

# Review of EMDR Interventions for Individuals With Substance Use Disorder With/Without Comorbid Posttraumatic Stress Disorder

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A large proportion (11%–60%) of people with posttraumatic stress disorder (PTSD) also suffer from substance use disorder (SUD). As the high cooccurrence of PTSD and SUD leads to a worsening of psychopathological severity, development and evaluation of integrated treatments become highly valuable for individuals presenting with both diagnoses. Eye movement desensitization and reprocessing (EMDR) therapy may fit these needs. This article summarized all studies that investigated EMDR treatment for SUD, to clarify whether EMDR might be a useful approach. A comprehensive Title/Abstract/Keyword search was conducted on PsycInfo, PsychArticle, PubMed, and Scopus databases. A total of 135 articles were retrieved, and 8 articles met inclusion/exclusion criteria. One RCT and one case study evaluated trauma-focused EMDR; one clinical RCT, one non-clinical RCT, one cross-over study, and one case study evaluated addiction-focused EMDR; and one quasi-experimental and one multiphase case study evaluated the combination of addiction-focused and trauma-focused EMDR. Results show that EMDR treatment consistently reduces posttraumatic symptoms, but that its effects on SUD symptoms are less evident. Although EMDR should be considered as a promising tool for this population due to its possible potential to improve SUD outcomes, further research is needed to see whether EMDR therapy, either trauma-focused or addiction-focused, is effective for SUD. We conclude with suggestions for future research and clinical practice in this area.

**Keywords:** eye movement desensitization and reprocessing (EMDR); substance use disorder; posttraumatic stress disorder; comorbidity; treatment

**S**ubstance use disorder (SUD) is currently the second most prevalent disorder comorbid with posttraumatic stress disorder (PTSD) after major depressive disorder (Farley, Golding, Young, Mulligan, & Minkoff, 2004). Approximately 89% of individuals seeking treatment for SUD have been exposed to a traumatic event in their life, and a large proportion of them (11%–60%) will meet diagnostic criteria for PTSD (Farley et al., 2004). Therefore, SUD and PTSD frequently co-occur (McCauley, Killeen, Gros, Brady, & Back, 2012).

The high co-occurrence of SUD and PTSD has become more important with the acknowledgment that either of these disorders left untreated will

negatively impact the outcomes of the other disorder (Baschnagel, Coffey, & Rash, 2006; Stewart, Pihl, Conrod, & Dongier, 1998). The prognosis for patients with PTSD is worse for those with a comorbid SUD (Berenz & Coffey, 2012). For example, substance users with co-occurring PTSD report a more impaired social functioning, more chronic physical health problems, more suicide attempts, more legal and violence problems, and more intense cravings for drugs/alcohol (Henslee & Coffey, 2010; Norman, Stein, Dimsdale, & Hoyt, 2008; Ouimette, Goodwin, & Brown, 2006; Tate, Norman, McQuaid, & Brown, 2007). They also report less treatment adherence and less improvement during treatment (Back, Brady, Jaanimagi, & Jackson,

2006; Baschnagel et al., 2006; Ouimette, Brown, & Najavits, 1998; TARRIER & GREGG, 2004; Young, Rosen, & Finney, 2005). Therefore, it becomes crucial to treat traumatic experiences in SUD populations, as they may contribute to the onset and maintenance of the disorder and lead to a worsening of psychopathological severity (Carletto et al., 2018).

Unfortunately, there is not currently a gold standard of care for individuals presenting with both diagnoses (Berenz & Coffey, 2012). Among non-exposure-based psychosocial treatments, Seeking Safety is an evidence-based program specifically designed to help trauma survivors with co-occurring SUD to reestablish basic physical and emotional safety (Najavits, Weiss, Shaw, & Muenz, 1998). However, published studies found limited support for Seeking Safety among individuals with comorbid SUD/PTSD (Berenz & Coffey, 2012). Furthermore, it is not clear whether integrated cognitive-behavioral treatment outperforms SUD treatment alone (Berenz & Coffey, 2012). So far, the most promising outcome data come for exposure-based interventions. They revealed that exposure therapy is rather useful for treating SUD that co-occurs with PTSD (Berenz & Coffey, 2012). However, the effectiveness of treatments incorporating exposure-based components relies heavily on self-control and, by extension, proper executive functioning (Markus & Hornsveld, 2017), and repeated use of drugs or alcohol is associated with structural abnormalities in the brain, particularly in prefrontal structures, especially important for executive control (Crews & Boettiger, 2009). Finally, for most addictions, there are no effective pharmacotherapeutic options (Markus & Hornsveld, 2017). In summary, the value of existing addiction treatments is limited and when they proved effective, they depend too much on self-control strategies, severely damaged in patients with SUD.

