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Treating Trauma: The Efficacy of EMDR as a Treatment for PTSD

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TREATING TRAUMA: THE EFFICACY OF EMDR AS A TREATMENT FOR PTSD

by

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Abstract

This literature review examines the efficacy of Eye Movement Desensitization and Reprocessing (EMDR) relative to other evidence-based treatments for Posttraumatic Stress Disorder (PTSD), such as Prolonged Exposure (PE) and Cognitive Processing Therapy (CPT). The paper explores the problem of PTSD; outlines the history, theory, and initial trials of EMDR; and examines five randomized controlled trials which compare EMDR to PE or CPT. Results suggest that neither treatment model produces significantly greater reductions in PTSD symptoms, though there is some evidence that EMDR may be better tolerated and produce desired results faster than other treatments.

Keywords: EMDR, PTSD, trauma

Treating Trauma: The Efficacy of EMDR as a Treatment for PTSD

Trauma is a ubiquitous part of the human experience. Many people who have experienced trauma, defined as exposure to "actual or threatened death, serious injury, or sexual violence"(American Psychiatric Association, 2013), suffer from Posttraumatic Stress Disorder (PTSD). Discerning the most effective treatment for PTSD is important because it will enable therapists to be optimally effective in relieving this aspect of human suffering. This paper seeks to determine the efficacy of Eye Movement Desensitization and Reprocessing (EMDR) relative to other evidence-based psychological treatments for PTSD. The paper will discuss the diagnosis, prevalence, and history of PTSD; give an overview of primary treatments for PTSD; discuss the history, theory, and procedure of EMDR; and finally, examine clinical trials evaluating the efficacy of EMDR to assess whether EMDR could be more effective at treating PTSD than the other validated treatments.

Posttraumatic Stress Disorder: Definition, Prevalence, and History

An estimated 89.7% of adults in the United States have been exposed to a traumatic event, and about 8.3% of the population will develop PTSD in their lifetime (Kilpatrick et al., 2013). PTSD is more prevalent in women (11.0%) than it is in men (5.4%)(Kilpatrick et al.). In order to be diagnosed with PTSD, an individual must meet the criteria presented in the Diagnostic and Statistical Manual (DSM-5). The individual is persistently affected by his or her trauma, reacting to normal life experiences as if he or she is still in danger or being threatened by the traumatic event. His or her daily functioning is impaired: he or she experiences symptoms of (a) intrusive memories, nightmares, or flashbacks, (b) avoidance of memories or external reminders of the trauma, such as people, places, or situations, (c)

persistent negative alterations in moods or cognitions, such as distorted beliefs about the cause of the trauma or diminished interest in important activities, and (d) alterations in arousal and reactivity, such as an exaggerated startle response or difficulties concentrating (American Psychiatric Association, 2013).

Despite the fact that individuals with PTSD sometimes appear healthy to others, those with the disorder experience significant internal distress as well as impairment in functioning. Some individuals with PTSD react outwardly through aggression, domestic abuse, or excessive drug or alcohol use. Their traumatic memories have taken over their lives; they are either consumed by memories and fear, or they dissociate from present experiences and feel nothing at all. According to the DSM-5, individuals with PTSD may have markedly reduced interest in activities they previously enjoyed, may be quick tempered and react aggressively with little provocation, and may engage in dangerous behaviors such as reckless driving or self-harm (American Psychiatric Association, 2013). Risk of suicide is significantly greater in those with PTSD than it is in the general population (Brenner et al., 2001; Tarrier & Gregg, 2004). Individuals with PTSD also have a higher risk of nicotine dependence and drug abuse or dependence than people who are not exposed to trauma and those who are exposed to trauma but do not develop PTSD (Breslau, Davis, & Schultz, 2003).

This cluster of symptoms has not always been recognized as a disorder. After WWI, veterans experiencing the symptoms of what we now call PTSD were said to have “shell shock” (Wylie, 2004). In the late 1970’s, traumatized veterans from the Vietnam War were given diagnoses such as alcoholism, depression, mood disorder, and schizophrenia. It was

not until 1980 that a group of veterans, along with two psychologists, lobbied the APA to create a diagnostic label for PTSD (van der Kolk, 2014). Establishing PTSD as a real diagnosis led to a better understanding of what these veterans were experiencing. It also allowed opportunities for research, as funding for research could not be obtained for a diagnosis that did not exist.

Treatments

Since the 1980's, a few treatments have been developed and established as approved treatments for PTSD. The primary evidence-based treatments for PTSD are EMDR and trauma-focused cognitive behavioral therapies (CBT) such as Prolonged Exposure (PE) and Cognitive Processing Therapy (CPT)(Hamblen, Schnurr, Rosenberg, & Eftekhari, 2014; National Center for PTSD, 2011). Ponniah and Hollon (2009) designate EMDR and CBT as the empirically supported treatments for PTSD, though they acknowledge that further research should be done with these and other therapies, and with different populations.

