ARTICLES

EMDR Protocol for Recent Critical Incidents: A Randomized Controlled Trial in a Technological Disaster Context

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This research evaluated the effectiveness of the Eye Movement Desensitization and Reprocessing (EMDR) Protocol for Recent Critical Incidents (EMDR-PRECI) in reducing posttraumatic stress symptoms related to the explosion in an explosives manufacturing factory north of Mexico City that killed 7 employees. The EMDR-PRECI was administered on 2 consecutive days to 25 survivors who had posttraumatic stress symptoms related to the critical incident. Participants' mean score on the Short PTSD Rating Interview (SPRINT) was 22, well above the clinical cutoff of 14. They were randomly assigned to immediate and waitlist/delayed treatment conditions and therapy was provided within 15 days of the explosion. Results showed significant main effects for the condition factor, $F(1, 80) = 67.04$, $p < .000$. SPRINT scores were significantly different across time showing the effects of the EMDR therapy through time, $F(3, 80) = 150.69$, $p < .000$. There was also a significant interaction effect, condition by time, $F(2, 80) = 55.45$, $p < .001$. There were significant differences between the two treatment conditions at Time 2 (post-immediate treatment vs. post-waitlist/delayed), $t(11) = -10.08$, $p < .000$. Treatment effects were maintained at 90-day follow-up. Results also showed an overall subjective improvement in the participants. This randomized controlled trial provides evidence for the efficacy of EMDR-PRECI in reducing posttraumatic stress symptoms after a technological disaster.

Keywords: Eye Movement Desensitization and Reprocessing (EMDR) Protocol for Recent Critical Incidents (EMDR-PRECI); technological disaster; early EMDR therapy intervention; posttraumatic stress disorder (PTSD); industrial explosion

At 9:45 am on February 20, 2015, a terrible explosion in an explosives manufacturing factory located north of Mexico City hit the 32 workers by surprise. The explosion impact, caused by a human error, was felt more than 2 kilometers away. Seven workers (four men and three women) between 22 and 35 years old were killed. The 25 survivors escaped from the rubble confused and frightened. After medical attention to the physical injuries, the company requested assistance from the Mexican Association for Mental Health Support in Crisis (AMAMECRISIS).

Technological Disasters

A technological disaster is the result of a failure of human-made products (Weisaeth, 1994). In a technological disaster, a human action or a man-made product results in death, injury, and destruction. Examples of technological disasters are industrial/factory explosions, nuclear plant accidents, toxic waste, air crashes, train derailments and collisions, passenger ship and other maritime catastrophes, large-scale road accidents, mining disasters, oil blowout, and so forth.

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Many classic technological disasters are industrial and severely affect company employees. In a longitudinal follow-up 2 years after the industrial AZF disaster (explosion in a petrochemical factory in Toulouse, France, in 2001 that caused 30 deaths and injured 2,242 people), researchers evaluated a cohort of 3,006 people. They found that the prevalence of psychological distress was 47%, establishing a link between the technological-industrial disaster and psychological distress (Cohidon et al., 2009). In another example, Meewisse, Olff, Kebler, Kitchiner, and Gerson (2011) reported that at 2 years posttechnological disaster (huge explosion in a central storage facility of fireworks factory in the Netherlands), 48.3% of survivors fulfilled the criteria for a mental health disorder within the previous 12 months. The most common disorders were posttraumatic stress disorder (PTSD; 21.8%), specific phobia (21.5%), and depression (16.1%). High 12-month comorbidity rates among these three disorders were found, and more than half of the survivors suffered from two or more coexisting disorders. Some technological disasters, such as Chernobyl or incidents of toxic waste, are not time-limited events and do not have a posttrauma safety period. These latter disasters present a sequence of events that continues to unfold over the years, creating a continuum of stressful events that extends until the present moment.

EMDR Therapy

The World Health Organization (2013) and numerous international mental health review publications, such as the Cochrane Review, recommend eye movement desensitization and reprocessing (EMDR) therapy for treatment of PTSD in children, adolescents, and adults (Bisson, Roberts, Andrew, Cooper, & Lewis, 2013). This therapy, developed by Dr. Francine Shapiro (F. Shapiro, 2001), is a comprehensive approach to treatment of trauma, adverse life experiences, or psychological stressors.