According to Markus and Hornsveld (2017), eye movement desensitization and reprocessing (EMDR) therapy (Shapiro, 2001) may fit the needs for interventions in SUD populations because (a) EMDR therapy efficacy is clearly established for treating PTSD (Cusack et al., 2016), (b) it can be safely applied among individuals with SUD to treat comorbid PTSD (Perez-Dandieu & Tapia, 2014; Rougemont-Bücking & Zimmermann, 2012), and (c) modified EMDR procedures that focus on the addiction itself have shown encouraging results (Hase, Schallmayer, & Sack, 2008). In this way, two approaches can be distinguished when considering the use of EMDR in addiction (Markus & Hornsveld, 2017). First, trauma-focused EMDR (TF-EMDR) is the use of standard

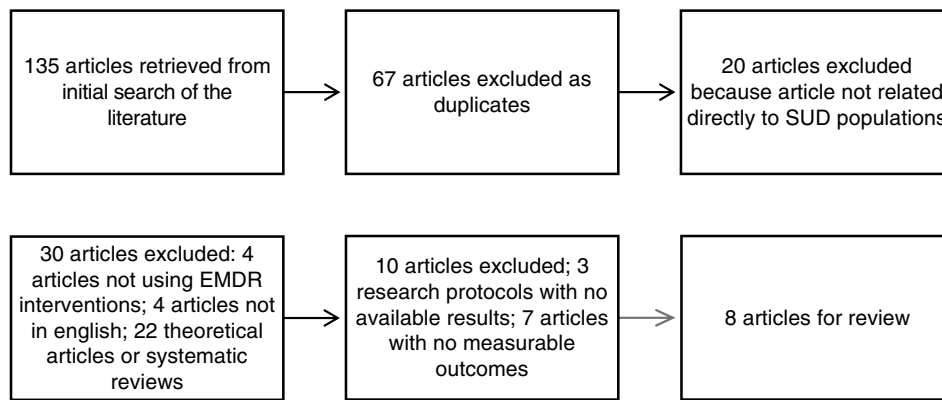
EMDR therapy to reduce addiction severity through the treatment of trauma and comorbid PTSD. Second, addiction-focused EMDR (AF-EMDR) is the use of a modified EMDR-based protocol to target addiction-related memories rather than trauma-related memories. However, it remains unclear whether EMDR (either trauma focused or addiction focused) might be a useful approach for the treatment of SUD. The objective of this article was to summarize all existing trauma-focused and addiction-focused therapies for treating individuals seeking treatment for SUD with or without comorbid PTSD in order to fill this gap. The findings of this review will be of benefit for future clinical practice.

## Method

A Title/Abstract/Keyword search was conducted of the databases: PsycInfo, PsychArticle, PubMed, and Scopus. Search terms were "emdr or eye movement desensitization therapy or eye movement desensitization and reprocessing" AND "substance abuse or substance use or drug abuse or drug use or drug addiction or addiction or dependence or craving." The search was completed on the 17 July 2019. Peer reviewed journal articles were included where TF-EMDR and/or AF-EMDR interventions were used. The search was restricted to studies from January 1989, the year where Francine Shapiro's published her seminal first article (Shapiro, 1989). All age groups were suitable for inclusion. Exclusion criteria included (a) studies that did not use EMDR interventions for treating SUD populations; (b) studies using EMDR interventions for primary populations other than SUD; (c) studies in which no outcome scores were collected; (d) articles not published in English, unless a translation was readily available; and (e) theoretical articles, systematic reviews, meta-analyses, and study protocol articles. Articles were filtered in accordance with the sequence in Figure 1.

