Affective Disorders and Schizophrenia for school-age Children at Present and Throughout Life; LITES = Life Incidence of Traumatic Events Scale; MASC = Multidimensional Anxiety Scale for Children; PCL-5 = Posttraumatic Stress Disorder Checklist for *DSM-5*; PROPS = Parent Report of Post-traumatic Stress Symptoms; PTSD = posttraumatic stress disorder; PTSS-C = Post-Traumatic Stress Symptom Scale for Children; PRS = Problem Rating Scale; PTS-RI = Post-Traumatic Stress Reaction Index; RCADS = Revised Children's Anxiety and Depression Scale; SCARED-NL = Dutch Screen for Child Anxiety Related Emotional Disorders; RCMAS = Revised Children's Manifest Anxiety Scale; RTS = Rutter Tacher Scale; SCARED = Screen for Child Anxiety Related Disorders; SDQ = Strengths and Difficulties Questionnaire; SPRINT = Short PTSD Rating Interview; SSR = Sleep Self Report; STAIC = State-Trait Anxiety Inventory for Children; SUDS = Subjective Units of Disturbance; TF-CBT = trauma-focused cognitive behavioral therapy; UCLA PTSD-RI = University of California Los Angeles PTSD Reaction Index; VOC = Validity of Cognition; WL = waitlist.

APPENDIX B. Overview of Research on EMDR Early Intervention Studies Within 3 Months of Traumatic Event

Author(s)	*N*	Sample and Time Since Event	Intervention and Number of Sessions	Memories Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
RCTs							
Chiorino et al. (2020)	37	Women with postpartum trauma, within 1–3 days	Recent Birth Trauma Protocol (EMDR) (n = 19) versus TAU (n = 18). One session, 90 minutes	Disturbances relating to traumatic childbirth	Symptoms postpartum PTSD and depression, mother-to-infant bonding	IES-R, MIBS, PDEQ, EPDS	EMDR > TAU: reduced PTSD symptoms at 6 weeks post.
Gil-Jardiné et al. (2018)	130	Emergency room (accident injury or acute medical crisis), at risk for PCLS, within 24 hours	R-TEP (EMDR) one session 60 minutes (n = 42) versus reassurance one session 15 minutes (n = 47) versus TAU (n = 41) one session	Disturbances related to recent trauma	PCLS symptoms, PTSD diagnosis, PTSD symptoms	PCSLS, PCL-5	At 3 months, R-TEP > TAU for lower incidence of PCSLS: 18% (R-TEP), 37% (reassurance), and 65% (TAU).
Jarero et al. (2011)	18	Earthquake survivors 14 days	PRECI (EMDR) immediate (n = 9) versus 4 day waitlist/delayed tx (n = 9). One session, 80–130 minutes	Worst memory of the earthquake	PTSD symptoms	IES	PRECI > WL: reduced PTSD symptoms at post. PRECI = DT: reduced PTSD symptoms at 12-week FU.
Jarero et al. (2013a)	39	First responders within 3 months	EMDR PROPARA (n = 19) versus supportive counseling (n = 20). Two sessions, 90 minutes	Worst memory of recent trauma	PTSD symptoms	SPRINT	PROPARA > supportive counseling: reduced PTSD symptoms at post and 3-month FU.
Jarero et al. (2015)	25	Explosion in workplace 25 days	PRECI (EMDR) (13) versus 1 week waitlist/delayed tx (12). Two sessions, 60 minutes	Worst memory of the explosion	PTSD symptoms	SPRINT	PRECI > WL: reduced PTSD symptoms PTSD at 1 week post. PRECI = DT: reduced PTSD symptoms at 90-day FU.

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APPENDIX B. Overview of Research on EMDR Early Intervention Studies Within 3 Months of Traumatic Event (*Continued*)

Author(s)	*N*	Sample and Time Since Event	Intervention and Number of Sessions	Memories Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Shapiro et al. (2018)	25	Rocket attacks within 3 months	R-TEP (EMDR) (n = 13) versus delayed tx (n = 12). Three sessions, 90 minutes	Disturbances related to recent trauma	PTSD and depression symptoms and resilience	PCL-5, PHQ-9, BRCS	R-TEP > WL: reduced PTSD, depression symptoms at 1-month post.
Shapiro and Laub (2015)	16	Rocket attack within 3 months	R-TEP (EMDR) immediate (n = 9) versus 1 week waitlist/delayed tx (n = 7). Two sessions, 90 minutes	Disturbances related to recent trauma	PTSD and symptoms of depression	IES-R, PHQ-9	R-TEP > WL: decreased PTSD, depression symptoms at 1 week. R-TEP = DT: decreased PTSD, depression at 3-month FU.
Tarquinio et al. (2016)	60	Workplace violence 48 hours	EMDR-RE (n = 19) versus CISD (n = 23) versus 48 hour delayed tx (n = 18). One session 90–120 minutes	Disturbances related to recent trauma	PTSD symptoms	PCLS	Reduced PTSD symptoms for EMDR-RE and delayed EMDR-RE, but not CISD. EMDR-RE = delayed EMDR-RE > CISD at 3-month FU.
Cohort and case controlled studies							
Brennstuhl et al. (2013)	34	Workplace violence or accident within 48 hours	URG (EMDR) (n = 19) versus eclectic (n = 15), nonrandom matched controls. One session 60–90 minutes	Disturbances related to recent trauma	PTSD symptoms	PCL-S	Reduced PTSD symptoms for URG and eclectic. URG > eclectic therapy.