Early EMDR Therapy Intervention

Early psychological interventions is the term used by Roberts, Kitchiner, Kenardy, and Bisson (2010) for interventions that begin within the first 3 months after a traumatic event with the primary aim of preventing PTSD or ongoing distress in those presenting with traumatic stress symptoms, or with acute stress disorder (ASD), or who are at risk for PTSD or other disorders. Early EMDR therapy intervention (EEI) has a natural place in the crisis intervention and disaster mental health continuum of care context and may be key to early psychological interventions as a brief treatment modality (Jarero, Artigas, & Luber, 2011). The clinical experience and work in the field with EEI has been extensive (Maxfield, 2008). There is a growing body of research supporting the use of modified EMDR therapy protocols to treat PTSD symptoms in both group and individual formats following natural and man-made disasters (e.g., Buydens, Wilensky, & Hensley, 2014; Colelli & Patterson, 2008; Natha & Daiches, 2014). The primary reason for modifying the EMDR protocol is that memory consolidation appears to change in the weeks and months following a critical incident (F. Shapiro, 2001). See E. Shapiro (2012) and E. Shapiro and Laub (2015) for a review of early psychological interventions following traumatic events in general and the place of EEI in particular and Luber (2014) for a review of early mental health interventions for man-made and natural disasters with EMDR therapy.

Previously, we have argued that acute trauma situations are related not only to a time frame (days, weeks, or months) but also to a posttrauma safety period as well (Jarero & Uribe, 2011, 2012). Our hypothesis is that the continuum of stressful events with similar emotions and somatic, sensorial, and cognitive information, does not give the state-dependent traumatic memory sufficient time to consolidate into an integrated whole. Thus, the memory networks remain in a permanent excitatory state, expanding with each subsequent stressful event to the original critical incident, analogous to ripples from a rock falling in the middle of a lake. The risk of PTSD and comorbid disorders would therefore grow with the number of exposures. For example, the case of a patient who received a cancer diagnosis 18 months ago could be conceptualized as an acute trauma situation because after hearing the cancer diagnosis (original critical incident—the pebble thrown into a pond), there was no posttrauma safety period. Instead, the client experienced a continuum of stressful events (the ripple effect) such as physically grueling investigations and aggressive treatments, side effects of treatments, surgery and organ mutilation, bodily dysfunction, and so forth. Thus, the patient's memory network remains in a permanent excitatory state, expanding with each subsequent stressful event in this continuum that extends until the present moment.

EMDR Protocol for Recent Critical Incidents

The Eye Movement Desensitization and Reprocessing (EMDR) Protocol for Recent Critical Incidents (EMDR-PRECI) is a modification of F. Shapiro's

(2001) Recent Traumatic Events Protocol provided in an individual treatment format to clients suffering from ongoing trauma. We developed it in the field to treat critical incidents where related stressful events continue for an extended time and where there is no posttrauma safety period for memory consolidation.

EMDR-PRECI uses an eight-phased protocol. Phases 1 and 2 are the history taking and preparation phases. In Phase 3, disturbing memory fragments are assessed with the client identifying the most disturbing image, related negative cognition (NC), emotion, ratings of subjective units of disturbance (SUD), and body sensation location but no positive cognition (PC) or rating of validity of positive cognition (VOC). During Phase 4 (desensitization), the client focuses on each memory fragment, while simultaneously engaging in dual attention stimulation using eye movements (EM) as a first choice and the butterfly hug (BH; Artigas & Jarero, 2014) as an alternative bilateral stimulation (BLS). Each memory fragment is processed in turn, using the free associative processing of the standard EMDR desensitization phase. When all fragments have been processed with Phase 4, and the client identifies no further disturbance, Phase 5 is applied to the entire extended event with a PC developed for the entire incident. Installation of PC does not use frequent checking of VOC but full reprocessing doing BLS while information is moving. A supplemental step is conducted in this phase to review the whole sequence holding the PC. Phase 6 uses standard EMDR procedures. Phase 7 uses our (Jarero & Artigas, 2014) postdisaster self-soothing strategies, and Phase 8 uses standard procedures. See Jarero et al. (2011) and Jarero and Artigas (2014) for further details of our protocol.