## Results

Initial literature search yielded 135 articles, of which 8 met the strict study criteria (Figure 1). The characteristics and main findings of the selected studies are summarized in Table 1. Although 67 of the excluded articles were duplicates, 60 other articles did not meet our criteria. For example, the population in Brown et al. was a forensic sample (Brown, Gilman, Goodman, Adler-Tapia, & Freng, 2015). The clinical case study in Cox and Howard was carried on a patient



**FIGURE 1.** Flow chart of the review process showing how the initial 135 articles were reduced to 8.

with sexual addiction (Cox & Howard, 2007). The participants in the Kullack and Laugharne study were seeking treatment for PTSD, not SUD (Kullack & Laugharne, 2016). No measurable outcomes were provided in a number of articles (Abel & O'Brien, 2010; Cecero & Carroll, 2000; Marich, 2009, 2010; Shapiro, 1994; Zweben & Yeary, 2006).

Of the eight included articles, two were TF-EMDR studies (Perez-Dandieu & Tapia, 2014; Rougemont-Bücking & Zimmermann, 2012), four AF-EMDR studies (Hase et al., 2008; Littel, Van den Hout, & Engelhard, 2016; Markus, De Weert-van Oene, Woud, Becker, & DeJong, 2016; Qurishi, Markus, Habra, & De Jong, 2017), and two studies combined both approaches (Carletto et al., 2018; Tapia et al., 2018). Three were RCTs (Hase et al., 2008; Markus et al., 2016; Perez-Dandieu & Tapia, 2014), two were case report studies (Qurishi et al., 2017; Rougemont-Bücking & Zimmermann, 2012), one was a quasi-experimental study (Carletto et al., 2018), one was a crossed design study (Littel et al., 2016), and one was a pre-post multiphase case study (Tapia et al., 2018).

Sample sizes for the included studies ranged from 1 to 50. Three studies were carried on female participants only (Perez-Dandieu & Tapia, 2014; Qurishi et al., 2017; Tapia et al., 2018). Two studies were conducted among a nonclinical population (students with daily smoking) (Littel et al., 2016; Markus et al., 2016). The others were conducted among patients with SUD suffering from alcohol substance use (Hase et al., 2008) or drug substance use (Carletto et al., 2018; Qurishi et al., 2017; Rougemont-Bücking & Zimmermann, 2012) or both (Perez-Dandieu & Tapia, 2014; Tapia et al., 2018). Two studies included patients with SUD and comorbid PTSD (Perez-Dandieu & Tapia, 2014; Tapia et al., 2018) and one with comorbid complex PTSD (Rougemont-Bücking & Zimmermann, 2012).

## Trauma-Focused EMDR

TF-EMDR has only been evaluated with one RCT (Perez-Dandieu & Tapia, 2014). The authors examined whether a standard EMDR protocol (eight sessions) integrated with treatment as usual (TAU) was effective for treating co-occurring SUD-PTSD among six alcohol- and/or drug-addicted women receiving social medical care for addiction problems. Results were related to greater improvements in PTSD outcomes in the TAU + EMDR condition compared with TAU only. It is also worth noting that anxious and depressive symptoms were significantly better in this group. However, EMDR treatment was not associated with a significant decrease in alcohol and/or drug use.

The other TF-EMDR intervention presented in Table 1 is a case report study (Rougemont-Bücking & Zimmermann, 2012). This study examined the use of EMDR with two patients with SUD and comorbid complex PTSD who continued to use illicit drugs during treatment. The outcomes did not show any specific benefits for EMDR-based treatment. However, this study showed that TF-EMDR is feasible despite ongoing substance use among SUD patients, as the patients did not report increased craving and substance use over time. Therefore, as ongoing substance use is viewed by many therapists as an obstacle to psychotherapy, this study advocates for the possibility of considering psychotherapy among patients who still actively use drugs as an acceptable therapeutic option.