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APPENDIX B. Overview of Research on EMDR Early Intervention Studies Within 3 Months of Traumatic Event (*Continued*)

Author(s)	*N*	Sample and Time Since Event	Intervention and Number of Sessions	Memories Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Jarero and Uribe (2011, 2012)	32	Workers at human massacre site, under threat ongoing trauma	PRECI (EMDR) immediate for those with severe symptoms ($n = 18$) versus 17-day waitlist/delayed tx for moderate symptoms ($n = 14$). One session 90–120 minutes	Worst memory related to ongoing forensic work	PTSD symptoms	IES, SPRINT	Immediate PRECI > WL: PTSD symptom reduction at 17 days. Reduced PTSD symptoms for immediate treatment and delayed treatment at post, 3- and 5-month FU.
Historical cohort or case-control studies							
Saltini et al. (2018)	529	Earthquake survivors within first month (early) and within second, third months (late) of earthquake	R-TEP (EMDR): Early ($n = 239$), late ($n = 290$), two to four sessions, control group analogue	Disturbances related to earthquake	PTSD symptoms	IES-R	Early = Late: reduction in PTSD symptoms.
Silver et al. (2005)	24	Post 9/11, within 3 months (early treatment, ET ($n = 12$), after 11 weeks (delayed treatment, DT, $n = 12$)	EMDR-RE, 4–5 sessions, analogue control	Disturbances relating to 9/11 trauma	Subjective distress	SUD, VOC	ET = DT for SUD, VOC.
Case series or studies not controlled							
Adúriz et al. (2009)	124	Child survivors, of flood within 3 months	EMDR-IGTP, one session 2 hours	Worst memory of the flood	PTSD symptoms	CRTES	Reduction of PTSD symptoms at post and 3-month FU.

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APPENDIX B. Overview of Research on EMDR Early Intervention Studies Within 3 Months of Traumatic Event (*Continued*)

Author(s)	*N*	Sample and Time Since Event	Intervention and Number of Sessions	Memories Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Brennstuhl et al. (2019)	36	Children (mean age 12–13 years) who experienced terrorist attack, within 48 hours	EMDR-IGTP, one session	Worst memory of the terrorist attack	PTSD symptoms	PCLS	Reduction of PTSD symptoms at post and 3-month FU.
Buydens et al. (2014)	7	Bank robbery ($n = 6$), suicide of colleague ($n = 1$)	EMDR-RE, 7–10 days, mean 5.2 sessions	Disturbances related to recent trauma	PTSD symptoms	IES-R	No statistical analysis of reduced PTSD symptoms.
Fernandez et al. (2003)	236	Children exposed to plane crash adjacent to the school, within 30 days	EMDR-IGTP, 1 session of 90 minutes	Worst memory of the plane crash	Distress symptoms	Teachers' observations	No statistical analysis. Reports positive outcome.
Jarero et al. (2006)	44	Child survivors of flood, within 2 months.	EMDR-IGTP, 1 session of 90 minutes	Worst memory of the flood	PTSD symptoms	CRTES	No statistical analysis of reduced PTSD symptoms.
Jarero et al. (2008)	16	Children whose fathers were killed in mine explosion, within 3 months	EMDR-IGTP, 1 session of 90 minutes	Worst memory of father's death	PTSD symptoms	CRTES	Reduction of PTSD symptoms at post and 3-month FU.
Jarero and Artigas (2010)	20	Adults stranded during violent geopolitical crisis. Provided during the crisis	EMDR-IGTP, 3 sessions of 90 minutes	Worst phenomena related to the danger	PTSD symptoms	IES	Reduction of PTSD symptoms at post and 14 weeks FU despite exposure to ongoing crisis.

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APPENDIX B. Overview of Research on EMDR Early Intervention Studies Within 3 Months of Traumatic Event (*Continued*)

Author(s)	*N*	Sample and Time Since Event	Intervention and Number of Sessions	Memories Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Maslovaric et al. (2017)	116	Youth (age 13–20 years) who survived earthquake, within 3 months	EMDR-IGTP, 3 sessions of 90 minutes	Worst memory of the earthquake	PTSD symptoms	IES-R	Reduction of PTSD symptoms at post and 3-month FU.
Tarquinio et al. (2012)	17	Women who had been raped, within 24–78 hours	URG (EMDR), single session	Memory of sexual assault	PTSD symptoms, anxiety, sexual behavior	IES, questions regarding sexual desire and excitation	Reduction of PTSD symptoms at post, 4 weeks, and 6 months, and increase in sexual desire and excitation at 4 weeks and 6-month FU.
Trentini et al. (2018)	332	Child earthquake survivors, within 3 months	EMDR-IGTP, 3 sessions of 60–90 minutes	Worst memory of earthquake	PTSD symptoms	CRIES, Emotion Thermometers	Reduction of PTSD and anxiety symptoms at post.
Zaghrout-Hodali et al. (2008)	7	Children during the ongoing war	EMDR-IGTP, 4 sessions	Worst memory of ongoing war	Distress symptoms	SUDS, behavioral observations	No statistical analysis of reduced SUD scores. Reports positive outcome.

Note. BDI = Beck Depression Inventory; BRCS = Brief Resilience Coping Scale; CISD = Critical Incident Stress Debriefing; CRTES = Child's Reaction to Traumatic Events Scale; DT = delayed treatment; EMDR = Eye Movement Desensitization and Reprocessing; ET = early treatment; EPDS = Edinburgh Postnatal Depression Scale; HADS = Hospital Anxiety and Depression Scale; IES = Impact of Event Scale; IES-R = Impact of Event Scale-Revised; MIBS = Mother-to-Infant Bonding Scale; PDEQ = Peritraumatic Dissociative Experiences Questionnaire; PRECI = EMDR protocol for recent critical incidents and ongoing traumatic stress; PCL-C = PTSD Checklist-Civilian Version; PDEG = Peritraumatic Dissociative Experience Questionnaire; PCL-S = Post traumatic Checklist Scale; PCLS = Post Concussion-Like Symptoms; PDEG = Peritraumatic Dissociative Experience Questionnaire; PROPARA = protocol for paraprofessional use in acute trauma situations; RE = EMDR Recent Event Protocol; R-TEP = Recent Traumatic Episode Protocol; SPRINT = Short PTSD Rating Interview; SUD = Subjective Units of Disturbance Scale; tx = treatment; URG = EMDR emergency protocol; VOC: Validity of Cognition.