Exposure therapies, a type of CBT, were originally developed to treat anxiety disorders, so their use in the treatment of PTSD reflects a conceptualization of PTSD as an anxiety disorder. Proponents of this therapy model believe that the avoidance associated with PTSD prevents clients from processing their traumatic memories, which negatively reinforces the avoidance, along with perpetuating the negative emotions and fear that arise when they encounter triggers or reminders of their trauma (Cason, Grubaugh, & Resick, 2002). Therefore, exposure to these memories and emotions in a therapeutic setting will allow them to confront their trauma and relieve some of their symptoms.

There are a few forms of exposure therapy that vary in the way the client is exposed to stressful cues. One form of exposure therapy, systematic desensitization, builds a hierarchy of fear cues ranging from low to high stress and combines exposure to these cues with learned relaxation techniques. The client will encounter a feared image or memory while practicing muscle relaxation strategies. When the client can successfully use relaxation to overcome their stress response to a low cue, they move on to the next cue in the hierarchy. In contrast, flooding, or direct therapeutic exposure (DTE), utilizes extended exposure to the cues that produce the highest fear or anxiety response. A third form, prolonged exposure (PE), was developed specifically for trauma victims. PE uses exposure to the entire traumatic memory rather than small cues or pieces of the memory. Clients are also taught relaxation techniques as coping skills to help them manage their response to cues or triggers outside of the therapy setting, though the exposure itself is thought to constitute the core curative feature of treatment (Cason et al., 2002).

Another evidence-based treatment for PTSD is cognitive processing therapy (CPT). This therapy assumes that trauma produces not just fear, but other emotions such as anger, humiliation, shame, and sadness. In this view, an effective treatment must address processing and understanding the meaning of the trauma, given that the unprocessed negative emotions may prevent recovery. CPT focuses on the traumatic memory and the feelings, thoughts, and beliefs that accompany it. The goal of this therapy is to modify the extreme beliefs that have resulted from the client's traumatic experience. CPT includes an element of exposure as well by having clients repeatedly reread a written account of their trauma.

The two treatment models described above, PE and CPT, have been promoted by the Veterans Health Administration for the treatment of PTSD. However, Steenkamp and Litz (2014) argue that it is insufficient to promote only these two models. They say that randomized controlled trials have shown that these therapies work in reducing some symptoms, but not always enough that the client no longer meets diagnostic criteria for PTSD. Additionally, the treatments do not work for all clients. They argue that there needs to be an alternative treatment available for clients who are not helped by PE or CPT. Steenkamp and Litz's article shows that though there have been many trials testing PTSD treatments, the debate over which treatments are most effective continues.

History and Theory of EMDR

EMDR was developed in the spring of 1987 through the personal observations of Francine Shapiro. While walking through the woods, Shapiro noticed that the disturbing thoughts that had been bothering her would disappear when she moved her eyes back and forth. When she consciously brought back the disturbing thoughts, they were not as disturbing as they had been before (Shapiro, 2001). Shapiro says that the reason traumatic memories are so powerful in affecting an individual's present is that the traumatic memories are "dysfunctionally stored in the wrong form of memory": they are stored as present, implicit memories rather than past, explicit memories. Most past events are stored in a type of explicit memory called episodic memory and can be brought to our attention. Implicit memories, on the other hand, influence our actions and behaviors without us bringing the memories into our consciousness. Shapiro saw a connection between her own reprocessing of memories while her eyes moved, and the eye movements that take place

during REM sleep.[1] She thought that if these eye movements were connected to memory processing during sleep, perhaps they could also help us process memories while awake (Luber & Shapiro, 2009).

Shapiro thought that if this use of controlled eye movements was helpful for her, she might be able to use it to help others also, so she starting practicing the eye movement technique on other people. For six months, she tested various strategies, changing the speed of the movements and asking clients to focus on different things, to see what techniques seemed to produce the best results (Shapiro, 2001). Shapiro did her first controlled study in the winter of 1987, and it was published in 1989. She first thought of the therapy simply as a new desensitization technique, so for a few years it was known as Eye Movement Desensitization (EMD). In 1991 she changed the name to EMDR to reflect the importance of the reprocessing that occurs during treatment (Luber & Shapiro, 2009).

The perspective that supports EMDR conceptualizes trauma as a harmful memory "stuck" in the wrong part of the brain, or stored in the wrong form of memory (Shapiro, 2001; Wylie, 2004). According to Wylie (2004), Bessel van der Kolk, director of the Trauma Center in Boston, also sees trauma as involving a physical helplessness. He believes trauma emerges when an individual is unable to respond to a bad situation in order to change it; therefore, for a treatment to effectively respond to trauma, it must give the individual a way to engage in meaningful action. Van der Kolk supports EMDR, as well as somatic therapies (which emphasize the experience of the body), over talk therapies (which simply involve talking with a therapist).

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[1] REM sleep, a stage of sleep named for its characteristic rapid eye movements, facilitates learning by consolidating nondeclarative (implicit) memories (Carlson, 2015).