Previous EMDR-PRECI Studies

After a 7.2-Magnitude Earthquake. EMDR-PRECI treatment was provided subsequent to a 7.2-magnitude earthquake in North Baja California, Mexico, according to continuum of care principles. One session of EMDR-PRECI (Jarero et al., 2011; Jarero & Uribe, 2011, 2012) produced significant improvement on symptoms of posttraumatic stress for both, the immediate treatment ($N = 9$) and waitlist/delayed treatment conditions ($N = 9$), with results maintained at a 12-week follow-up, although frequent frightening aftershocks continued to occur.

After a Human Massacre. After a human massacre in the Mexican state of Durango, forensic personnel had the horrific task of recovering 258 mutilated bodies from clandestine graves. During the months-long process, they were continually exposed to horrific emotional stressors, including ongoing threats to their own safety. A single individual EMDR session was provided to 32 workers. Results showed significant improvement for both immediate treatment ($N = 18$) and waitlist/delayed treatment ($N = 14$) conditions (Jarero & Uribe, 2011, 2012), on the Impact of Event Scale (IES) and Short PTSD Rating Interview (SPRINT; Connor & Davidson, 2001; Vaishnavi, Payne, Connor, & Davidson, 2006).

Method

The purpose of our research is to evaluate the effectiveness of the EMDR-PRECI to reduce the PTSD symptoms related to the explosion in an explosives factory north of Mexico City that killed 7 employees using a waitlist/delayed treatment control group design with random assignment to conditions. The research protocol was reviewed and approved by the Latin American & Caribbean Foundation for Psychological Trauma Research review board to ensure that the research quality of this study partially fulfilled the Revised Gold Standard scale (Maxfield & Hyer, 2002) items. The Gold Standard criteria are 1 = clearly defined target symptoms, 2 = reliable and valid measures, 3 = use of blind independent evaluators, 4 = assessor reliability, 5 = manualized treatment, 6 = random assignment, 7 = treatment fidelity, 8 = no confounded conditions, 9 = use of multimodal measures, and 10 = length of treatment for participants with single trauma (civilians). The study fully met Criteria 2, 4, 5, 6, 7, and 8; partially met Criteria 1 and 3; and did not meet Criteria 9 and 10. All participants gave written informed consent.

Participants

This randomized controlled trial study was conducted in the field in a safe area inside the factory facilities. The sample comprises 25 explosion survivors. Participants' age ranged from 23 to 56 years old ($M = 38.56$ years). There were 13 participants (11 women and 2 men) in the immediate treatment condition group and 12 participants (10 women and 2 men) in the waitlist/delayed treatment condition group. Inclusion criteria were (a) 18 years old or older, (b) explosion survivor, (c) with posttraumatic stress symptoms related to the critical incident, (d) had not received or was not receiving specialized trauma therapy, and (e) had not received or was not receiving drug therapy for the posttraumatic stress symptoms. Exclusion criteria were (a) ongoing suicidal or homicidal ideation, (b) diagnosis of psychotic or bipolar

disorder, (c) organic mental disorder, (d) substance abuse, (e) significant cognitive impairment. All 25 survivors met inclusion criteria and participated in the study. Participation was voluntary, and there were no dropouts throughout the study period.

Measures

Short PTSD Rating Interview. The SPRINT (Connor & Davidson, 2001; Vaishnavi et al., 2006) is an 8-item interview or self-rating questionnaire with solid psychometric properties that can serve as a reliable, valid, and homogeneous measurement of PTSD illness severity and global improvement as well as a measure of somatic distress; stress coping; and work, family, and social impairment. Each item is rated on a 5-point scale: 0 (*not at all*), 1 (*a little bit*), 2 (*moderately*), 3 (*quite a lot*), and 4 (*very much*). Scores between 18 and 32 correspond to marked or severe PTSD symptoms, between 11 and 17 to moderate symptoms, between 7 and 10 to mild symptoms, and scores of 6 or less indicate either minimal or no symptoms. The SPRINT also contains two additional items to measure global improvement according to percentage of change and severity rating. SPRINT performs similarly to the Clinician-Administered PTSD Scale (CAPS) in the assessment of PTSD symptoms clusters and total scores. It can be used as a diagnostic instrument (Vaishnavi et al., 2006). It was found that in the SPRINT, a cutoff score of 14 or more carried out a 95% sensitivity to detect PTSD and 96% specificity for ruling out the diagnosis, with an overall accuracy of correct assignment being 96% (Connor & Davidson, 2001).