APPENDIX C. Overview of Research Examining EMDR Therapy to Treat Combat-Related PTSD

Author(s)	*N*	Setting and Military Population	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
RCTs							
Ahmadi et al. (2015)	33	Iran military service men admitted to hospital, active duty	EMDR ($n = 11$), REM-Desensitization ($n = 10$), no treatment ($n = 12$)	Not described.	PTSD, depression, sleep, death anxiety	MSPTSD, PSQI, DAQ.	At post, EMDR = REM > control: reduction in PTSD symptoms. EMDR > REM reduction of depression. REM > EMDR on intrusive thoughts, total sleep quality.
Boudewyns and Hyer (1996)	61	In- and outpatient U.S. treatment unit	EMDR ($n = 21$), EMDR eyes closed ($n = 18$), group therapy ($n = 22$). EMDR: five to seven sessions, group tx: eight sessions	Most disturbing memory	PTSD symptoms	SCID, WSI, CAPS, IES, POMS, physiology: HR, SC, BP, EMG	At post, EMDR = EMDR eyes closed = group tx: reduction in PTSD symptoms on the CAPS. EMDR = EMDR eyes closed > group tx: reduction in anxiety. No FU data.
Carlson et al. (1998)	35	VA Medical center and community veteran centers ex-serving	EMDR ($n = 10$), biofeedback relaxation ($n = 13$), WL ($n = 12$), 12 weekly sessions	Most traumatic scene targeted first.	PTSD, depression, anxiety, physiology (HR, Temp, SCL)	CAPS-1, MISS, IES, PSS-SR, BDI, STAI, SSCQ.	At post, 3-month FU, EMDR > WL and biofeedback: reduction on PTSD measures (MISS, PSS-SR); EMDR = biofeedback = WL on IES. At 3-, 9-month FU EMDR > Biofeedback reduced CAPS scores.

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APPENDIX C. Overview of Research Examining EMDR Therapy to Treat Combat-Related PTSD (*Continued*)

Author(s)	*N*	Setting and Military Population	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Devilly et al. (1998)	51	VA counseling service or hospital outpatient clinic, ex-serving veterans (Vietnam)	EMDR (n = 19), EMDR without EM (n = 16), TAU (n = 16), two sessions for 5 weeks of 90 minutes max	Participants described a traumatic scenario	PTSD, depression, anxiety, physiological measures (HR, BP)	PTSD-I, MSPTSD-C, IES, STAI-Y2, BDI, PPD, COT	At post, EMDR = EMDR without EM = TAU: reductions on PTSD, depression, anxiety, personal problems. EMDR = EMDR without EM > TAU: reliable clinical change. At 6-month FU, improvement not maintained on any measure.
Jensen (1994)	25	VA medical center, ex-serving veterans (Vietnam)	EMDR (n = 13), WL/-TAU (n = 12) two sessions	Single picture of traumatic memory	PTSD	SI-PTSD, MSPTSD-C	No significant effects.
Lee et al. (2002)[a]	24	One-third participants recruited from government defense service.	EMDR (n = 12), SITPE (n = 12), 7 weekly sessions of 90 minutes	Most disturbing trauma memory	PTSD, depression	SI-PTSD, MMPI-K, IES, BDI	At post EMDR = SITPE: reduction in PTSD and depression. At 3-month FU: EMDR > STIPE.
Cohort and case controlled studies, and EMDR as Adjunctive Treatment							
Alliger-Horn et al. (2015)[b]	40	Inpatient war-traumatized German soldiers	TAU + EMDR, TAU + IRRT (n unable to extract)	Unable to extract	PTSD symptoms, comorbid symptoms.	Unable to extract	TAU + EMDR = TAU + IRRT: reduction in trauma complaints, comorbid symptoms.

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APPENDIX C. Overview of Research Examining EMDR Therapy to Treat Combat-Related PTSD

Author(s)	*N*	Setting and Military Population	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Köhler et al. (2017)	96	German soldier inpatient treatment facility	TAU + EMDR (n = 78) versus WL (n = 18) EMDR: 2–3 90–100 minutes sessions a week for 4 weeks	Distressing memories underlying symptoms	PTSD symptoms, depression, general mental health symptoms	PDS, BDI-II, SCL-90-R	At post, TAU + EMDR > WL: reduction of PTSD symptoms and depression. No FU data.
Rogers et al. (1999)	12	Inpatient treatment program, ex-serving veteran (Vietnam)	EMDR (n = 6) versus Exposure (n = 6) one session 60–90 minutes	Most distressing war experience	PTSD symptoms	CAPS, IES, SUD, Physiological: HR, BP.	EMDR = Exposure: reduction in PTSD symptoms. EMDR > exposure: reduction in within treatment SUD and self-reported intrusions. No FU data.
Silver et al. (1995)	83	Inpatient, veterans (Vietnam) from VA PTSD program	TAU + EMDR (n = 13) 1 session minimum, TAU + biofeedback (n = 6), TAU + relaxation (n = 9), both 3 sessions minimum. TAU (n = 55).	Not mentioned	Anxiety, anger, depression, isolation, intrusions, flashbacks, nightmares, relationships	PRF	At post, EMDR > biofeedback, relaxation, control: improvement on anxiety, isolation. EMDR > biofeedback: improvement on intrusive thoughts, flashbacks, nightmares.
Historical cohort or case-control studies							
Bandelow et al. (2012)	117	German military hospital (archived records)	CBT (n = 15), EMDR (n = 102). Sessions CBT and EMDR ranged 1–22, average 2.3	Memories associated with presenting PTSD	PTSD symptoms	PTSD-10, IES-R	Report about successful treatment, no statistical analyses.

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APPENDIX C. Overview of Research Examining EMDR Therapy to Treat Combat-Related PTSD (*Continued*)

Author(s)	*N*	Setting and Military Population	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Hurley (2018)	30	Community outpatient military treatment center. (Archived treatment data), ex-serving military	EMDR intensive (n = 15), 20 sessions/10 days. EMDR weekly (n = 15), 18–20 sessions	Memories associated with PTSD	PTSD symptoms	IES-R, PCL-M, PCL-5	1-year FU: EMDR intensive = EMDR weekly: reduction in PTSD symptoms on IES-R.
Macklin et al. (2000); Pitman et al. (1996)	17	Ex-serving veterans (Vietnam)	1996: Crossover design: 6 sessions EMDR-with-EM, 6 with EMDR-with-eyes fixed + tapping versus no treatment. 2000: Follow-up cohort comparison: EMDR treated (N = 13) versus historical cohort (N-14)	Each session focused on the worst aspect of two traumatic combat experiences	PTSD diagnosis and symptoms, specifically avoidance, intrusions	SCID, CAPS, SCL-90, IES, MSPTSD-C, physiology: HR, SC, EMT, EM	1996 post, EMDR conditions: reduction in PTSD symptoms. At 5-year FU, EMDR therapy = control: significant worsening of symptoms reported on the CAPS, MISS, SCL-90 pre- to FU. Only avoidance reduction maintained for EMDR. Of note, EMDR treatment fidelity scores were low.
Case series or studies not controlled							
Brickell et al. (2015)	99	U.S. military community outpatient counseling centers (archived treatment data),(military and nonmilitary sample)	EMDR. Average 7.2 sessions, duration not reported	Traumatic events (both combat and noncombat PTSD treated)	PTSD symptoms, anxiety, depression	BDI-II, BAI, PCL-M	At post, in active military cases, reduction in PTSD, anxiety, depression.