EMDR Procedure

Francine Shapiro (2001) explains the essential components and eight phases of EMDR. One important component is for the client to identify a mental image to focus on throughout the session that represents the most distressing part of their trauma. The client also must identify a "negative cognition" and a "positive cognition." The negative cognition represents a negative belief or assessment about oneself that the client believes in relation to the trauma (examples include "I am powerless" or "I am unable to succeed"). It is important that this statement be an interpretation rather than an incontrovertible statement or fact, because part of the treatment involves reducing the client's belief in this cognition. It is also important that the client develops the cognition on his or her own, though the therapist may guide him or her with examples. The positive cognition is a positive belief about oneself that provides an alternative to the negative cognition and a direction for treatment. This cognition must be a realistic goal, and should include an internal locus of control, meaning it is within the client's own control and is not dependent on how others perceive or treat him or her (examples Shapiro gives include "I did the best I could" and "I am loveable," rather than something like "others will love me" or "I will not get hurt again"). Two measures necessary for EMDR are the Validity of Cognition (VOC; 1 = completely false, 7 = completely true) and Subjective Units of Disturbance (SUD; 0 = neutral intensity, 10 = highest possible anxiety) Scales, which are used to measure the client's belief in the positive cognition and how upsetting they currently find their traumatic memory, respectively. At designated points throughout treatment, the therapist prompts the client to use these two scales to rate emotions while processing traumatic memories.

Another essential component of EMDR is the use of directed eye movements, which are meant to stimulate the client's information-processing system. These are used in phases four through six, and are continued until the goal of each phase is met. Depending on therapist and client preferences, alternate bilateral stimulation such as hand taps or auditory stimuli can be used.

EMDR has eight treatment phases. Shapiro (2001) explains that the number of sessions devoted to each phase, and how many phases are included in a session, are variable; the therapist must determine what is appropriate for each client. Phase one, client history and treatment planning, allows the therapist to determine the client's targets and develop a treatment plan based on client needs. In phase two, preparation, the therapist explains the theory and procedures of EMDR to the client, making sure they know they will likely experience emotional disturbance as they focus on their traumatic memories.

In phase three, assessment, the client identifies the target image, negative cognition, and positive cognition. They rate their belief in the positive cognition using the VOC. They also focus on the negative cognition in conjunction with the target image and assess their level of disturbance on the SUD scale. This provides a baseline rating response to the target memory.

Phases four through six utilize the eye movement component and constitute the accelerated reprocessing portion of the treatment. Phase four, desensitization, focuses on reducing the distress associated with the target image and negative cognition. The therapist moves through sets of guided eye movements (or other stimulation) while the client focuses on their target image. Therapists are taught to start with sets of around 24

eye movements. Between sets, the therapist guides the client's focus as necessary. This phase continues until the client's SUD rating is reduced to 0 or 1.

Phase five, installation, is focused on increasing the strength of belief in the positive cognition. The therapist will direct the client to focus on their positive cognition before starting the sets of eye movements. This phase continues until the VOC reaches a 7.

During phase six, body scan, the client focuses on both the target image and the positive cognition while undergoing sets of eye movements, paying attention to any physical tension or sensations that arise. When these sensations are identified, the client continues with sets of eye movements until the tension is resolved.

Phase seven, closure, happens at the end of each session whether or not the reprocessing is complete. In this phase, the therapist helps the client return to a balanced emotional state and gives them tools to manage emotions and disturbances that may arise between treatment sessions. These tools include visualization techniques and keeping a log of disturbing emotions and thoughts that arise. In phase eight, which should be repeated at the beginning of each new session, the therapist guides the client to reaccess previously addressed targets. This allows the therapist to check in with the client and determine whether or not the effects of the previous session were maintained.

Treatment outcomes

To determine the efficacy of a treatment, it must be tested against alternatives in a controlled setting. The first EMDR study was conducted by Shapiro herself, comparing EMDR against a placebo treatment. Since then, randomized controlled trials have tested the efficacy of EMDR against wait list control groups, nonvalidated treatments (those which

have not been supported by randomized controlled trials), and evidence-based treatments for PTSD.

Initial clinical studies

Francine Shapiro's first controlled study of EMDR (under the name Eye Movement Desensitization, or EMD, at the time) was conducted in 1987. She randomly assigned 22 participants to either receive EMD or an alternative treatment described below that provided the same amount of time in therapy and exposure to the trauma memory, but without the EMD. Participants in both groups completed the preliminary steps of identifying a target image, a negative cognition, and a positive cognition before spending a single session with a therapist describing and being exposed to their trauma memory. Participants in the non-EMD group were asked to describe their trauma memory in full detail, providing exposure to the trauma memory.

After treatment, the experimental group that received EMD had lower anxiety and a higher belief in their positive cognition. The non-EMD group had higher levels of anxiety than they did before treatment, which Shapiro says is consistent with the first stages of exposure treatments. After the study was completed, the participants in the non-EMD group also received EMD therapy (Shapiro, 1989).