Procedure

The research was conducted in six stages:

Stage 1. The recruitment of participants took place 10 days after the explosion (February 20, 2015), from March 2 to March 10, 2015. During this time, two qualified, not blind to the research protocol, independent assessors explained the purpose of the research, as well as inclusion and exclusion criteria, obtained the informed consents, collected the clinical history of each participant, and applied the SPRINT as a baseline assessment for all participants (Time 1; Figure 1). During this phase, participants were divided randomly into two groups (immediate treatment condition and waitlist/delayed treatment condition) and randomly assigned to the three therapists.

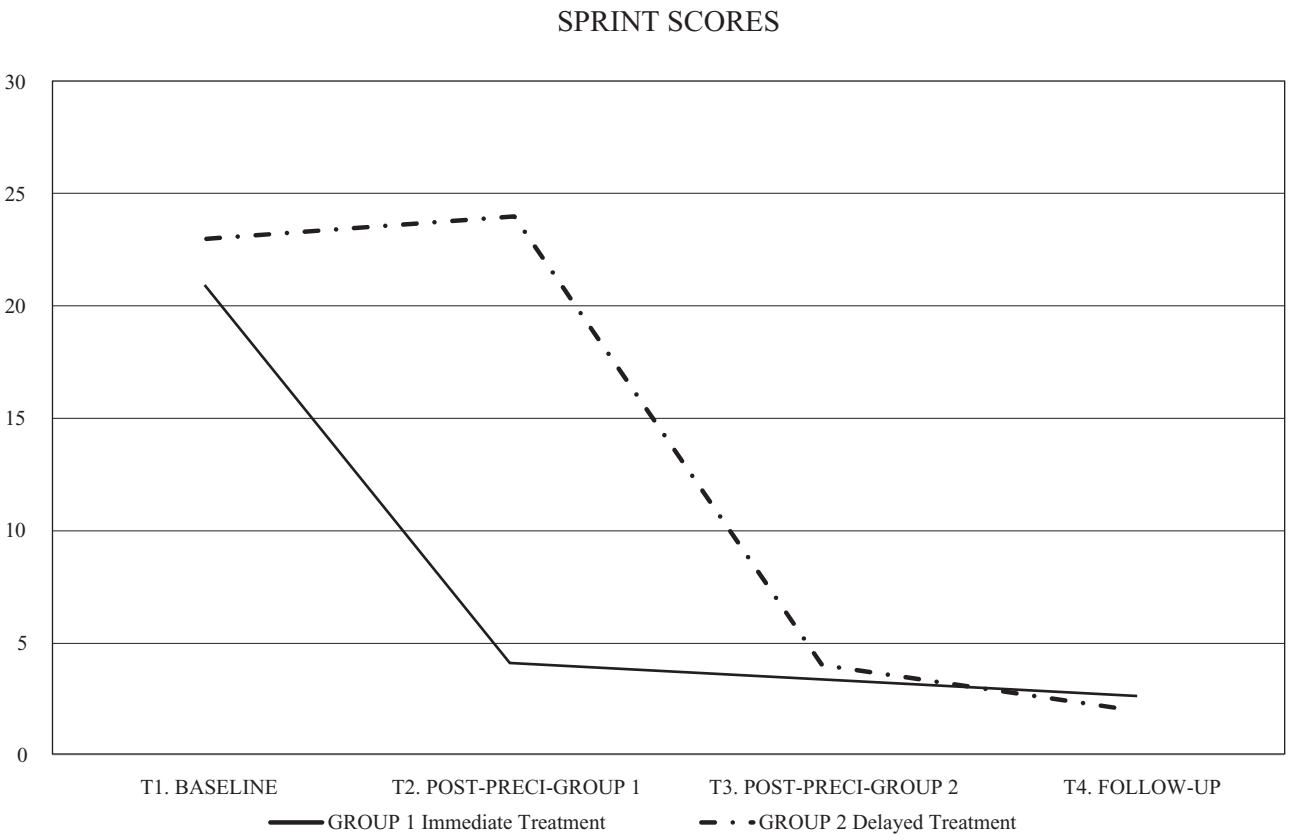

FIGURE 1. Short PTSD Rating Interview (SPRINT) means by time and group.

Stage 2. During March 17 and 18, 2015, the EMDR-PRECI was administered on two occasions to the 13 participants in the immediate treatment condition.

Stage 3. On March 25, 2015, two independent assessors applied the SPRINT to participants in both groups (Time 2).

