

Eye Movement Desensitization and Reprocessing (EMDR) treatment in the medical setting: a systematic review

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Abstract

Background

This systematic literature review aims to evaluate the use and effectiveness of Eye Movement Desensitization and Reprocessing (EMDR) therapy in adult patients treated in the medical setting.

Methods

We performed a systematic literature search of MEDLINE, Web of Science, PsycINFO, and the Cochrane Central Register of Controlled Trials, following the PRISMA guidelines. Studies were included if the effectiveness of EMDR was assessed in adult patients treated in a medical setting. Excluded were patients exclusively suffering from a mental health disorder, without somatic comorbidity. A risk of bias analysis was performed. This review was specified in advance and registered on PROSPERO ([CRD42022325238](https://www.crd.york.ac.uk/prospero/show_record.php?ID=CRD42022325238)).

Findings

89 studies are included and categorized in 14 medical domains: pain, oncology, neurology, obstetrics, otorhinolaryngology, rheumatology, cardiology, gynecology, dentistry, dermatology, pulmonary medicine, internal medicine, nephrology, and intensive care unit. In addition, three studies focusing on persistent physical complaints were included. Most frequently used outcomes were anxiety, depression, PTSD symptoms, and pain. These outcomes were assessed by study-specific and validated outcome measures. EMDR was found to be adequate in reducing symptoms in nearly all studies included (87/89). Only two studies, within the field of

gynecology, reported either no beneficial effects or that the beneficial effects did not remain over time. Notably, the occurrence of adverse events was rarely mentioned.

Interpretation

EMDR seems to have a beneficial effect on improving psychological and physical symptoms, including anxiety, PTSD, and pain, in adults treated in a medical setting. Most evidence exists for its application in the fields of oncology, pain, and neurology. The average treatment duration was relatively short, which further improves applicability in the medical setting.

Introduction

The medical setting is characterized by people who have experienced adverse health-related, and sometimes even life-threatening events, which may lead to the development of post-traumatic stress disorder (PTSD). Eye Movement and Desensitization Processing (EMDR)-therapy has proven to be an effective psychological treatment and is recommended as treatment of choice in multiple international guidelines for post-traumatic stress disorder, such as the NICE and APA-guidelines.^{1,2}

EMDR-therapy was developed in the eighties of the last century by Francine Shapiro.³ Latest meta-analyses on the effectiveness of EMDR-therapy in treating patients with posttraumatic stress disorder (PTSD), show that the therapy is equally effective as cognitive behavioral therapy (CBT).^{4,5} More recently, the application of EMDR-treatment for psychiatric disorders other than PTSD has been the subject of research, with most studies focusing on its effectiveness in reducing anxiety.⁶ This seems logical, as psychotrauma and anxiety are etiologically closely related. Having experienced adverse events as a rationale for EMDR-therapy, along with its relatively rapid effects and the lack of having to make homework assignments make this type of therapy suited for application in the medical setting. This also benefits society as integrated care leads to a decrease in healthcare consumption, and thus costs.⁷⁻⁹

The application of EMDR-therapy in the medical setting is not new. Luber has summarized treatment protocols for a variety of diseases and disorders including cancer, multiple sclerosis, and pain.¹⁰ Also, Francine Shapiro herself wrote an article on the role EMDR-therapy could play in the medical setting, in which she described how both psychological and physical symptoms could stem from adverse life events.¹¹ Since then, the field has further evolved, to such an extent that it may be difficult to get a comprehensive overview. Therefore, this study aims to provide a contemporary and state-of-the-art overview of available applications and effectiveness of EMDR-therapy for patients treated in the medical setting.

Methods

Protocol and Registration

The protocol for this systematic review was specified in advance and registered on PROSPERO ([CRD42022325238](https://www.crd42022325238)). The present study was performed according to the PRISMA guidelines for systematic reviews.¹²