Literature reviews

Cahill, Carrigan, and Frueh (1999) conducted a literature review to evaluate whether or not EMDR is successful compared to (a) no treatment, (b) non-validated treatments, and (c) evidence-based treatments. They note that at the time of their review,

there had been no studies comparing EMDR to other evidence-based treatments for PTSD such as PE or CPT.

The authors first examined ten studies that compared EMDR treatment to a control group. These studies can tell us whether or not EMDR is better than getting no treatment at all. Two studies supported the efficacy of EMDR, but the validity of these studies is questionable because the participants were not randomly assigned to the groups. Three studies gave mixed support: Participants who received EMDR improved on some, but not all, measures. One additional study showed that EMDR produced significantly greater reduction of avoidance, hyperarousal, and depression symptoms. The four remaining studies provided strong evidence for EMDR in reducing the symptoms of PTSD.

Next, Cahill et al. (1999) examined six studies comparing EMDR to other non-validated treatments. These treatments control for nonspecifics, or the generic effects of being in treatment, such as having a supportive relationship with a therapist or the expectation of improvement. The analysis of these studies suggests that EMDR produced significantly better results than treatments such as Image Habituation Training (a variant of exposure therapy), relaxation, and active listening. One of these studies was conducted in an HMO setting, and EMDR was compared to a mixture of treatments under the label of "standard care." The efficacy of EMDR in this setting has particularly high external validity.

Cahill et al. (1999) make no claims about the relative efficacy of EMDR compared to other validated treatments because at the time of their publication, there had been no studies directly comparing EMDR with other validated treatments. Although we can conclude from their research that EMDR does work well compared to no treatment at all or

compared to a non-validated treatment, we cannot determine how successful EMDR is in relation to treatments like PE and CPT.

Clinical trials

To determine the efficacy of EMDR in relation to other evidence-based treatments such as PE and CPT, EMDR must be directly compared to one or both of these treatments in a randomized controlled trial. The EBSCO PsycINFO database was searched for such trials, and five publications were found (Devilly & Spence, 1999; Ironson, Freund, Strauss, & Williams, 2002; Lee, Gavriel, Drummond, Richards, & Greenwald, 2002; Power et al., 2002; Taylor et al., 2003). All five compared EMDR to a treatment protocol that involved elements of exposure. Two studies added elements of Stress Inoculation Training (SIT; a set of relaxation strategies) to the exposure protocol (Devilly & Spence; Lee et al.), and two added cognitive restructuring to the exposure protocol (i.e., learning to identify and challenge negative thoughts; Devilly & Spence; Power et al.). One study compared EMDR to exposure therapy and a third treatment, relaxation training (Taylor et al.). Only one used a wait list control group (Power et al.).

Devilly and Spence (1999) investigated the efficacy of EMDR compared to a variant of cognitive behavioral therapy that they call the Trauma Treatment Protocol (TTP). TTP utilizes aspects of stress inoculation training (SIT), prolonged exposure (PE), and in-depth cognitive therapy. Devilly and Spence randomly assigned 23 participants to one of the two treatment groups using a stratified randomization technique. Data was collected pre-treatment, post-treatment, and at 2-week and 3-month follow-ups. Authors used

measures of PTSD symptoms, anxiety, depression, and global distress to assess the severity of participants' symptoms.

The TTP condition consisted of nine 90-120 minute sessions. In these sessions, participants were taught anxiety management techniques and coping strategies. Behavioral experiments and cognitive challenging were used to challenge participants' irrational beliefs associated with their traumatic memories. The fourth session included 60 minutes of exposure to traumatic memories, and the fifth through ninth sessions included 30-45 minutes of exposure.

The EMDR treatment protocol followed the treatment described by Shapiro in 1995. The first session was used for assessment and exploration of the trauma and participant's history, followed by eight treatment sessions of the same length as the TTP sessions.

Devilly and Spence found that TTP was more effective than EMDR on all measures of PTSD, and that this difference grew through a 3-month follow-up period. They also reported on measures of clinical change after treatment, indexes of whether or not participants experienced meaningful changes in symptoms and if they still meet criteria for PTSD after treatment. After treatment, according to one measure used to diagnose PTSD, 10 out of 12 participants in the TTP condition no longer met diagnostic criteria, compared to 4 out of 11 in the EMDR condition. The difference in these rates of change was statistically significant ($p < .04$). According to a second PTSD measure, however, 7 out of 12 participants in the TTP condition no longer met diagnostic criteria compared to 3 out 11 in the EMDR condition. This difference was not statistically significant. Treatment distress measures showed no difference between treatment groups. Devilly and Spence concluded

that TTP was both clinically and statistically more effective than EMDR, both in the short and long term.

Power et al. (2002) conducted a trial to compare the efficacy of EMDR versus exposure plus cognitive restructuring (E + CR) versus a wait list control group (WL). Participants in the WL group were offered active treatment at the end of the study. 105 participants were randomly assigned to a treatment group. Data from the 72 participants who remained at the end of the study were analyzed. Power et al. used measures of PTSD symptoms, depression, and anxiety, as well as a measure of daily social functioning, to assess the frequency and intensity of participant symptoms.