Stage 4. During March 26 and 27, 2015, the EMDR-PRECI was administered on two occasions to the 12 participants in the waitlist/delayed treatment condition.

Stage 5. On April 3, 2015, two independent assessors applied the SPRINT only to the waitlist/delayed treatment condition participants (Time 3) for post-treatment assessment.

Stage 6. On June 5 and 6, 2015, follow-up assessment for all participants was conducted 90 days after the baseline assessment (Time 4) by independent, not blind to treatment, assessors.

Treatment

In this study, the EMDR-PRECI was selected for the treatment based in the continuum of stressful events the participants were currently living (e.g., physical injuries, the danger of another explosion, the fear to lose their jobs, the grieving for the loss of their friends). The protocol was administered to two groups of participants (immediate treatment condition, $N = 13$ and waitlist/delayed treatment condition, $N = 12$) on two consecutive days. Treatment was provided in individual sessions that were approximately 60 minutes in length. The administration of the EMDR-PRECI was provided by three EMDR Institute and EMDR-Ibero-America trainers. Treatment fidelity was fulfilled by strict observance to all steps of the scripted EMDR-PRECI. To ensure that participants in the waitlist/delayed treatment condition were not in severe crisis, one short supportive telephone call was made to each participant by the clinicians during the waitlist period.

Clinical Treatment Strategies. In all contact with participants, clinicians in this study strived to develop rapport, facilitate bonding, and establish a therapeutic alliance. Their goal was to create an atmosphere of safety, respect, and trust with the clients, projecting a stable and confident presence based on honoring and trusting the process. During all the interventions, therapists maintained a "floating attention" in which they moved their attention/concentration back and forth between self and client, scanning their personal somatic and affect reactions, to be aware of any adverse reaction to the client material, stay present, and avoid unconscious maladaptive responses toward the client.

During the reprocessing phases (4–6), therapist verbal intervention was kept to the minimum only necessary for the continuity of information reprocessing. Clinicians did not use strategies to confine associations during the reprocessing phases because EMDR therapy is an inherently client-centered approach that emphasizes the client's innate capacity to heal through the activation of a physiological adaptive information processing mechanism that requires "minimal clinician intrusion" (F. Shapiro, 2001, p. 18).

To control the intensity of processing, keeping the clients in their window of tolerance and avoiding overwhelming sensory/emotional stimulation, clinicians asked the clients to keep their eyes open during the entire reprocessing time, adjusted the EM length of sets and speed to the client's needs, and used the BH as an alternative BLS. It is thought that the control obtained by the client over his or her stimulation with the BH may be an empowering factor that aids his or her retention of a sense of safety while processing traumatic memories (Artigas & Jarero, 2014). Clinical observations during EMDR-PRECI reprocessing phases (4–6) using the full power of standard EMDR free associative processing showed that adjusting the EM length of sets and speed to the client's necessities or using the BH as an alternative BLS resulted in a nonstuck and a rapid progression of traumatic information processing.

Statistical Analysis

The data were analyzed using factorial analysis of variance (ANOVA), with the effects of the EMDR-PRECI evaluated with the SPRINT as dependent variable and group (two groups of patients: immediate treatment group and waitlist/delayed treatment group) and time (four time points) as independent variables. Post hoc analyses using the Scheffe post hoc criterion for significance were carried out.

Results

Results are presented in two sections. The first section describes the qualitative and clinical information. The second section presents the statistical data analysis.

Pretreatment Phenomenological Data

Symptoms. During the phase of history taking (Phase 1), participants described disturbances associated with the following symptoms:

Flashbacks and Intrusive Images. Survivors reported disturbing intrusive images related to dead bodies such as "I have disturbing images of one of my dead friend keep coming at all times . . . he had a dreadful death, the image of his intestines coming out is driving me

crazy"; "Every day I can see the unrecognizable face of my friend . . ."; "I took the pulse of one of them, he was already dead, it reminded me of when I saw my 6-year-old little boy dying and . . . I couldn't do anything to save him" (her little boy had passed away after having choked on candy, 5 years before).

Body Sensations. Others survivors had memories about body sensations they experienced at that moment: "The ground was moving so badly, it was horrible, I cannot lose the sensation . . ." or "Pieces of the roof, fell on me, and the noise . . ., that sound keeps coming all the time . . ." A woman diagnosed with a neck sprain said, "I keep on remembering when the blast pushed me suddenly some 3 meters from my worktable . . ."