Inclusion and exclusion criteria

Articles were included if they focused on evaluating the effectiveness of EMDR treatment on adult patients with (1) somatic symptoms, or psychological symptoms related to and combined with somatic symptoms, if patients were (2) treated in a medical setting, and (3) outcomes used

to measure the effectiveness of the EMDR intervention were reported. No restrictions were made regarding the outcome measures. Protocols that included real life cases of patients were also eligible for inclusion. Excluded were articles that focused on the effectiveness of EMDR (i) in patients exclusively suffering from psychological complaints, (ii) in patients with eating disorders, (iii) solely in the patients' relatives or caregivers, (iv) in children and adolescents, and (v) on healthcare providers. Also excluded were (vi) articles wherein patients were treated with Eye Movement (EM) or Eye Movement Desensitization (EMD), (vii) if EMDR therapy was combined with, or was integrated into a treatment program that included multiple types of psychotherapy and the effects of EMDR alone could not be evaluated. Studies were also excluded if (viii) the treatment was provided in military hospitals, if (ix) no outcome was reported, e.g., protocols without cases, and if (x) no full text could be retrieved, even after repeated effort. Further, (xi) poster abstracts were excluded. There were no restrictions regarding the date of publication, nor were there restrictions on the language the articles were written.

Search terms and databases

The main search terms were "Eye Movement Desensitization Reprocessing", "Post Traumatic Stress Disorders", "Depression", and "Anxiety". This search was applied to Embase.com (1971-present), Medline ALL Ovid (1946-present), Web of Science Core Collection (1975-present), Cochrane Central Register of Controlled Trials (1992–present), and PsycINFO Ovid (1806–present). The final search was run on April 18, 2023. The full search strategy is reported in Supplementary Table 1. Furthermore, the reference lists of all relevant studies were checked to find additional studies.

Procedures

Two reviewers (HD, SM) screened all article titles and abstracts for relevance. If the title and abstract were considered relevant regarding the aim of our study, the article was included for the assessment of the full text. In case of disagreement, the two reviewers aimed to reach a consensus. In case this turned out to be difficult, a third reviewer was involved to come to a conclusion (LK). All included papers were read by two reviewers (HD, SM) to assess whether the studies were eligible for inclusion, based on the above mentioned criteria. Again, in case of disagreement, the two reviewers aimed to reach a consensus. A third reviewer (LK) was involved to come to a conclusion, in case consensus proved difficult. Included reviews were screened for relevant articles. Relevant articles found in the reviews were included and assessed individually in the current study. The risk of bias of the studies was assessed with appropriate instruments according to their study design: the Cochrane risk-of-bias tool for randomized trials, version 2 (ROB-II),¹³ the Risk Of Bias In Non-randomized Studies of Interventions (ROBINS-I) tool,¹⁴ the IHE (Institute of Health Economics) Quality Appraisal Checklist for Case Series Studies,¹⁵ and the Johnna Briggs Institute (JBI) Critical Appraisal Checklist for Case Reports.¹⁶

Data extraction

Two authors (HD, SM) evaluated and extracted the data of all included studies. The information was discussed by 3 authors (HD, SM, LK). Information was extracted regarding the (1) type of study design, (2) involved medical domain and illness, (3) medical setting in which patients were treated, (4) whether patients were inpatients or outpatients, (5) additional diagnoses, (6) treatment and treatment schedules, (7) outcomes and outcome measures to assess the effectiveness of the intervention, and (8) reported results for every outcome.

Results

Study selection

A total of 5538 studies were retrieved from databases, and ten additional articles were identified through cross-referencing. A total of 3135 studies were eligible for screening after duplicates were removed and eventually 368 studies were assessed for eligibility for inclusion. 105 studies were considered eligible of which 89 studies were included. 16 studies were reviews and are not discussed as these reviews have a different focus of attention compared to our review, except for one review in which a case study is described.¹⁷ Details of these reviews are described in Supplementary Table 2 for the sake of completeness. If the full text of the studies was not retrievable via standard electronic subscriptions of the Erasmus Medical Center academic library, we sent an international request to other libraries. If that also failed, we approached the authors by email. Procedures and search results are described in Figure 1 and supplementary Table 2.

Study characteristics

An overview of the characteristics of the 89 articles included is given in Supplementary Table 3. 26 (pilot-)RCTs, 24 case reports, 20 non-randomized clinical studies, and 19 case series are included. The result section of this review consists of general results and results categorized per medical domain. All studies reported pre- and post-treatment measurements. The study designs and the reported outcomes were found to be heterogeneous and, consequently, a meta-analysis was not performed.