Power et al.'s EMDR protocol followed Shapiro's (1995) outlined procedures and included all eight phases. Either guided eye movements or alternating hand taps were used as bilateral stimuli. The E + CR protocol included (1) client assessment, (2) explanation of treatment rationale, (3) intervention sessions which included imaginal exposure, in vivo exposure, and evaluation and modification of negative thoughts, and (4) provision of audio taped copies of the imaginal exposure sessions for participants to listen to once per day as homework. Participants in both active treatment groups received up to ten 90-minute treatment sessions.

Analysis of the statistical significance of participant pre- and post-treatment scores shows that EMDR was more effective than WL on all outcome measures, and E + CR was more effective than WL on a subset of the outcome measures. There was no significant difference found between EMDR and E + CR on any of the outcome measures. Effect sizes

calculated by Power et al. show that on all outcome measures, pre-post change was greater for EMDR than for E + CR.

Power et al. state that statistical significance may have little clinical significance. They determine clinical significance by assessing whether a client's outcome is less than two standard deviations below the pre-treatment mean of the clinical population. The majority of WL participants show no clinically significant change. There were no significant differences found between EMDR and E + CR groups in the proportion of participants showing clinically significant change on measures of PTSD or anxiety. Therefore, they argue that EMDR and E + CR are equally clinically effective in treating PTSD. On one measure of depression, 81% of EMDR participants compared to 43% of E + CR participants achieved a clinically significant change, and this difference was significant ($p < 0.05$). The only other measure that showed a difference between EMDR and E + CR groups was one measuring daily social functioning, with 70% of EMDR participants and 38% of E + CR participants achieving a clinically significant improvement. Power et al. also noticed a significant difference in the rapidity of response to each treatment: The EMDR group received a mean of 4.2 sessions, and the E + CR group received a mean of 6.4 sessions ($p < 0.05$). They concluded that EMDR and E + CR were equally effective in treating PTSD, though EMDR had a slight advantage in reduction of depression and the use of fewer sessions.

Lee, Gavriel, Drummond, Richards, and Greenwald (2002) compared the efficacy of EMDR to Stress Inoculation Training with Prolonged Exposure (SITPE). Their purpose was to further investigate the effects found by previous studies, including that of Devilly and Spence (1999), whose methodology they criticize, as they claim it did not follow standard

protocol. Lee et al. randomly assigned 24 participants to receive either EMDR or SITPE. They used measures of PTSD symptoms and depression to assess severity of participant symptoms. Both treatment protocols consisted of seven 90-minute weekly sessions.

The SITPE protocol used by Lee et al. (2002) was based on Edna Foa's 1991 treatment manual. The first two sessions included assessment, education about treatment, and gathering of trauma-related information. The third session involved the first segment of prolonged exposure. The fourth through seventh sessions involved teaching coping skills and carrying out imaginal exposure. The EMDR protocol followed the eight-phase procedure described by Francine Shapiro (1995). Therapists used guided eye movements as bilateral stimulation.

Lee et al. (2002) found that there were no significant differences between conditions following treatment. However, at the three-month follow-up, differences between treatments were assessed using a multivariate analysis of covariance (MANCOVA), comparing scores on all four measures at follow-up with pretreatment scores. They found a significant main effect for condition favoring EMDR ($p < .05$). Another MANCOVA tested difference in improvement on the intrusion measures, and there was a significant main effect favoring EMDR ($p < .05$). There was no significant difference found between treatments on measures of avoidance, either at post-treatment or at follow-up. There was also no significant difference found between groups in the proportion of people who no longer met diagnostic criteria for PTSD after treatment.

The authors measured clinically significant change by using a cut-off score two standard deviations below the pretreatment sample mean. At post-treatment, each

treatment had produced clinically significant change in 66.7% of participants. At follow-up, 91.7% of participants in EMDR group had achieved clinically significant change, compared to 50% of the SITPE group. This difference between groups was statistically significant ($p < .05$). Another consideration that Lee et al. discuss is the efficiency of treatments. The SITPE protocol calls for clients to do seven hours of homework every week, adding up to 42 hours over the course of treatment. They estimate that EMDR requires only three hours of homework over the course of treatment. They also suggest that clients may prefer EMDR over SITPE, because EMDR does not require them to recount details of their trauma to their therapist as SITPE does.

Taylor, Thordarson, Maxfield, Fedoroff, Lovell, and Ogrodniczuk (2003) compared the efficacy of exposure therapy, EMDR, and relaxation training. Sixty participants, all of whom met diagnostic criteria for PTSD, entered the trial, and 45 completed treatment. Symptoms were assessed using measures of PTSD severity and depression. Taylor et al. used the subscales of these measures to separately assess four dimensions of PTSD symptoms: (a) reexperiencing, (b) avoidance, (c) numbing of general responsiveness to stimuli, and (d) hyperarousal. The Reactions to Treatment Questionnaire was used to measure the clients' perceptions of treatment credibility.