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APPENDIX C. Overview of Research Examining EMDR Therapy to Treat Combat-Related PTSD (*Continued*)

Author(s)	*N*	Setting and Military Population	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Carlson et al. (1996)	4	U.S. VA medical center, veterans (Vietnam)	EMDR 12 biweekly sessions, 60–75 minutes	Combat memories targeted	PTSD, anxiety, depression	MSPTSD-C, IES, CAPS, BDI, STAI, SSCQ, physiology	No statistical analysis. Reports positive outcome for 3 of 4 clients.
Lipke and Botkin (1992)	5	U.S. VA inpatient medical center. Ex-serving veterans (Vietnam)	EMDR, 1 session	The most troubling memory of Vietnam	PTSD	MSPTSD-C	No statistical analysis. Discusses EMDR procedural issues and symptom complexity.
McLay et al. (2016)	331	Military mental health clinics (archived treatment data), active duty	EMDR (n = 46), TAU; included CBT, exposure, CPT, and nontrauma-focused therapy (n = 285). Number of sessions: 7–10	–	PTSD symptoms, depression, sleep, functioning	PCL-M	EMDR > TAU: fewer therapy sessions over 10 weeks, and greater improvement in PTSD symptoms.
Russell (2006)	4	Iraq War casualties in field hospital, active duty	EMDR, 1 session	Memory of most disturbing event	PTSD—intrusive symptoms	SCI, IES	No statistical analysis. Reports positive outcome.
Russell (2008a)	1	Military outpatient clinic, active duty	EMDR, 4 sessions	Memories related to leg amputation	PTSD symptoms, phantom limb pain	IES, BDI, NRS	No statistical analysis. Reports positive outcome.

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APPENDIX C. Overview of Research Examining EMDR Therapy to Treat Combat-Related PTSD (*Continued*)

Author(s)	*N*	Setting and Military Population	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Russell (2008b)	1	Iraq war combat veteran	EMDR, 5 weekly sessions 60 minutes	Most distressing combat memories	Medically unexplained symptoms, PTSD symptoms	IES-R, BDI	No statistical analysis. Reports positive outcome.
Silver et al. (2008)	2	Inpatient VA medical center, veteran (Iraq, Vietnam), ex-serving	EMDR: Case 1: 4 sessions in 2 weeks. Case 2: 2 sessions	Recent and most distressing war-related memories	Anxiety, depression, anger, pain, myoclonic jerking	IES, BDI, BHS	No statistical analysis. Reports positive outcome.
Wesson and Gould (2009)	1	U.K. soldier on front line, active duty	EMDR, 4 sessions over 4 days (recent event protocol)	Memory of landmine event	Acute stress, PTSD symptoms, depression	PCL-C, IES-R, HADS, BDI	No statistical analysis. Reports positive outcome.
Wright and Russell (2013)	1	Army mental health outpatient clinic, active duty	EMDR, 7 weekly sessions	Memories related to violent impulses	PTSD symptoms, depression	PCL-M, BDI	No statistical analysis. Reports positive outcome.
Young (1995)	1	Veterans outreach clinic (Vietnam), ex-serving	EMDR, 1 session 60 minutes	Distressing memories of friend's death	Refractory PTSD	SUD, VoC	No statistical analysis. Reports positive outcome on SUD and VoC.

Note. FU = follow-up; > means significantly better than. Treatments. EMDR = eye movement desensitization and reprocessing; CBT-TTP = cognitive behavior therapy-trauma treatment protocol; IRRT = Imagery rescripting and reprocessing therapy; SITPE = Stress Inoculation Training with Prolonged Exposure; TAU = Treatment as usual. Measures. BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; BHS = Beck Hopelessness Scale; CAPS: = Clinically Administered PTSD Scale; CES = Combat Exposure Scale; COT = Credibility of Therapy Questionnaire; DAQ = Death anxiety questionnaire; FU = follow-up; GAS = Goal Attainment Scaling; HADS = Hospital Anxiety and Depression Scale; IES (-R) =: Impact of Events Scale (-Revised); MMPI = Minnesota Multiphasic Personality Inventory; MSPTSD-C = Mississippi Scale for Combat-Related PTSD; NRS = Numeric Rating Scale; PCL-C: = PTSD checklist—Civilian; PCL-M = PTSD checklist—Military; PDS = Posttraumatic Stress Diagnostic Scale; PPD = Personal Problem Definition Questionnaire; PRF = Problem Report Form; PSQI = Pittsburgh Sleep Quality Index; POM = Profile of Moods Scale; PTSD-I = PTSD Interview; PSS-SR = PTSD Symptom Scale-Self Report; PTSD-10 = Posttraumatic Stress Scale; SCI = Structured Clinical Interview-*DSM-IV*; SCID = Structured Clinical Interview for *DSM-III-R*; SI-PTSD = Davidson's Structured Interview for PTSD; STAI-Y2 = Spielberger State-Trait Anxiety Inventory; SSCQ = Stressful Scene Construction Questionnaire: SCL-90 = Symptom Check List; SUD = Subject Units of Distress Scale; VoC = Validity of Cognition Scale; WSI = War Stress Inventory. Physiological measures (HR = heart rate; BP = blood pressure; SC/SCL/SCR = skin conductance; Temp = skin temperature; EMT/EMG = electromyographic sensors).

[a]Only one-third participants were military. [b]Article published in German (abstract only in English).