## Addiction-Focused EMDR

AF-EMDR has been investigated in a within-subjects crossed design, a case study, and two RCTs. The within-subjects crossed design investigated the effects of eye movements (EMs) on vividness of recent smoking-related memories and cigarette craving in

**TABLE 1. Summary of Characteristics and Main Results of the 8 Reviewed Articles on EMDR Interventions in the Treatment of SUD**

Study	Design	Sample Size	Addiction Type	Trauma Type	Number of EMDR Sessions	Main Findings	Comments
<b>Trauma-Focused (TF) interventions</b>							
Perez-Dandieu and Tapia (2014)	RCT Pilot TAU-only versus TAU++ EMDR	12	Alcohol and/or drug dependency	PTSD Sexual abuse, physical abuse, physical threatening	8 EMDR sessions	Add-on EMDR had greater effects on PTSD symptoms, depressive symptoms and anxiety than TAU-only; add-on EMDR had no effect on SUD symptoms	The only randomized study in this field. Only women; TF-EMDR was not effective on SUD symptoms
Rougemont-Bücking and Zimmermann (2012)	Case reports	2	Drugs (opiates and benzodiazepines)	Complex PTSD Torture/captivity Emotional abuse	4-5 EMDR sessions	Trauma processing did not increase (but neither decrease) craving and substance use over time	EMDR therapy was challenging but feasible, despite ongoing substance use among SUD patients
<b>Addiction-Focused (AF) interventions</b>							
Qurishi et al. (2017)	Case study	1	GHB and amphetamine	Emotional neglect	7 subset sessions of PEIA	Patient remained abstinent at least 6 months after intervention; lower craving intensity at the end of the treatment	Non-PTSD addicted patient; other treatments during EMDR intervention
Littel et al. (2016)	Experimental Recall + Eyes Movements (EM) versus eyes stationary	50	Tobacco	No data on trauma history or PTSD	6 sets of EM	Image vividness of recent smoking-related memories and craving were attenuated by recall + EM. Recall + EM tend to decrease the emotional intensity of smoking related images compared to eyes stationary	Participants were students without SUD diagnosis; Eye movements were used instead of EMDR therapy
Markus et al. (2016)	RCT Recall + Eye Movements (EM) versus fixed gaze	47	Tobacco	No data on trauma history or PTSD	12 sets of 30 seconds of EM	Reduction of craving intensity and vividness of targeted memories; effects lost after 1-week follow-up	Participants without SUD diagnosis; Eye movements were used instead of EMDR therapy

(Continued)

**TABLE 1. Summary of Characteristics and Main Results of the 8 Reviewed Articles on EMDR Interventions in the Treatment of SUD (Continued)**

Study	Design	Sample Size	Addiction Type	Trauma Type	Number of EMDR Sessions	Main Findings	Comments
Hase et al. (2008)	RCT TAU versus TAU+EMDR	34	Alcohol	Some patients with PTSD	2 EMDR sessions (Cravex)	At follow-up (1 month), patients allocated to TAU + EMDR had less craving, relapse and depressive symptoms than patients in TAU group.	The only RCT in this field; high study dropout; no assessment of substance use severity before and after intervention
<b>Trauma-Focused and Addiction-Focused interventions</b>							
Carletto et al. (2018)	Quasi-experimental TAU vs. TAU + EMDR	40	Drugs	No data on trauma history or PTSD	24 weekly TF/AF-EMDR sessions	Add-on EMDR had greater effects on PTSD symptoms than TAU-only; add-on EMDR reduced dissociative symptoms, psychiatrics symptoms and anxiety	No assessment of substance use severity or craving before and after intervention
Tapia et al. (2018)	Pre-post multi-phase case study	15	Alcohol and/or drug dependency	PTSD, sexual abuse, physical abuse, physical threatening, emotional abuse	8 TF-EMDR sessions + 8 AF-EMDR sessions	Schema therapy with TF-EMDR decreased PTSD symptoms and the number of subactivated early maladaptive schemas; AF-EMDR decreased substance use severity and depressive symptoms but had no effect on craving	Only women; no control group; no counterbalance protocol. The effects of the AF-EMDR intervention might be caused by the first TF-intervention