Participants were randomly assigned to one of the three treatment conditions. Each condition consisted of eight 90-minute treatment sessions. The exposure therapy protocol involved four sessions of imaginal exposure to the traumatic event, in which the participant talked about the event in first-person and in the present tense, and listened to an audiotape of the session for one hour every day. This was followed by four sessions of in vivo

exposure, with one hour of live exposure homework every day. The relaxation training protocol involved three different relaxation exercises, which were each used during one of the first three sessions. In the following sessions, participants chose one of these three, or some combination of the three. For homework, participants listened to a recording of the therapist reading a relaxation script for one hour every day. The EMDR protocol followed Shapiro's (1995) procedures and phases. Taylor et al. added the Safe Place exercise, a distress-reducing coping strategy, to the first session, and this was subsequently practiced as a homework assignment as needed. Bilateral stimulation was produced with therapist guided eye movements; in cases where the eye movements caused discomfort, hand tapping was used instead.

At post-treatment and at follow-up, Taylor et al. found exposure to be more effective than relaxation training in reducing the proportion of participants who met diagnostic criteria for PTSD ($p < 0.02$). There was no statistically significant difference between EMDR and relaxation ($p > 0.1$) or between EMDR and exposure ($p > 0.05$) for these assessments. For each treatment condition, measures of PTSD symptoms declined significantly for each symptom dimension, showing that each treatment produced a significant improvement in each dimension. Each dimension was also assessed using a repeated-measures analysis of covariance (ANCOVA) to show treatment differences over time for each dimension. The authors found significant main effects of treatment for symptoms of re-experiencing and avoidance, but not for numbing or hyperarousal. For reexperiencing symptoms, exposure therapy was more effective than both relaxation training ($p < 0.01$) and EMDR ($p < 0.02$). Exposure therapy was also more effective for reducing symptoms of avoidance than either

relaxation training ($p < 0.001$) or EMDR ($p < 0.05$). There was no significant difference between EMDR and relaxation training for these two dimensions.

As a measure of clinical significance on each of the four PTSD dimensions, Taylor et al. assessed the proportion of participants who had a reduction in scores of at least two standard deviations below pretreatment levels. At follow-up, exposure was more clinically significant than relaxation on the three dimensions of reexperiencing ($p < 0.03$), avoidance ($p < 0.01$), and hyperarousal ($p < 0.03$). There were no other statistically significant differences in clinical significance at follow-up. For sustained improvement (clinically significant improvement both at post-treatment and at follow-up), exposure therapy was more effective than relaxation training on reexperiencing ($p < 0.03$) and avoidance ($p < 0.03$), and was also more effective than EMDR on reexperiencing ($p < 0.01$) and avoidance ($p < 0.03$).

Taylor et al. also measured speed of treatment-related changes using a repeated-measures ANCOVA. They found that while scores declined significantly in all three treatment groups, exposure was significantly more effective than relaxation training at reducing symptoms of avoidance ($p < 0.006$). There were no other significant interactions between treatment and time. This analysis suggests that exposure tends to work faster than relaxation at reducing avoidance.

Taylor et al. concluded that all three treatments were effective in reducing the symptoms of PTSD, though to varying degrees: Exposure was significantly more effective than EMDR and relaxation training at reducing symptoms of reexperiencing and avoidance. All three treatments were also associated with reduced depression, as well as reductions in

trauma-related anger and guilt. Exposure therapy worked faster at reducing avoidance, and yielded the greatest number of participants who no longer met diagnostic criteria for PTSD after treatment.

Lastly, Ironson, Freund, Strauss, and Williams (2002) compared the efficacy of EMDR and Prolonged Exposure (PE). A total of 22 participants were randomly assigned to receive either EMDR or PE. Authors used measures of PTSD symptoms, depression, and distress to assess client symptoms. The first three treatment sessions were the same for both treatment groups, and included evaluation and preparatory work. Sessions 4-6 consisted of active treatment for each group.

The active EMDR treatment followed Shapiro's 1995 protocol, and included all eight phases. The therapist used guided eye movements as bilateral stimulation. The active PE protocol focused on imaginal exposure, in which the participant described his or her trauma in the present tense as if he or she were experiencing it again. Both experimental groups utilized in vivo exposure as a homework exercise between sessions. This type of exposure is a standard part of the PE protocol, but is not part of standard EMDR protocol. While EMDR does include elements of exposure to the traumatic memory, homework assignments like this are not typically included. The researchers included this homework for both experimental groups so that any outcome differences could be attributed to what the client experienced in therapy sessions, not to their homework assignments.