APPENDIX D. Overview of Effects of EMDR Therapy on Unipolar Depression as Primary Target

Author(s)	*N*	Setting/Sample	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measures	Significant Results
RCTs							
Behnammoghadam et al. (2015)	60	Adult outpatients with depression (BDI > 17) up to 4 months after myocardial infraction	EMDR (n = 30) versus no intervention (n = 30) EMDR 3 sessions	Most impacting part of the cardiac incident	Depression	BDI	EMDR > no treatment: reduction in BDI scores at 4 months post.
Dominguez et al. (2020)	49	Adult outpatients at a psychiatric hospital with diagnosis of depression or anxiety	Three sessions EMDR + TAU (n = 16) versus 3 sessions assertiveness training + TAU (n = 17) versus TAU (n = 16). TAU was 10-day CBT group tx	Past or recent events that led to negative emotions	Major depressive episodes (MDE), PTSD symptoms	DASS-42, IES-R, RAS	At post, EMDR + TAU = TAU = assertiveness + TAU for improvement. At 6 weeks, EMDR + TAU = assertiveness + TAU > TAU, and at 12 weeks, EMDR + TAU was superior.
Gauhar (2016)	17	Adult outpatients with MDD without ADM	EMDR (n = 10) versus WL (n = 7), 6 to 8 sessions of EMDR	Disturbing events thought to be related to depressive cognition	Depression, PTSD symptoms, quality of life	BDI-II, Trauma Symptom Checklist-40, QOL Index	EMDR > WL: Improvement in depression, PTSD and quality of life: at post and 3-month FU.

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APPENDIX D. Overview of Effects of EMDR Therapy on Unipolar Depression as Primary Target (*Continued*)

Author(s)	*N*	Setting/Sample	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measures	Significant Results
Hase et al. (2018)	30	Adult inpatients of a psychiatric/psychosomatic rehabilitation clinic with BDI scores of > 12 and current ADM treatment	4–12 sessions EMDR + TAU (n = 14) versus TAU (n = 16). TAU: Inpatient program and psychodynamic or behavior therapy	One unprocessed memory per week	Depression and overall burden on patients	BDI-II, SCL-90-R, depression subscale, GSI	EMDR + TAU > TAU: decrease in depressive symptoms and diagnosis remission, at post and 1-year FU.
Hogan (2002)[a]	30	Adults with MDD, dysthymia, or adjustment disorder with depressed mood	EMDR (n = 15) versus CBT (n = 15). Treatment information not available	Information not available	Depression, global severity	BDI-II, SCL-90-R	EMDR = CBT: Improvement in depression.
Kao et al. (2018)	57	Depression in adults with heart failure at an outpatient clinic	EMDR (n = 25) versus control: routine care (n = 32). 4 weekly EMDR sessions 60–90 minutes. No information about routine care	Most unpleasant experience of heart failure	Depression, impact of heart failure on QOL, heart rate variability	BDI-II, MLHFQ, HRV	EMDR > control: Improvement in depression, health-related QOL and HRV at post, 1- and 3-month FU.
Lei and Zhenying (2007)[b]	64	Adult outpatient with depression (CCMD-3 and HDS $\geq$ 17)	EMDR + Sertraline (n = 32) versus Sertraline only (n = 32). EMDR: 6 weekly sessions	Information not available	Depression	HMS CGS TESS	EMDR + Sertraline > Sertraline: Improved depression at week 1 and week 2. EMDR + Sertraline = Sertraline at week 6.
Minelli et al. (2019)	22	Adults with treatment-resistant depression in an inpatient setting	Trauma-focused (TF)-CBT (n = 10) versus EMDR (n = 12). Both 24 sessions of 60 minutes over 8 weeks	EMDR: traumatic events. TF-CBT: trauma-related emotional, psychological difficulties	Depression, anxiety, sleep quality	MADRS, BDI-II, BAI, PSQI, MINI-ICF-APP	At post, TF-CBT = EMDR: Improvement in depression. At FU: EMDR > TF-CBT for depression, including neurovegetative and cognitive symptoms. At post and FU, TF-CBT = EMDR: improvement in anxiety, sleep, psychosocial deficits.

(*continued*)

APPENDIX D. Overview of Effects of EMDR Therapy on Unipolar Depression as Primary Target (*Continued*)

Author(s)	*N*	Setting/Sample	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measures	Significant Results
Ostacoli et al. (2018)	66	Adults with recurrent depression already receiving ADM	EMDR ($n = 31$) versus CBT ($n = 35$). Mean number of sessions = 15 of EMDR or CBT for at least 4 weeks	EMDR: Episode triggers, belief systems, depressive states, suicidal states	Depression, anxiety, quality of life, PTSD symptoms	BDI-II, BAI, IES-R, QOL-Bref, GAF	At post EMDR > CBT: Improvement in depression. At 6 months FU, EMDR = CBT for depression. At post and FU, EMDR = CBT for anxiety, QoL, PTSD, global functioning.
Passoni et al. (2018)	44	Caregivers of dementia patients at a hospital	EMDR-Integrative Group Treatment Protocol (IGTP), 8 weekly 2-hour group sessions. Immediate treatment versus WL/delayed.	Traumatic memory or highly stressful recollections related to the dementia	Depression, anxiety, trauma, caregiver needs, and burden.	IES-R (AD-R)	At post, immediate > WL: improvement in PTSD, depression. At 2-month FU, improvement in PTSD only. Delayed: depression reduced at posttreatment, not at 2-month FU.
Rahimi et al. (2019)	90	Adult patients undergoing hemodialysis at a hospital	TAU + EMDR ($n = 45$): 3x/week for 2 weeks versus routine care (TAU; $n = 45$) TAU: weight measurement and blood pressure control	EMDR target: trauma re hemodialysis	Anxiety, depression	HADS (Farsi version)	TAU + EMDR > TAU at posttreatment for improvement in depression and anxiety.
Su (2018)	16	Adults with MDD in an outpatient clinic	Quasi-experiment. Phase 1: EMDR ($n = 8$). Phase 2: EMDR ($n = 4$) versus CBT ($n = 4$). 10 sessions (2 sessions/week)	Depressive symptoms	Depression	PHQ-9	Phase 1 EMDR: Improvement in depression. Phase 2 EMDR = CBT: Improved depression.