*Note.* AF = addiction-focused; EM = eye movement; PEIA = palette of EMDR interventions in addiction; PTSD = posttraumatic stress disorder; RCT = randomized controlled trials; SUD = substance use disorder; TAU = treatment as usual; TF = trauma-focused; GHB = Gamma-hydroxybutyric acid.

students who were daily smokers (Littel et al., 2016). Results indicated that brief sets of EM during the recall of substance-related images can (a) attenuate the craving that is specifically evoked by these images, (b) attenuate substance image vividness, and (c) decrease image emotionality compared to a control condition with eyes stationary. EM seemed to be particularly promising in the reduction of both intensity of substance-related imagery and craving. However, these effects were measured at the time of the intervention, and no follow-up was conducted. Markus et al. (2016) also investigated the effects of EM on craving, vividness of target memories, and smoking behavior in daily smokers. The EM group showed significant immediate reductions of craving and vividness of targeted memories. However, these effects were lost during a 1-week follow-up period. Furthermore, the added value of EM in the working memory taxation benefits on craving is not clear. Overall, these encouraging results need to be treated cautiously, as we do not know whether the effects of EM can be generalized to clinical populations, who are more severely affected and who are often highly medicated, with a long history of addiction, relapse, and multiple traumas.

For patients with SUD, there has been only one RCT and one case study testing AF-EMDR. The RCT was based on the craving extinguished (CravEx) approach (Hase et al., 2008). This approach focuses on the reprocessing and the desensitization of memory representations of relapse and intense craving also called “addiction memory” (Boening, 2001). In this study, 34 chronic alcohol-dependent patients were randomly assigned to one of two treatment conditions: TAU only or TAU plus two 1-hour sessions of EMDR. Results showed significantly less craving and lower relapse rates in the TAU + EMDR condition compared with TAU only. These promising findings need to be reproduced in order to determine whether EMDR might be a useful approach for the treatment of SUD. The case study was based on a subset of the the palette of EMDR interventions in addiction (PEIA) (Markus & Hornsveld, 2017). The study showed that after 7 weekly sessions, a 23-year-old woman with a long history of amphetamine and GHB dependency maintained abstinence after 6 months. This interesting result needs to be treated cautiously, as in this study, EMDR was used in a strictly addiction-focused sense because of the non-PTSD status of the patient, which is rarely a feature of such a particularly challenging population (McCauley et al., 2012).

## Combined TF-EMDR and AF-EMDR

Of course, given the clear association between SUD and PTSD (McCauley et al., 2012), the classic TF-EMDR protocol (Shapiro, 2001) and existing AF-EMDR protocols (Hase et al., 2008; Knipe, 2010; Miller, 2010; Popky, 2010) can be integrated and combined. A recent non-randomized, quasi-experimental study investigated this approach for 40 patients with a diagnosis of SUD (Carletto et al., 2018). Results showed that the approach reduced posttraumatic and dissociative symptoms, anxiety, and overall psychopathology levels for the EMDR group, whereas the TAU group showed a significant reduction only in posttraumatic symptoms. Even though these preliminary results are promising, there was no evidence of any effects on substance use because no data on this variable were collected in the study. However, it can be reasonably expected that decreasing posttraumatic and stress-related symptoms of patients with SUD might positively impact substance use severity.

Another recent multiple-phase case study provided eight sessions of schema therapy combined with TF-EMDR followed by eight sessions of AF-EMDR for 15 women with SUD/PTSD comorbidity (Tapia et al., 2018). There was a significant decrease in PTSD symptoms following TF-EMDR and a decrease in addiction severity following AF-EMDR (Tapia et al., 2018). These results might suggest that reprocessing traumatic memories was more efficient for treating PTSD than addiction symptoms, while reprocessing addiction memories was more efficient for treating addiction than PTSD symptoms. It may well also be that the main effect of trauma therapy on addiction is indirect, in that it enhances the feasibility and effectiveness of subsequent addiction treatment. Unfortunately, the lack of control group and counterbalance protocol in this study does not allow conclusions on this matter. Nevertheless, this study demonstrated that initially addressing trauma-related issues did not harm subsequent addiction treatment, and there is the possibility that it might even improve it.