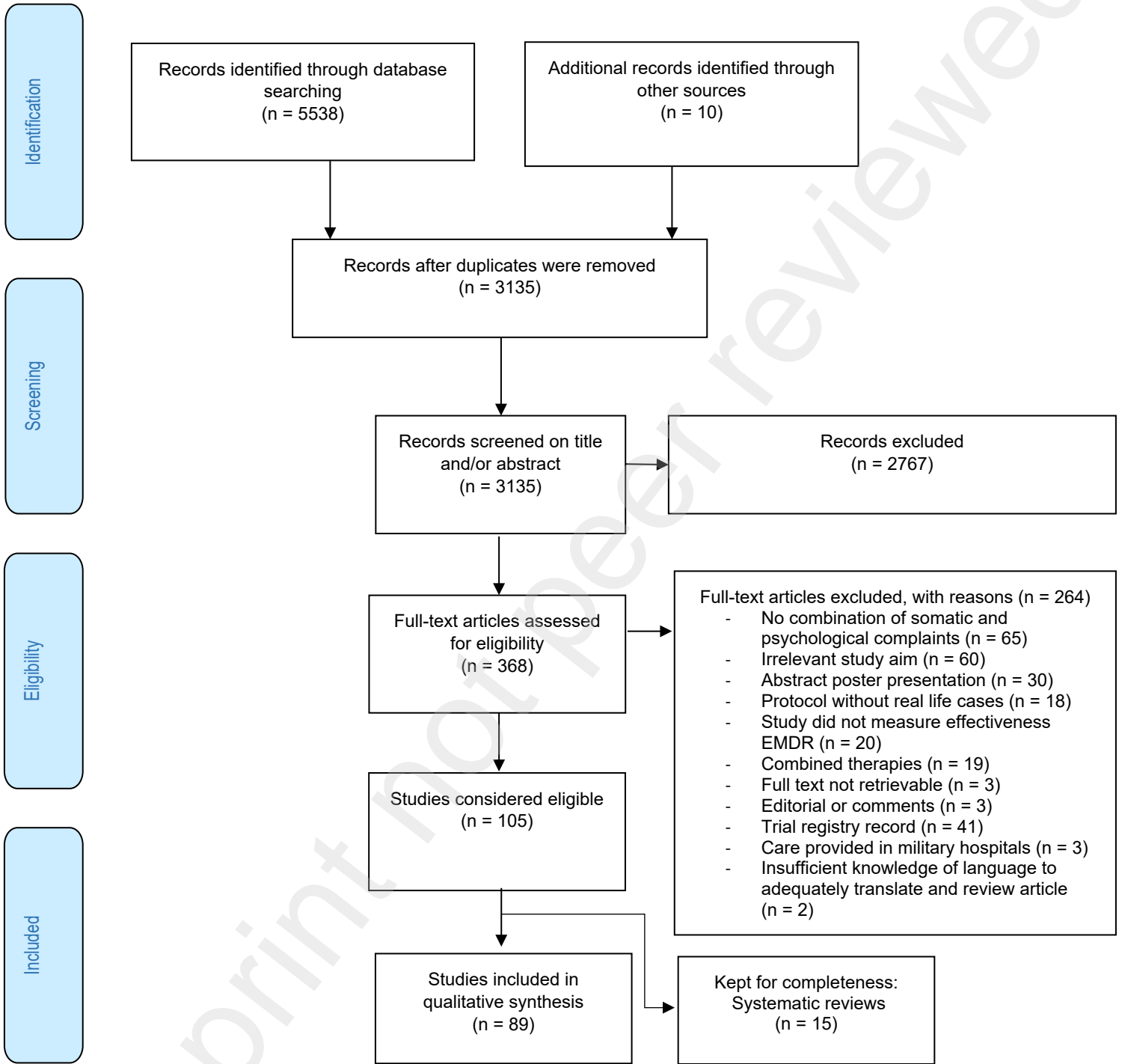
General results

Treatment details, outcomes, and results of the articles included are categorized by medical domain and summarized in Supplementary Tables 4A-4O. Half of all studies described providing EMDR treatment exclusively at a (university) hospital (46/89), 10 studies exclusively provided treatment at specialized clinics, 17 studies described providing treatment at locations categorized as 'Other', e.g., private practices or online, and five studies described providing treatment at two different settings. The remaining 11 studies did not describe where the treatment was provided. In most cases (54/89), treatment was provided to patients visiting outpatient centers, private practices, and hospital departments, 19 studies described providing care to inpatients, two studies described providing care in both inpatient and outpatient settings, and 14 studies did not describe whether patients were treated as inpatients or whether patients visited outpatient locations.