(*continued*)

APPENDIX D. Overview of Effects of EMDR Therapy on Unipolar Depression as Primary Target (*Continued*)

Author(s)	*N*	Setting/Sample	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measures	Significant Results
Cohort and case-control studies							
Hase et al. (2015)	32	Adult inpatients with depressive episodes at a rehabilitation clinic	Nonrandomized controlled trial: EMDR (mean 4.6 sessions, 1–2x week) + TAU ($n = 16$) versus TAU only ($n = 16$). TAU: group tx, psychodynamic, psychoeducation, sports, relaxation	Memory of adverse life events related to depression	Depression and overall burden on patients	BDI-II, SCL-90-R depression subscale, GSI	EMDR + TAU > TAU: Improvement in depression: at post and 1-year FU.
Hofmann et al. (2014)	21	Adults with primary unipolar depression without PTSD. ADM: 9 in EMDR + CBT and 6 in CBT group	Nonrandomized controlled study: EMDR + CBT ($n = 21$) versus CBT ($n = 21$). Mean number EMDR sessions: 6.9. + 44.5 CBT. Control group: 47.1 CBT only	EMDR group: Memories related to current depression	Depression	BDI-II	At post, EMDR + CBT > CBT: Improvement in depression and remissions.
Lehnung et al. (2017)	18	Adult refugees with PTSD and depression	EMDR G-TEP: Partial randomization: EMDR G-TEP ($n = 12$) versus 1 week WL/DT($n = 6$). (2 two-hour sessions on consecutive days)	Disturbing memories or memory fragments	PTSD symptoms, depression	IES-R, BDI	EMDR G-TEP > WL. reduced PTSD. EMDR G-TEP = DT, no significant reduction in depression.
Szpringer et al. (2018)	37	Adults at an Oncology Center with glioblastoma multiforme, within 2 years of diagnosis, not qualifying for surgical intervention. No ADM	Nonrandomized, controlled trial: consent to EMDR ($n = 18$) versus control—no consent to EMDR ($n = 19$). EMDR: 10–12 sessions over 4 months.	No information available	Anxiety, depression, anger	HADS, SOC-29, Patient Caregiver questionnaire	At 4-month FU: EMDR > control: Improvement in depression, anxiety, and anger, sense of coherence.

(*continued*)

APPENDIX D. Overview of Effects of EMDR Therapy on Unipolar Depression as Primary Target (*Continued*)

Author(s)	*N*	Setting/Sample	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measures	Significant Results
Tang et al. (2015)	39	Adolescents with MDD, PTSD, or suicide risk, resulting from a natural disaster	Nonrandomized controlled trial: EMDR (n = 20) versus TAU (psychoeducation) (n = 19) EMDR: 4 sessions over 2 months	Physical distress associated with flashback memories of disaster	Anxiety, depression	C-IES-R, CES-D, MASC-T	At post, EMDR > TAU: Improvement in depression and anxiety. No FU.
Case series							
Bae et al. (2008)	2	Adolescents with MDD	Three to 7 sessions EMDR	Memories of recent stressful events	Depression	HDS	No statistical analysis. Reported depression remission and maintenance at 3-month FU.
Grey (2011)	1	Adult with MDD and comorbid panic disorder with agoraphobia	Three sessions EMDR per week over 1 month	Cognitive themes: overresponsibility, lack of power, a sense of worthlessness	Depression, anxiety	BDI-II, BAI	No statistical analysis. Reported improvement in comorbid depression and panic disorder with agoraphobia.

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APPENDIX D. Overview of Effects of EMDR Therapy on Unipolar Depression as Primary Target (*Continued*)

Author(s)	*N*	Setting/Sample	Intervention and Number of Sessions	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measures	Significant Results
Guina and Guina (2018)	1	Adult with expressive aphasia post-stroke	EMDR 24 months post-stroke with weekly 1-hour sessions over 2 months	Stroke and suicide attempt	Depression, aphasia	PHQ-9	No statistical analysis. Reported improvement in depression and aphasia. Depression remission maintained at 4-month FU.
Paauw et al. (2019)	32	Adolescents with MDD	6 weekly individual EMDR sessions	Memories of distressing event related to depressive symptoms	PTSD—symptoms, depression, anxiety, somatic complaints, and socioemotional problems	UCLA PTSD-RI, CSI, CDI, SCARED, SDQ	At post, 3-month FU: improvement in depression, PTSD, anxiety, somatic complaints, and socioemotional functioning.
Semiz et al. (2016)	3	Adults with MDD after a traumatic experience. Current ADM	Six to eight session EMDR	Trauma from violence	Depression, anxiety	BDI, BAI	No statistical analysis. Reported improvement in depression and anxiety scores posttreatment.
Wood et al. (2018)	13	Adults with long-term depression (2 or more years)	Single case experiment with multiple baselines. 2 EMDR sessions per week (max 20 sessions)	Target of treatment was not described	PTSD symptoms, depression	HDS, IES-R, PHQ-9, BDI-II	No statistical analysis. Reported improvement in depression for 7 of 8 completers.