They found that after six sessions, both EMDR and PE significantly reduced symptoms of PTSD ($p = .008$; $p = .002$) and depression ($p = .001$; $p = .001$). No difference was found between treatments in reducing symptoms of either PTSD ($p = .82$) or

depression *(p* = .25*)*. These treatment gains were maintained at a three-month follow-up. EMDR reduced symptoms faster: SUDS ratings were more significantly reduced after one session of EMDR than they were after one session of PE (p = .01). EMDR also had a significantly lower dropout rate (p = .05), which suggests that it was better tolerated than PE.

Discussion

Three studies failed to find significant differences between EMDR and other evidence-based treatments on particular outcome measures. Ironson et al. (2002) showed that both EMDR and PE significantly reduced symptoms of PTSD and depression, and they found no significant difference between the two. Power et al. (2002) found no significant differences between EMDR and E + CR, either statistically or clinically. Taylor et al. (2003) found no difference between EMDR and exposure therapy, or between EMDR and relaxation, in the proportion of participants who no longer met diagnostic criteria for PTSD after treatment. Additionally, they found no significant difference between treatments in reducing symptoms of numbing or hyperarousal.

One factor that may have impacted the failure of these studies to detect significant differences was the low sample size of each study. Low sample sizes mean that the studies have low statistical power, which inhibits the ability to detect a significant difference even if one exists. Finding no significant difference between treatments in a study with insufficient power does not mean that the treatments are necessarily equally effective, it just means that the trial was not able to detect a difference with its particular analysis.

Three studies provide evidence that EMDR might have an advantage over other evidence-based treatments on particular outcomes. Ironson et al. (2002) found that EMDR had a significantly lower dropout rate than PE, suggesting that clients may tolerate EMDR better than PE. They also found that SUDS scores decreased significantly more after one session of EMDR than after one session of PE, suggesting that EMDR may work faster. Lee et al. (2002) found that at follow-up, EMDR had been more effective than SITPE in reducing all symptoms. EMDR also produced significantly more clinically significant change than SITPE. When specific measures were analyzed, they found that EMDR produced a significantly greater reduction in symptoms of intrusion. EMDR was also more efficient, since participants in the EMDR group had less homework than those in the SITPE group. Finally, Power et al. (2002) found that EMDR had an advantage over the E + CR protocol in the reduction of depression and in the use of fewer sessions needed to produce significant improvement.

Two studies provide evidence that EMDR may be less effective than other treatments on specific outcomes. Taylor et al. (2003) found that exposure therapy was more effective in reducing symptoms of reexperiencing and avoidance, both statistically and clinically. Devilly and Spence (1999) found EMDR to be both clinically and statistically less effective than TTP, both in the short and long term. Both Ironson et al. (2002) and Lee et al. (2002) comment on Devilly and Spence's study in their own publication. Ironson et al. point out that Devilly and Spence's study has been the only one to report PE as more effective than EMDR. Lee et al. criticize Devilly and Spence's methodology, saying that the way they assigned participants to treatments was questionable; they strayed from the

standard EMDR protocol; and they did not meet the standards of Foa and Meadows (1997), who propose standards for methodologically sound PTSD research, because they did not use multiple therapists for each condition.

Two of the studies pointed out observations that may not relate directly to EMDR's relative efficacy, but are interesting to consider nonetheless. Ironson et al. (2002) observed that the participants in their study who were most resistant to any treatment were those whose trauma involved feeling guilty for the death or injury of another person. If guilt is a variable that consistently impedes successful treatment, it would be useful to explore this further to determine if any treatments or treatment supplements could be more successful at alleviating trauma related guilt. Power et al. (2002) noticed that while 5.5% of their participant group was using prescribed psychotropic medications at the time of their trauma, 72.2% of the group was using these medications at the beginning of the trial. This might suggest that the majority of clients who seek treatment for trauma are prescribed medications. Additionally, since these clients met diagnostic criteria for PTSD and were still affected by their trauma at the start of the trial, this suggests that the medications may not have been helpful for this group of clients (though the study was not designed to test the efficacy of medications versus therapy, nor does it make any claims as such).

Conclusion

Evidence from the above studies does not lead to a conclusive assessment of whether EMDR is more or less effective than the other evidence-based treatments. The low statistical power resulting from the low sample sizes of each trial make it hard to detect meaningful difference between groups. However, it appears that EMDR is at least as

effective as other treatments, and in some cases, it may have an advantage in speed of treatment or in client tolerability. Further research should make an effort to use larger sample sizes, and should also examine what client factors may make an individual a better candidate for one treatment over the others.

Another area that needs to be explored is the dissemination of evidence-based treatments. Foa, Gillihan, and Bryant (2013) say that despite the research that has accumulated on PTSD treatments, the majority of individuals with PTSD receive treatments that are not evidence-based. Most psychologists choose not to use evidence-based treatments when creating a treatment plan for clients with PTSD. In fact, Foa et al. cites a survey showing that psychologists indicated that empirical evidence has little impact on their treatment practices (Cook, Schnurr, Biyanova, & Coyne, 2009). When so much research has been done to test the efficacy of treatments, it is unfortunate that these treatments are not being put into practice. It would be useful to explore why this is the case, and determine what methods would be most useful in ensuring greater use of evidence-based treatments.