Risk of bias

Most case reports described pre- and post-intervention clinical condition (24/24), assessment methods (21/24), and treatment procedure (24/24), only a minority reported whether there were adverse events (6/24) (Supplementary Table 5A). Most case series clearly described patient characteristics (18/19), intervention (17/19), pre- and post-intervention clinical condition (17/19), and used appropriate outcome methods (17/19). The studies did not (fully) report eligibility criteria (13/19), co-interventions (13/19), statistical analysis (14/19), and adverse events (11/19) (Supplementary Table 5B). Most RCTs showed a high risk of bias (16/26), the minority showed some concerns (10/26). Areas of concern included adherence to the intervention, the randomization process, and outcome measurements, mainly due to the subjective measures used. The non-randomized clinical studies showed moderate (17/20) or serious (3/20) bias mainly because of the measurements of outcomes used.

Figure 1: Flowchart of literature search and study selection



Main findings per medical domain

Pain

The domain of pain includes 16 studies, divided into nine studies focusing on phantom pain and seven studies focusing on chronic pain (Supplementary Table 4A). The efficacy of EMDR on phantom pain was evaluated on pain, including intensity and disability in all nine studies,¹⁸⁻²⁶ the use of pain medication,^{19,20} intensity of sensation,^{22,23} Quality of Life (QoL),²⁴ fatigue,²⁴ psychological problems and symptoms of psychopathology,^{18,24} emotional distress,^{25,26} and symptoms of anxiety,^{18,22,23} depression,^{18,22,23,26} and PTSD.^{19,24,26} All studies reported beneficial effects of EMDR when comparing measurements before and after treatment. The majority (8/9) reported a follow-up up to 40 months and reported that the beneficial effects remained over time. Only one study focusing on phantom pain was a RCT. The study showed significant reductions of pain intensity and emotional distress in the EMDR group, whereas the control group showed significant worsened symptoms.²⁵

The efficacy of EMDR in patients suffering from chronic pain was evaluated on pain intensity in all studies,²⁷⁻³³ on QoL,^{30,31} disability,²⁷ patients' perspective of change,²⁷ coping,²⁹ and symptoms of anxiety,^{30,31} depression,^{30,31} and PTSD^{32,33} (Supplementary Table 3A). All studies reported beneficial effects of EMDR when comparing measurements before and after treatment. The majority (6/7) reported a follow-up up to three months and reported that the beneficial effects remained over time. Three out of seven studies that focused on the efficacy of EMDR on chronic pain were pilot RCTs. Two out of three pilot RCTs reported beneficial effects of EMDR over TAU.^{27,30} The remaining pilot RCT compared an EMDR standard protocol to an EMDR pain protocol and control psychotherapy and found beneficial effects of both EMDR protocols over control therapy, in favor of the standard protocol which was found to be significantly better compared to the pain protocol.³²

Neurology

15 studies described the efficacy of EMDR in neurological disorders and focused on patients suffering from: dementia,³⁴⁻³⁶ multiple sclerosis (MS),^{37,38} stroke,³⁹⁻⁴¹ amyotrophic lateral sclerosis (ALS),⁴² spinal cord injury,^{43,44} migraine,⁴⁵ psychogenic seizures,⁴⁶ and concussion-like symptoms.⁴⁷ One study did not specify which neurological condition the patients suffered from.⁴⁸ See Supplementary Table 4B. The efficacy of EMDR was evaluated on emotional distress,^{36,44,48} QoL,^{37,38} and symptoms of depression,^{34,36-39,41,43,44} anxiety,^{34,36-38,41,43} worry,³⁸ cognitive avoidance,³⁸ and PTSD,^{37,40,41,47} self-esteem,⁴⁰ and post-traumatic growth.⁴¹ Additionally, multiple studies focused on treating symptoms of specific disorders,^{35,37,44-47} e.g., fatigue in patients with MS. All studies reported beneficial effects of EMDR when comparing measurements before and after treatment, except for one case study: the study reported that the symptoms of anxiety and depression remained consistent although the patient, suffering from Alzheimer's disease, subjectively reported less distress.³⁶ The majority (12/15) reported a follow-up up to 13 months and reported that the beneficial effects remained over time. Moreover, two out of three (pilot) RCTs included reported beneficial effects of EMDR over controls,⁴³ TAU,⁴⁷ and reassurance,⁴⁷ the remaining RCT found beneficial effects of both interventions: EMDR and relaxation therapy (RT).³⁷