Note. ADIS-C = Anxiety Disorders Interview Schedule for *DSM-IV* Child version; ADM = antidepressant medication; BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; CBT = cognitive behavioral therapy; CCMD = Chinese classification of mental disorders; CDI = Dutch version Children's Depression Inventory; C-IES-R = Chinese version of the Impact of Events Scale-Revised; CES-D = Mandarin version of the Center for Epidemiologic Studies Depression Scale; CGI = Clinical Global Impression Scale; CSI = Children's Somatization Inventory; DASS = Depression, Anxiety and Stress Scale; DT = Delayed treatment; EMDR = Eye Movement Desensitization and Reprocessing; GAF = Global Assessment of Functioning Scale; GSI = Global Severity Index; HDS = Hamilton Depression Scale; HRV = Heart Rate Variability; G-TEP = Group Traumatic Episode Protocol; HADS-M = Hospital Anxiety and Depression Scale; HSC = Hopkins Symptoms Checklist; HTQ = Harvard Trauma Questionnaire; IES-R = Impact of Events Scale-Revised; MADRS = Montgomery–Åsberg Depression Rating Scale; MASC-T = Taiwanese version of the Multidimensional Anxiety Scale for Children; MDD = Major Depressive Disorder; MINI = Mini International Neuropsychiatric Interview; MLHFQ = Minnesota Living with Heart Failure Questionnaire; PHQ = Patient Health Questionnaire; PTSD = posttraumatic stress disorder; QOL = Quality of Life; RAS = Rathus Assertiveness Schedule; RCT = randomized controlled trial; SCARED = Dutch version of the Screen for Child Anxiety Related Emotional Disorders; SCID = Structured Clinical Interview for *DSM*; SCL-90-R = Symptom Checklist 90 items revised; SDQ = Dutch adolescent version of the Strengths and Difficulties Questionnaire; SOC = Sense of Coherence Scale; TAU = Treatment as Usual; TESS = Treatment Emergent Symptom Scale; UCLA PTSD RI = University of California at Los Angeles Posttraumatic Stress Disorder Reaction Index Adolescent version; WL = Waiting list.

[a]Abstract available only, data stem from doctoral thesis. [b]Article published in Chinese (abstract only in English).

APPENDIX E. Overview of Effects of EMDR Therapy in Chronic and Acute Pain

Author(s)	*N*	Setting	Intervention (Number of Sessions)	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
RCTs							
Arias-Suárez et al. (2020)	28	Outpatients with chronic pain conditions	12 TAU (n = 14; 90-minute sessions; for example, medication, physiotherapy, CBT) versus 12 EMDR pain Protocol +TAU (n = 14; 90 minutes sessions) over 3 months	Disturbing memories associated with traumatic experiences and pain experiences	Pain intensity, quality of life, anxiety, depression	VAS, PDI, EQ-5D-5L, HADS	At post and 3-month FU, EMDR + TAU > TAU for improvement in pain intensity quality of life, anxiety, and depressive symptoms.
Brennstuhl et al. (2016)	45	Inpatients with chronic pain conditions	EMDR standard protocol (n = 15) versus EMDR pain protocol (n = 15) versus eclectic therapy (ET; n = 15) in addition to multidisciplinary pain management program. Five EMDR sessions in EMDR conditions	EMDR standard protocol: specific elements of traumatic events. EMDR pain protocol: sensation of pain and a mental image of this perception	Pain intensity, feelings, beliefs, and cognitions related to pain, PTSD symptoms	VAS, PBPI, PCL-S	Both EMDR protocols > ET: improvements in pain intensity, feelings, beliefs, and cognitions related to pain, and traumatic components of pain at post and 1-month FU.
Estergard (2008)	37	Outpatients with chronic pain	EMDR (n = 20) versus control/delayed treatment group (n = 17) EMDR: 6 sessions, 90 minutes	Pain-related disturbing memories	Intensity of pain, mood, and dysphoria	SF-MPQ, MAACL-R[a]	EMDR > WL for reduction of chronic pain and dysphoria.
Gerhardt et al. (2016)	40	Outpatients with chronic back pain	EMDR + TAU (n = 20) versus TAU (n = 20). EMDR: 10 sessions, 90 minutes	Disturbing memories, current pain perceptions, and anticipated future painful situations	Pain intensity, disability, treatment satisfaction	NRS, MPI-D, PGIC	EMDR plus TAU > TAU for pain reduction at post and 6-month FU.

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APPENDIX E. Overview of Effects of EMDR Therapy in Chronic and Acute Pain (*Continued*)

Author(s)	*N*	Setting	Intervention (Number of Sessions)	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Marcus (2008)	52	Outpatients with acute migraine	One 60-minute session of integrated EMDR ($n = 26$) versus standard care medication (SCM; $n = 26$)	Interoception/focus on diaphragmatic breathing	Intensity of pain	SPL, MIDAS, HDI	Integrated EMDR > SCM for immediate pain relief. EMDR = SCM at 1, 2, and 7-day FU.
Maroufi et al. (2016)	56	Adolescent inpatients with acute pain after abdominal surgery	EMDR ($n = 28$) versus neutral interview (NI) ($n = 28$). Both EMDR and NI, 1 session, 60 minutes	Negative beliefs or images associated with the surgery	Intensity of pain	WBFS	EMDR > NI: pain reduction at post.
Nia et al. (2018)	75	Outpatients with chronic musculoskeletal pain due to rheumatoid arthritis	EMDR ($n = 25$) versus guided imagery (GI) ($n = 25$) versus TAU ($n = 25$). EMDR 6 sessions, 45–90 minutes, GI 6 sessions	Disturbing memories	Intensity of pain	RAPS	EMDR > GI > TAU for reduction in pain intensity.
Rostaminejad et al. (2017)	60	Outpatients with phantom limb pain	EMDR ($n = 30$) versus no treatment ($n = 30$). EMDR 12–60 minutes sessions in 1 month	Memories of initial injury, amputation, related difficulties in functioning, pain sensation	Intensity of pain	SUD, PRS	EMDR > no treatment for pain intensity at post and 24-month FU.

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APPENDIX E. Overview of Effects of EMDR Therapy in Chronic and Acute Pain (*Continued*)

Author(s)	*N*	Setting	Intervention (Number of Sessions)	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Case series or studies not controlled							
Allen (2004)	4	Outpatients with chronic pain conditions	Nine EMDR sessions	Disturbing memories associated with traumatic experiences and pain experiences	Pain intensity, trauma symptoms, anxiety, depression	IES, BAI, BDI, VAS, SFMPQ	EMDR: improvement in pain, negative affect, and self-efficacy in managing pain at post and FU.
Brennstuhl et al. (2015)	2	Outpatients with phantom breast syndrome	9–12 sessions EMDR, 90 minutes	Traumatic events related to disease experience and phantom breast sensation	Pain intensity, intensity of the sensation, depression, anxiety	STAI, CES-D, PBS	No statistical analysis. Reported positive results.
De Roos et al. (2010)	10	Outpatients with phantom limb pain	3–10 EMDR sessions (mean 5.9), 90 minutes	Memories of traumatic experiences and pain experiences, actual pain	Pain intensity, fatigue, psychological distress, PTSD symptoms, quality of life	SCL-90, CIS-20R, IES, SIL, SF-36	At post and long-term FU, EMDR: decrease in pain, and on most psychological measures. No effect for physical function.
Friedberg (2004)	6	Outpatients with fibromyalgia and chronic fatigue syndrome	Two EMD sessions, 60 minutes	Most salient sensation or feeling	Fibromyalgia impact, fatigue, depression, anxiety	FIQ, FS, BAI, BDI	No statistical analysis. Reported positive results.