## Discussion

### Recommendations for Future Research

Clearly, further research is needed to see whether EMDR therapy, either trauma-focused or addiction-focused, is effective for SUD. In either way, future studies should not be satisfied with simple within-group improvement on either SUD or PTSD

symptoms and should strive to outperform a control condition (Berenz & Coffey, 2012). Particularly, given that there are only two clinical RCTs over a total of 135 studies, more RCTs are needed to investigate the effectiveness of EMDR interventions in SUD. However, three currently underway large RCTs should provide evidence of whether EMDR therapy is effective in reducing addiction-related symptoms (Markus, De Weert-van Oene, Becker, & DeJong, 2015; Schafer et al., 2017; Valiente-Gómez et al., 2019). According to Berenz and Coffey (2012), before attempting to develop new interventions, it would be a far better approach to test whether established PTSD treatments are efficient among patients suffering from co-occurring SUD-PTSD. If well-designed clinical trials do not support the efficacy of established PTSD treatment, then the development of new interventions for co-occurring PTSD-SUD would be warranted. In this way, trauma-focused EMDR therapy should be the priority of future studies in this area. In individuals with SUD only, a modified EMDR protocol focused on addiction memory deserves attention, since several authors advocate for a specific addiction memory network as the genesis and maintenance of addiction disorders (Torregrossa, Corlett, & Taylor, 2011). Modified EMDR treatment, by reprocessing previously acquired addiction-related memories, may reduce involuntary craving on subsequent retrieval activation (Solomon & Shapiro, 2008). More experimental studies investigating the effects of EM on substance-related memories (Littel et al., 2016; Markus et al., 2016) are needed to better understand the underlying mechanism. In this way, EMDR could be an interesting psychotherapeutic tool for this population due to its potential to improve SUD outcomes.

### Recommendations for Clinical Practice and Training Implications

From a clinical perspective, so far, EMDR has been shown to be successful and feasible within SUD-PTSD populations for amelioration of trauma and traumatic sequelae (Carletto et al., 2018; Hase et al., 2008; Perez-Dandieu & Tapia, 2014; Rougemont-Bücking & Zimmermann, 2012; Tapia et al., 2018). Furthermore, although many substance-abuse therapists believe a client should first reach abstinence before engaging in trauma work, most experts in the field now recognize that decrease in PTSD symptoms can occur without abstinence (Markus & Hornsveld, 2017; Rougemont-Bücking & Zimmermann, 2012). Therefore, even if so far, there is little evidence that treating PTSD symptoms in substance-dependent

patient with EMDR may positively impact substance-related symptoms, addressing trauma-related negative affects has to be considered when treating individuals with co-occurring SUD and PTSD (McGovern et al., 2009; Rougemont-Bücking & Zimmermann, 2012).

In line with this idea, while most mental health-care programs do not offer trauma-oriented therapies for patients with SUD (Valiente-Gómez et al., 2019), there is a need to advocate for EMDR as a primary therapy or add-on treatment and particularly within SUD-PTSD populations. According to some authors, the temporal order of diagnostic onset may impact both symptom presentation and treatment outcomes (Bountress, Badour, Flanagan, Gilmore, & Back, 2018). However, a recent study based on a COPE treatment intervention (integrated prolonged-exposure therapy for PTSD with cognitive-behavioral relapse prevention skills for SUD) revealed no effect of order of onset on SUD outcomes (Bountress et al., 2018).

Nevertheless, the question remains of where to begin EMDR treatment in patients with comorbid PTSD and SUD. According to some authors, in patients for whom substance use is part of their emotional coping strategies, a better choice would be to treat the traumatic memories in the first place (Rougemont-Bücking & Zimmermann, 2012). Persisting compulsive drug craving might be addressed by specific EMDR-protocols at a later phase of treatment. This idea and our current observation seem to corroborate the initial recommendation of Shapiro, who also suggested that for trauma survivors with co-occurring SUD, treatment plans should first take into account the disturbing memories (Shapiro, Vogelmann-Sine, & Sine, 1994). The author hopes that the findings of this brief narrative review will be of benefit for future clinical practice.

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