Oncology

14 studies described the use of EMDR in cancer patients: see Supplementary Table 4C. Most studies studied EMDR in patients with several types of cancer in different cancer stages,⁵⁰⁻⁵⁷ three studies specifically in breast cancer patients,⁵⁸⁻⁶⁰ one study in patients with glioblastoma,⁶¹ one study in patients with gastrointestinal cancer,⁶² and one case study describes the efficacy of

EMDR in a patient with larynx carcinoma undergoing radiotherapy.⁶³ Main outcome measures were: PTSD symptoms,^{50,52,54-56,58,59,64} anxiety,^{50-52,56,58,59,61,63} depression,^{50,52,56,58,59,61} pain,^{51,53} distress,^{60,62} sleeping disturbances,⁵¹ and QoL.^{59,61} All studies reported a beneficial effect of EMDR on the mentioned outcome measures. The effect remained during the follow-up periods up to six months.^{52-56,59} Within performed RCTs, the effect of EMDR seemed superior to the effects of TAU,^{53,56,58,61,62} and CBT,^{50,57} whereas CBT came out as an effective intervention too.

Obstetrics

Within the domain of obstetrics eight studies reported on the efficacy of EMDR, mostly after traumatic childbirth (6/8): See Supplementary Table 4D.⁶⁵⁻⁷⁰ The other two studies described the use of EMDR in women with hyperemesis gravidarum⁷¹ and anxiety during pregnancy.¹⁷ All studies described the effect of EMDR directly post intervention. Five studies followed the studied women from weeks up to years after EMDR.^{17,66,67,70,71} All studies that evaluated on PTSD symptoms reported a (significant) positive effect of EMDR after treatment.^{17,65-68} Further, one RCT reported no significant effect of one EMDR session on maternal bonding,⁶⁶ where a case study described a positive effect with six EMDR sessions.⁷⁰ Two studies described a positive effect of EMDR on pregnancy-related anxiety,^{17,69} of which one was a RCT.⁶⁹ One RCT evaluated on post-partum depressive symptoms, in which no significant effect of one EMDR session was seen compared to one supportive psychological consultation.⁶⁶ In one case series study, EMDR seemed effective in reducing nausea and vomiting in four women with hyperemesis gravidarum.⁷¹

Otorhinolaryngology

Six studies evaluated the use of EMDR in tinnitus patients: see Supplementary Table 4E. In two studies, EMDR was performed after tinnitus retraining therapy (TRT).^{72,73} Tinnitus-related outcome measures were: tinnitus-related disability,⁷⁴⁻⁷⁶ discomfort and distress,^{72,73,76,77} and loudness.⁷² Additionally, the effect on depression and anxiety was studied.^{72,74,75} Overall, EMDR treatment showed to have a positive effect on tinnitus-related outcomes in all studies. The effect remained during follow-up up to six months.^{72-75,77} In one RCT, the effect of EMDR was not superior to the effect of CBT.⁷² One interventional study described no significant effect on depression and anxiety,⁷⁵ whereas one RCT measured a reduction of anxiety and depression,⁷² and one interventional study described only a reduction of depressive symptoms.⁷⁴ Eventually, one case study described a positive effect of EMDR on vision, anxiety and distress in a patient with daytime blindness.¹²⁷

Rheumatology

Two studies described the efficacy of EMDR in rheumatoid arthritis (RA) patients,^{78,79} and three studies in fibromyalgia patients.⁸⁰⁻⁸² see Supplementary Table 4F. In two RCT studies, the effect of EMDR was compared to guided imagery in RA patients.^{78,79} Pain and insomnia were measured before and two weeks after treatment without follow-up. For both measurements, there was a significant beneficial effect of EMDR, superior to guided imagery. Two multiple case studies and one case study described the effect of EMDR in fibromyalgia patients.⁸⁰⁻⁸² EMDR was evaluated on physical symptoms (fibromyalgia symptoms and pain) and psychological symptoms (PTSD symptoms, depression, sleep and anger control). Overall, there was a reduction in physical as well as psychological symptoms after EMDR treatment in those three studies.