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APPENDIX E. Overview of Effects of EMDR Therapy in Chronic and Acute Pain (*Continued*)

Author(s)	*N*	Setting	Intervention (Number of Sessions)	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Gauvry et al. (2013)	1	Inpatient adolescent with CRPS	Five EMDR sessions, 90 minutes over 2 weeks	Memories of medical experiences and pain	Pain intensity, trauma symptoms	CPSRI, SUD	No statistical analysis. Reported positive results.
Grant and Threlfo (2002)	3	Outpatient with chronic musculoskeletal pain	EMDR Chronic Pain Protocol, 9 sessions, 60 minutes	Disturbing memories associated with traumatic experiences and pain experiences	Intensity of pain, cognitive and behavioral pain-coping strategies	SFMPQ, CSQ, SUD	No statistical analysis. Reported positive results.
Hassard (1995)	27	Outpatients with chronic pain	EMD combined with medication or CBT if deemed necessary. 1–11 sessions, mean 4	Disturbing memories associated with traumatic experiences and pain experiences	Pain intensity disability, mood state	NHP, HADS	At post: a large decrease in some, but not all, psychological measures. No effects observed with sleep or pain. At 3-month FU, only effect was for emotion reactions and energy.
Hughes (2014)	1	Outpatient with CRPS	14 EMDR sessions	Memories of traumatic experiences and pain experiences	Pain intensity, substance dependence, mood state	–	No statistical analysis. Reported positive results.
Kavakci et al. (2012)	7	Outpatients with fi bromyalgia	Five to 8 EMDR sessions, 60–90 minutes	Disturbing memories associated with traumatic experiences and pain experiences, actual pain	Pain intensity disability, mood state, tender points, sleep, anger, PTSD	VAS, FIQ, BDI, TPC, PSQI, STAS, PDS	EMDR; decrease in perceived pain, tender point counts, trauma and depressive symptoms, and improved sleep and quality of life.

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APPENDIX E. Overview of Effects of EMDR Therapy in Chronic and Acute Pain (*Continued*)

Author(s)	*N*	Setting	Intervention (Number of Sessions)	Memories/Phenomena Targeted	Outcomes/Dependent Variables	Measure(s)	Significant Results
Konuk et al. (2011)	11	Outpatients with migraine	Variable amount of sessions (mean 8)	Trauma memories associated with headaches	Pain intensity, duration, medication, emergency room (ER) visits, psychological state	EMDR-HTIF, SCID, SA-45, WHQ	At post, 3-month FU, EMDR: decrease in headache frequency and duration but not pain intensity. Decrease in the use of painkillers and ER visits.
Mazzola et al. (2009)	38	Outpatients with chronic pain	12 EMDR sessions, 90 minutes	Memories of traumatic experiences and pain experiences	Pain intensity, depression, quality of life	SF-36, STAI, BDI, SCID, VAS	EMDR: decrease in pain sensations, pain-related negative affect, anxiety, depression.
Russell (2008a)	1	Outpatient with phantom limb pain	Five EMDR sessions	Memories related to pathology, triggers, future adaptive responses	Pain intensity, depression, PTSD symptoms	IES, BDI, NRS	No statistical analysis. Reported positive results.
Schneider et al. (2007)	1	Outpatient with phantom limb pain	Nine EMDR sessions	Memories related to physical condition, phantom limb pain	Pain intensity, PTSD symptoms, depression	SCID, IES, BDI, VAS	No statistical analysis. Reported positive results.
Schneider et al. (2008)	5	In- and-outpatients with phantom limb pain	Three to15 EMDR sessions, 50–90 minutes	Memories of pain, self-esteem, triggers, thoughts of the future	PTSD symptoms, depression	IES, BDI	No statistical analysis. Reported positive results.
Wilensky (2006)	5	Outpatient with phantom limb pain	Three to 9 EMDR sessions	Memories of accident, related events, physical sensations	Pain intensity, trauma symptoms, depression	IES, PDI, TSI, BDI	No statistical analysis. Reported positive results.

Note. BAI = Beck Anxiety Inventory; BDI = Beck Depression Inventory; CLBP = Chronic low back pain; CIS-20R = Checklist Individual Strength-Revised; CRPS = Complex Regional Pain Syndrome; CSQ = Coping Skills Questionnaire; EMDR = Eye Movement Desensitization and Reprocessing; FIQ = Fibromyalgia Impact Scale; FS = Fatigue Scale; HADS = Hospital Anxiety and Depression Scale; HDI = Headache Disability Inventory; IES = Impact of Event Scale; IES-R = Impact of Event Scale-Revised; MAACL-R = Multiple Affect Adjective Checklist-Revised; MBHI = Millon Behavioral Health Inventory; MIDAS = Migraine Disability Assessment Scale; NHP = Nottingham Health Profile; NRS = Numeric Rating Scale; PDI = Pain Disability Index; PDS = PostTraumatic Diagnostic Scale; PLP = Phantom limb pain; PPI = Present Pain Intensity; PRI = Pain Rating Index; PSQI = Pittsburgh Sleep Quality Index; PTSD = posttraumatic stress disorder; SA-45 = Symptom Assessment-45 Questionnaire (derived from the SCL-90); SCM = Standard Care Medication'; SF-36 = Short-Form Health Survey; SFMPQ = Short-Form McGill Melzack Pain Questionnaire; SIL = Self-Inventory List; STAI = State-Trait Anxiety Inventory; STAS = State-Trait Anger Scale; SUD = Subjective Units of Discomfort; TAU = Treatment as Usual; TPC = Tender Point Count; VAS = Visual Analogue Scale; WHQ = Weekly Headache Questionnaire.

[a]As data were reported incompletely, no pre/post-calculations were possible.