Flash-Forward. For some of them, the worst is yet to come. Even when they know working with these kinds or materials can be dangerous, an incident like this is a reminder of the fragility of the life: "I'm going to die, my children will become orphans." Catastrophic thinking's as "I have the feeling that something is going to happen to me or my family, something horrible."

Note: In some parts of Mexico, there are beliefs concerning the ways people die. For example, in traumatic accidents, such as this blast, the souls of the dead may feel lost or confused because of the suddenness of the event and may come from the afterworld seeking for help: "I'm afraid to walk into my working area because of the dead . . . I'm afraid the dead may appear."

Cognitive Symptoms

Repetitive Thoughts. Frightening thoughts about the possibility of another explosion: "This is a time bomb; it's just a matter of time." In addition, being aware that one's life depends on others: "I love my job, I do it well, but what if others don't . . ., we all could die"; "This could happen again, our lives are in other people's hands."

Guilt. Some of the coworkers noticed that prior to the explosion, a coworker had not been following the proper procedures: "If we had warned them, maybe it wouldn't have happened"; "It fills me with guilt that I didn't dare to say something . . ., I knew they were doing something wrong! If I had said something they would still be alive . . ." Feelings of inadequacy and insecurity such as "If I had known more . . ., I became a first responder to help, I'm going to give it up"; "Maybe it was my fault, maybe I did something wrong"; "I could have done something to prevent it . . . this is a nightmare, If I made a mistake it could be fatal!" "I think most of the time: What can I do to avoid something like this? . . . Everything is my responsibility, it could have happened to me."

Sense of Purpose in Life Was Challenged in Some Other Cases. Thoughts such as "What is the point in going on . . ., life is meaningless"; "I don't know when I'll overcome this . . . ."; "If I cannot overcome this, I won't be able to keep my job . . ., my father told me, 'You will never get over this.'"

Dead Wishes. "I don't know why it didn't happen to me, I would no longer have problems . . ."

Peritraumatic Dissociation Symptoms. "I felt tears streaming down my cheeks, but I really didn't feel anything. When I got home, I had to look at myself in the mirror and ask, 'Am I dead . . .?' I don't remember anything, but the moment of the explosion, after is like as if someone had teleported me."

Emotional Symptoms. Fear, anger, guilt, sorrow, anguish, anxiety, sadness, dismay, remorse, weakness, uncertainty, helplessness, expressed in words such as "I feel myself forsaken"; "Sometimes I think I'm weak"; "I get mad when people laugh"; "I'm so afraid I think I'm going to die"; "What bothers me the most is the sadness and I just want to cry, all the time."

Difficulty Expressing Feelings. "I have been feeling very sad, although I cannot cry."

Physical Symptoms. Sleeping problems, cramps in the body, headaches, mouth herpes, exhaustion, fatigue, tension, stress, profuse swelling, shortness of breath, "heaviness on the head," buzzing in the ears (because of the blast), body aches, deceased vision, heaviness, dry mouth, tachycardia, pain in the neck.

Behavioral Symptoms. Increase in smoking, fear to be alone, going to sleep keeping lights and TV on, "I go to bed with the TV and the lights on, I'm afraid of darkness"; "I don't want to get up, I'm so scared, I just feel safe inside my bed!" Urge to eat sweet things or losing appetite: "Since that day, I'm craving for candy"; "I'm not hungry, I eat because I have to . . ." Some of this changes affected family and friends relations: "Even my girlfriend despised me"; "I'd become very irritable, I yell to my kids, they are shocked by my reactions, I'm not usually like that."

Avoidance and Isolation. "I don't want to see anybody," "I just want to be alone and cry," "I tend to start cleaning the house for no particular reason."