Pulmonary medicine

Five studies focused on the efficacy of EMDR in pulmonary disorders: four studies focused on COVID-19 and one study on COPD (Supplementary Table 4G). The efficacy of EMDR was evaluated on symptoms of distress,⁸³⁻⁸⁵ anxiety,^{83,84,86} depression,^{83,84,86} PTSD,^{86,87} fear,⁸³ dissociative disorders,⁸⁵ dyspnea, fatigue, emotional function and mastery,⁸⁴ QoL,^{84,86} resilience⁸⁶ and appetite and predicted weight.⁸⁶ Additionally, one study conducted interviews⁸⁴ and one study evaluated the feasibility of delivering online therapy.⁸⁶ All studies found significant beneficial effects of EMDR when comparing measurements before and directly after treatment, although not on every outcome measure, and these effects remained at follow-up.^{83,86,87} One RCT study compared EMDR+TAU to TAU and found significant improvements in the EMDR+TAU group but did not find a significant difference between groups.⁸⁶

Cardiology

Four studies described the use of EMDR in cardiac events and all studies were (pilot-)RCTs: see Supplementary Table 4H. One study focused on the efficacy of EMDR in cardiac events and the remaining three studies specifically focused on patients who have suffered a myocardial infarction (MI). The efficacy of EMDR was evaluated on symptoms of anxiety,^{49,88,89} depression,^{49,90} and PTSD.⁴⁹ All studies reported significant beneficial effects of EMDR when comparing measurements before and after treatment. Moreover, significantly greater effects of EMDR were found compared to other treatments, including Imaginal Exposure,⁴⁹ CBT,⁸⁸ and control groups,⁸⁸⁻⁹⁰ which remained during follow-up. Some studies reported that other treatments^{49,88} and control groups⁸⁹ also showed significant beneficial effects. Conversely, one study reported a significant increase of symptoms in the control group compared to pre-treatment measurements.⁹⁰

Gynecology

Four studies described the efficacy of EMDR on gynecologic conditions: see Supplementary Table 4I. Three studies focused on sexual functionality: two studies specifically concentrated on women with vaginismus^{91,92} and one study focused on a woman's status after hysterectomy.⁹³ The fourth study focused on participants suffering from dysmenorrhea.⁹⁴ All studies described a follow-up period. The efficacy of EMDR was evaluated on symptoms of anxiety,^{91,92,94} sexual functioning,^{91,93} emotional distress,⁹² dysfunctional beliefs,⁹² QoL,⁹¹ and sexual satisfaction.⁹¹ Three out of four studies found significant beneficial effects of EMDR when comparing measurements before and directly after treatment,⁹¹⁻⁹³ of which one study reported that the results did not remain at follow-up.⁹¹ One RCT study that focused on dysmenorrhea compared EMDR to no interventions did not find a statistically and clinically significant effect of EMDR.⁹⁴

Dentistry

Three studies focused on the efficacy of EMDR on dental problems of which one study focused on psychological problems caused by idiopathic pain and two focused on dental phobia: see Supplementary Table 4J. The efficacy of EMDR was evaluated on dental anxiety and fear^{95,96}, psychological problems,^{96,97} psychological trauma,⁹⁶ severity of dental phobia,⁹⁶ and symptoms of anxiety, depression, and PTSD.⁹⁵ All studies found significant beneficial effects of EMDR when comparing measurements before and after treatment, and during follow-up. A RCT focused on dental phobia and compared EMDR to waitlist and found that EMDR showed significant reductions of dental anxiety.