Trauma continues to be a common part of the human experience, with many individuals experiencing trauma such as war, violent shootings, and physical and sexual violence and abuse. PTSD will continue to be a problem, and if not properly treated, will have a persistent negative impact on many lives. Finding the best treatment methods, and making sure these treatments are available to all who need them, will help relieve the suffering of those affected by trauma.

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Appendix

Faith and Scholarship

As George Marsden (1998) points out in his text *The Outrageous Idea of Christian Scholarship,* no scholar works and learns in a vacuum. We all operate within certain frameworks that have been shaped by our beliefs and cultures. No matter what discipline a scholar chooses to explore, his or her understanding will be colored by his or her worldview, which can include the beliefs he or she has about God and God's connection to humanity. Marsden argues that as Christian scholars, our belief in a God "of immense intelligence, power, and concern for us" should impact, at the very least, "our view of the relative significance of the other aspects of reality that we deal with in our scholarship" (83). With this in mind, it is important for me to examine and understand how my own faith commitments influence my scholarship.

As a believer in Christ, I strive to understand and follow Christ's example and teaching, and this commitment certainly has an impact on my work as a scholar. Christ's most important message to us, as far as I understand it, is that we are supposed to love and take care of the people around us. This call can manifest itself in many ways, from feeding the hungry to sheltering the homeless to fighting for the rights of oppressed minorities. The discipline of psychology is able to answer this call by providing effective therapies and treatments for people who are struggling with psychological illnesses and disorders.

The World Health Organization (2001) estimated that one in every four people in the world would be affected by a mental or neurological disorder in their lifetime. When these disorders are not treated, the people involved suffer and their quality of life declines.

As a Christian and a scholar in the field of psychology, I feel a responsibility to do what I can to help alleviate the suffering of people with mental disorders.

As I think about what it means to be a scholar, it is helpful to look at how others before me have defined scholarship. According to Jacobsen and Jacobsen (2004), "the primary task of scholarship is to 'pay attention' to the world … with a sense of focus, care, and intensity" that others lack. Only by paying attention can we discover and delve into new information. Paying attention can mean different things to different scholars. For some, it means "intervening, encouraging certain outcomes and discouraging others." For my own scholarship, particularly as I look at effective treatments for PTSD, this means carefully discerning what appears to be the most effective, encouraging the dissemination and use of more effective treatments, and discouraging the continued use of treatments that are widespread but ineffective.

Another model of scholarship presented by Ernest Boyer (1997) defines four "separate but overlapping" functions of scholarship. These four functions are discovery, integration, application, and teaching. The two functions that resonate most with my scholarship in this season are integration and application. Boyer defines integration as work that "seeks to interpret, draw together, and bring new insight to bear on original research." Though I have not conducted any of my own trials, I hope that by examining the research that has already been done I may bring a new interpretation to the data. Through application, we ask how "knowledge [can] be responsibly applied to problems" and how it can "be helpful to people and institutions." One of the goals of my project is to ask how the

current body of knowledge can be interpreted and best applied to the problem of PTSD in our society.

Overall, then, my faith informs my scholarship by providing me with the motivation for and reasons why I plan to carry out this research. Because of my faith, and my belief that Christ has called us all to serve and to help one another, I am motivated to examine models of effective treatment for PTSD. The models of scholarship that other scholars have provided are helpful for framing what my scholarship can and should do: It should pay attention to the world with a discerning eye, bring new insight to old ideas, and apply knowledge to solve problems and help people.

In addition to shaping scholarship, faith and spirituality may also play a role in relieving traumatic stress and contributing to an individual's growth after experiencing a trauma. There is a growing body of literature examining this concept of posttraumatic growth (PTG). For example, DeCastella and Simmonds (2013) found a strong link between spirituality and PTG. Following trauma, some individuals experience religious and spiritual growth, which then provides them with a framework that helps them find meaning in their suffering.

Gerber, Boals, and Schuettler (2011) explore the impact that religious coping mechanisms can have on the development of PTSD or PTG after trauma. They differentiate between positive religious coping behaviors, such as seeking spiritual support and receiving benevolent religious appraisals, and negative religious coping behaviors, such as spiritual discontent and punitive religious reappraisals. They found that positive religious coping was more strongly connected to PTG, while negative religious coping was more

strongly connected to PTSD. Their findings suggest that an individual's spiritual practice may mediate the development of PTSD or PTG. An implication of this finding for spiritual and religious communities is that we should encourage positive religious coping, making sure trauma victims receive validation and support rather than shame and isolation.

My scholarship, and my interest and motivation for researching treatments for PTSD, are strongly influenced by my Christian worldview. Christ calls us to love and to serve, and I may do this through research, the integration and application of existing ideas, and the encouragement of spiritual communities to foster positive coping and posttraumatic growth. Through this, I hope to play a role in relieving the profound suffering of those around us who experience trauma.