EMDR Therapy Treatment Effects

ANOVA results showed a significant main effect for the condition factor, $F(1, 80) = 67.04$, $p < .000$. SPRINT scores were significantly different across time showing the effects of the EMDR therapy through time, $F(3, 80) = 150.69$, $p < .000$. There was also a significant interaction effect, condition by time, $F(2, 80) = 55.45$, $p < .001$. Data indicated that in the pretreatment measures (Time 1), both group means were higher than the SPRINT cutoff score of 14 (21 for the immediate treatment

TABLE 1. Mean Scores and Standard Deviations on the Short PTSD Rating Interview Scale Assessor's Rating

Group	*N*	Time 1	Time 2	Time 3	Time 4
Immediate treatment condition	13	21.00 (4.22)	3.69 (2.21)	—	2.61 (2.84)
Waitlist/delayed treatment condition control group	12	23.08 (4.73)	25.58 (5.82)	3.58 (2.77)	1.91 (2.10)
Total	25	22.00 (4.50)	13.24 (10.99)	3.58 (2.77)	2.28 (2.49)

condition and 23 for the waitlist/delayed condition). By Time 2, patients in the immediate treatment condition showed significantly lower scores than the patients in the waitlist/delayed control group, $t(11) = -10.08$, $p = .000$. By Time 3, patients in the waitlist condition had received EMDR-PRECI treatment, and their scores were similar to patients in the immediate treatment condition by Time 2. No measures of SPRINT scores were done for patients in the immediate treatment condition at Time 3. By Time 4, both groups showed low scores indicating the maintaining effects of the treatment over time (see Figure 1 and Table 1).

Global Improvement. The SPRINT contains two items to measure global improvement, one assessing percentage change and the other rating severity. Item 1: "How much better do you feel since beginning treatment? As a percentage between 0 and 100." Item 2: "How much has the above symptoms improved since starting treatment? 1 worse, 2 no change, 3 minimally, 4 much, 5 very much."

On Item 1, the mean response at follow-up for the immediate treatment group was 95% and for the waitlist/delayed treatment group it was 97%. On Item 2, the mean response at follow-up for both groups was (5) *very much*.

Discussion

The aim of this research was to evaluate the effectiveness of the EMDR-PRECI in reducing posttraumatic stress symptoms related to the explosion in an explosives manufacturing factory north of Mexico City in which seven employees died. The EMDR-PRECI was administered for two consecutive days to 25 survivors divided randomly into two groups; all patients presented PTSD symptoms related to the critical incident at baseline. The data were analyzed using factorial ANOVA with the effects of the EMDR-PRECI, evaluated with the SPRINT, as dependent variable and group (two groups of patients: immediate treatment group and waitlist/delayed treatment group) and time (four time points) as independent variables. Post hoc analyses using the Scheffe post hoc criterion for significance were carried out. Results showed significant main effects for time and group as well as for the interaction time by group. Results showed an overall subjective improvement in the participants, independently of the group, after receiving EMDR-PRECI treatment. Results also showed that the effect of the therapeutic treatment was maintained over time (106 days from explosion).

The waitlist design controlled for the effects of time. It has been suggested (Norris, Hamblen, Brown, & Schinka, 2008) that symptoms can decrease naturally and spontaneously after a critical incident. This study showed no spontaneous recovery for participants in the waitlist condition. This indicates that the improvement in the immediate treatment condition can be attributed to the EMDR-PRECI treatment and not to the passage of time.

In the pretreatment measures (Time 1), both group means were higher than the SPRINT cutoff score of 14 (21 for the immediate treatment condition group and 23 for the waitlist/delayed treatment condition control group). The final measure (Time 4) confirmed low scores in SPRINT in both groups (three for the immediate treatment condition group and two for the waitlist/delayed treatment condition control group). Although the score was somewhat lower in the delayed treatment condition group, the difference between conditions was not significant. This randomized controlled trial study provides evidence on the EMDR-PRECI efficacy in reducing posttraumatic stress symptoms after a technological disaster. Future research in which participants assigned to a control condition received no therapy postdisaster could measure if the treatment prevented PTSD; however, ethical concerns prohibit such a design.

According to Weisaeth (1994), technological disasters generally cause more severe mental health problems than natural disasters when they are of roughly the same magnitude because they have greater unpredictability, uncontrollability, and culpability. A comprehensive review that analyzed the risk to health following an explosion in a technological disaster was published in 2012 (Finlay, Earby, Baker, & Murray). The review revealed significant and potentially long-term health implications affecting various body systems and psychological well-being following exposure to an explosion. Researchers recommended an awareness of the short- and long-term health effects of explosions to identifying latent pathologies

that could otherwise be overlooked in stressful situations with other visually distracting injuries.

As developing countries industrialize, technological disasters become and increasing threat. We believe that EEI with evidence-based protocols, such as the EMDR-PRECI, has a natural place in the response strategies to reduce the burden of long-term psychological sequelae after a technological disaster.

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