Dermatology

Two studies focused on the efficacy of EMDR in dermatologic disorders, of which one study specifically focused on atopic dermatitis: see Supplementary Table 4K. Both studies reported beneficial effects of EMDR which remained over time at follow-up. The case study reported improvements of the patient's symptoms of PTSD, depression, and anxiety, and itching behavior.⁹⁸ A multiple case study reported improvements in all patients with dermatological disorders in terms of dermatologic symptoms and emotional distress.⁹⁹

Persistent physical complaints

In three studies, the effect of EMDR was described in patients with persistent physical complaints without a somatic substrate, namely body dysmorphic disorder (BDD),¹⁰⁰ somatic symptom disorder,¹⁰¹ and chronic fatigue syndrome:¹⁰² see Supplementary Table 4L. A multiple case study showed a positive effect of EMDR on BDD symptomatology in six out of seven included patients. The positive effect remained during follow-up (one year).¹⁰⁰ One RCT compared EMDR to pharmacological treatment with duloxetine in patients with somatic symptom disorder. Both interventions showed a statistically significant reduction of somatization, anxiety and depression, with a superior effect of EMDR.¹⁰¹ A case study found favorable effects of EMDR in a patient with chronic fatigue syndrome: there was a reduced need for sleep and energy levels were higher, which remained at follow-up.¹⁰²

Internal medicine

A RCT focused on the efficacy of EMDR compared to control on the fear of hypoglycemia among patients with diabetes mellitus type 2.¹⁰³ They found a significant reduction of fear of hypoglycemia in the EMDR group compared to the pre-intervention levels and to the control group, which remained at follow-up: see Supplementary Table 4M.

Nephrology

One RCT evaluated the effectiveness of EMDR compared to a control group on anxiety and depression in patients that received hemodialysis.¹⁰⁴ The study found a significant reduction of the symptoms of anxiety and depression in the EMDR group compared to the pre-intervention levels and to the control group, two weeks post-intervention: see Supplementary Table 4N.

Intensive care unit

One case study described a positive effect, lasting up to four months after treatment, of online performed EMDR on depression, anxiety and QoL in a patient who survived ICU admission and suffered from PTSD afterwards:¹⁰⁵ see Supplementary Table 4O.

Discussion

To our knowledge, this is the first systematic literature review that evaluated the use and effectiveness of EMDR-therapy for adult patients treated in the medical setting, including hospitals, extramural specialized clinics and private clinics, in which the treatment can be extrapolated from hospitals, across various medical domains. The vast majority of studies found favorable effects of EMDR within multiple domains and outcomes. Moreover, the treatment appeared to be applicable in both inpatients and outpatients in the medical setting. The study designs and the reported outcomes were found to be heterogeneous and, consequently, a meta-analysis could not be performed.

87 of 89 studies found favorable effects of EMDR within multiple domains and outcomes. Only two studies, within the field of gynecology, reported either no beneficial effects or that the beneficial effects did not remain over time.^{91,94}

This review aimed to provide a state-of-the-art overview including all relevant articles, regardless of the type of study design. Consequently, many case studies and series were included (44/90) and 26 of the studies included were (pilot)RCTs. Notably, all but one RCTs found significant favorable effects of EMDR pre- and post-treatment. Ten RCTs compared EMDR to no treatment/waiting list: seven studies found significant differences between EMDR-therapy and waiting list controls in favor of EMDR-therapy, two studies reported significant beneficial effects in both EMDR and waiting list control groups, and one study did not find significant differences in both groups.⁹⁴ Additionally, 18 studies compared the use of EMDR to other treatments. 11 studies described significant effects of both interventions of which nine studies reported differences between groups in favor of EMDR-therapy. The remaining six studies reported only significant favorable effects of EMDR-therapy.^{25,27,30,53,62,69}

The studies included varied in terms of risk of bias: the overall appraisal of these studies showed at least moderate to high risks of bias. Although, it should be noted that concerns regarding measurement of the outcome are inevitable as, like many practice-based research in psychology, it is impossible to blind patients to the type of therapy they receive. Moreover, a vast majority of the included studies did not mention whether there were any adverse events during EMDR treatment. Although this could be interpreted as an affirmation of the feasibility of EMDR in the medical setting, supported by low chance of adverse events, reporting biases are not unthinkable. Therefore, future research should aim for randomized controlled studies, in which adverse events, and treatment adherence are explicitly mentioned.

Many different outcome measures were used in the included studies, ranging from disease-related (e.g. pain, skin condition), to relatively generic outcome measures for mental health (e.g., anxiety, depression), and specifically PTSD. The use of disease-specific outcome measures leads to the question of how it is possible that a therapy developed to treat PTSD also affects physical symptoms, in 'somatically ill' patients without PTSD. In this respect, it is key to realize that people with physical illness can also suffer from psychological trauma, where their own body is perceived to be the perpetrator.¹⁰⁶ Medical trauma then, is defined as 'extremely stressful experiences caused by the somatic disorder itself or by subsequent medical treatment'.¹⁰⁷ Shapiro's adaptive information processing (AIP) model,¹⁰⁸ offers a solution in explaining how the lasting effect of extremely stressful illness-related experiences - which take the form of physical symptoms - can be reversed by EMDR therapy. The premise of the AIP model is that many kinds of psychopathology can be seen as the result of disruptive experiences (in the form of images, emotions, cognitions, bodily sensations) that are stored in the nervous system at the time of the event. EMDR-therapy makes the stored traumatic experience accessible while at the same time activating the natural processing system. It is hypothesized that symptoms diminish because a new connection is established in the neural network between stored dysfunctional information, and other existing, more healthy information and perceptions.

Some evidence for the effectiveness of EMDR was also found for persistent physical complaints. It can be debated whether these studies completely fit in the scope of this review, as we aim to evaluate EMDR in the medical setting in patients with somatic morbidity. However, since persistent physical complaints account for a large part of healthcare consumption in

primary and secondary healthcare,¹⁰⁹ and form an important part of daily hospital practice, we also included these three studies.

Surprisingly, no studies were performed within the domains of surgery and preoperative anesthesiology. In a medical setting, high incidence of anxiety is found in patients expecting an operation.¹¹⁰ Moreover, psychiatric disorders increase the risk for preoperative anxiety.¹¹¹ Though a lot of interest has gone out on psychological interventions to decrease preoperative anxiety,¹¹² no studies on the efficacy of EMDR have been performed. In the light of this review's results, EMDR might be a fast and beneficial intervention to reduce preoperative anxiety in a medical setting.

Conclusions

EMDR seems to have a beneficial effect on improving psychological and physical symptoms, including anxiety, PTSD, and pain, in adults treated in a medical setting. Most evidence exists for its application in the fields of oncology, pain, and neurology. The average treatment duration was relatively short, which further improves applicability in the medical setting.

Panel: research in context

Evidence before this study

The application of EMDR-therapy in the medical setting is not new. Francine Shapiro herself wrote an article on the role EMDR-therapy could play in the medical setting. Since then, the field has further evolved, to such an extent that it may be difficult to get a comprehensive overview. This study aims to provide a contemporary and state-of-the-art overview of available applications and effectiveness of EMDR-therapy for patients treated in the medical setting. We performed a systematic literature search of MEDLINE, Web of Science, PsycINFO, and the Cochrane Central Register of Controlled Trials, following the PRISMA guidelines. The final search was run on April 18, 2023. Articles were included if they focused on evaluating the effectiveness of EMDR treatment on adult patients with (1) somatic symptoms, or psychological symptoms related to and combined with somatic symptoms, if patients were (2) treated in a medical setting, and (3) outcomes used to measure the effectiveness of the EMDR intervention were reported. No restrictions were made regarding the outcome measures, the date of publication, nor on the language the articles were written. The 89 studies included varied in terms of risk of bias: the overall appraisal of these studies showed at least moderate to high risks of bias.

Added value of this study

This is the first systematic literature review that evaluated the use and effectiveness of EMDR-therapy for adult patients treated in the medical setting, including hospitals, extramural specialized clinics and private clinics, across various medical domains.

Implications of all the available evidence

EMDR appears to have a beneficial effect on improving psychological and physical symptoms, including anxiety, PTSD, and pain, in adults treated in a medical setting. Most evidence exists for its application in the fields of oncology, pain, and neurology. The average treatment duration was relatively short, which further improves applicability in the medical setting. Future research should aim for randomized controlled studies focusing on the efficacy of EMDR therapy in the medical setting, in which adverse events, and treatment adherence are explicitly mentioned.

Contributors

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Declaration of interests

All authors are employees of the Erasmus Medical Center. The author(s) declare no conflicts of interest.

Data sharing

The manuscript has no associated data.

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This article does not contain any studies with human or animal subjects performed by any of the authors.

Consent to participate

Not applicable.

Consent for publication

Not applicable.

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