A Teaching Module on the Use of Eye Movement Desensitization and Reprocessing as Part of a Multidisciplinary Treatment Regimen for Patients With Chronic Pain Disorders

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Abstract

Background: Chronic pain is an underdiagnosed and undertreated medical ailment in the United States. Despite the plethora of services available, patients continue to experience chronic pain that impairs quality of life and personal well-being both physically and mentally. Failure of medical management leads to adjunctive and complementary treatments. Eye Movement Desensitization and Reprocessing (EMDR) is a psychotherapy technique that can be tailored to patients in the treatment and management of chronic pain disorders such as phantom limb pain and rheumatoid arthritis. This quality improvement project aimed to inform anesthesia providers of the benefits that EMDR can provide as an adjunctive pain management option for outpatient or inpatient pain management.

Method: A literature review determined the efficacy of EMDR in the treatment of chronic pain and the methods of delivery. Articles were obtained from PubMed, Embase, CINAHL, and APA PsycNet for references and background information on the topic from 2008 to 2023. Inclusion criteria consisted of chronic pain management and adjunctive treatment for pain management. An education module would be presented followed by an anonymous data collection survey of anesthesia providers. The educational module provided a pretest and posttest questionnaire/survey to evaluate the efficacy of the educational module.

Results: Following deployment of the educational module, pre and post-test questionnaires had shown a significant increase in participant knowledge for EMDR. This would highlight a successful educational module with adequate learning and increase in over half of the questionnaire provided.

Keywords: Eye movement desensitization and reprocessing, EMDR, chronic pain, AIP model, adjunctive pain management

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Problem Statement

Chronic pain is an underdiagnosed and undertreated medical ailment in the United States. Despite a plethora of services available, patients continue to experience chronic pain that impairs quality of life and personal well-being both physically and mentally. Where medical management fails, complementary medical treatments can help alleviate pain and prevent the onset of chronic pain and its debilitating effects. Utilizing the psychological therapy of Eye Movement Desensitization and Reprocessing (EMDR) as an adjunct to traditional pain management protocols has proven to alleviate chronic pain's symptomatology profoundly.

Purpose

The purpose of this paper was to discuss the relevance and benefit that EMDR can provide to patients experiencing chronic pain syndromes. A growing body of evidence indicates that EMDR therapy is a viable treatment option for several conditions other than post-traumatic stress disorder.[1] The wide availability of treatment options include pain and neurogenerative disorders.[1] Implementation of EMDR into pain management protocols can benefit patients in the relief of chronic pain, realizing its real-world applications and cost-effectiveness.

PICO Question

The following PICO question guided the project: In patients with chronic pain disorders or at risk for developing chronic pain, would the implementation of eye movement desensitization and reprocessing (EMDR) as adjunctive therapy in pain management protocols be more beneficial than standard pain management protocols in treatment and prevention of patients with chronic pain?

Segmenting the questions presents the population (P) as patients with chronic pain or at risk for developing chronic pain. The intervention (I) utilized standard therapies and EMDR as

an adjunctive therapy in treating chronic pain. The comparison (C) was to standard treatment protocols that utilized physical therapy or medications to provide analgesia and pain relief, and the outcome (O) was the increased benefit and pain relief associated with the implementation of EMDR sessions.

Background

Chronic pain is an unfortunate yet common occurrence as a potential side effect of surgical outcomes. It is traditionally diagnosed based on the time that pain is experienced, which is considered pain persisting past the standard healing time.[2] It is usually diagnosed between 3 to 6 months after onset of symptoms, while almost never considering the specific causative mechanisms or their clinical significance.[2] Without understanding the underlying mechanisms and a proper treatment regimen, analgesic therapies are most likely to fail and prove ineffective, leading to chronic pain.[2]

Chronic pain is a loosely understood subject with biological, psychological, and social factors that lead to its development. It is estimated that about 20% of adults in developed countries have some form of chronic pain development.[2,3] Within the United States, the annual cost of untreated pain is estimated to be between $560 to $635 billion.[3] It is predicted that this statistic will likely increase without proper care and management.[2]

Inappropriately managed pain profoundly impacts a patient's quality of life. Improper pain management leads to physical, psychological, social, and economic consequences if not adequately addressed, which may lead to immunological and neural changes that lead to the development of chronic pain.[3] The common sequelae of chronic pain involves a cascade of disability involving impaired mobility, impaired immune function, difficulty concentrating, disturbed sleep patterns, anorexia, depression, and anxiety.[3] The debilitating effects of chronic

pain not only take a toll on the individual but on their social surroundings as well. Patients socially isolate themselves, become dependent on caregivers, and potentially strain and impair relationships with friends and family.[3]

Pain management itself has shifted towards a multimodal and multidisciplinary approach, utilizing various therapies and medicines to provide analgesia in treating acute pain and preventing the development of chronic pain. If pain persists and becomes chronic, utilization of different therapies can help minimize or eliminate pain. These therapies employ the use of physical, medicinal, and psychological strategies to prevent and treat chronic pain. Examples include using physical or occupational therapy; medical pain management at pain clinics that utilize several techniques, including ketamine infusions, steroid injections, or opioid prescriptions; and psychological treatments such as cognitive behavioral therapy (CBT) and the use of Eye Movement Desensitization and Reprocessing (EMDR).

EMDR is a psychological therapeutic option that became more known in 1989 when it was initially used as a treatment therapy for patients suffering from post-traumatic stress disorder (PTSD).[4] While the treatment modality is initially designed to treat PTSD, it has branched into treating other conditions, such as generalized anxiety, and its use in chronic pain treatment and management is developing more interest. Although the therapy was originally introduced for use in treatment of individuals with psychological trauma, the neurobiological similarities found in patients with PTSD and chronic pain have encouraged the use of EMDR in patients even in the absence of psychological trauma.[5] An example includes the successful use of EMDR for patients who developed phantom limb pain post-amputation, a phenomenon that is associated with up to 50% of patients who undergo amputations.[6]

EMDR is an integrative psychotherapy approach that facilitates the expression of problematic emotional responses that, when done in a controlled fashion, provide conditions for new learning and alleviate or eliminate distressing symptoms.[7] It is based on an adaptive information processing (AIP) model that assumes that past traumatic experiences are implicated in triggering present pathologic symptomatology, inducing flashbacks, nightmares, physical sensations, and chronic pain.[7] The therapy is linked to neurophysiological research related to sensitization processes and limbically augmented pain syndrome, a theory developed by Rome and Rome in 2000, which proposed that repeated exposure to painful stimuli and traumatic experiences can induce a complex series of neuroplastic processes at the corticolimbic levels that transduce information from within the body or the environment into cellular memory. This can augment pain response to future stimuli, even if the stimulus is not painful in nature.[7] When applying EMDR to this theory, it is possible that the treatment desensitizes the limbically augmented portion of the pain experience.[7]

What is the Process?

The process of EMDR begins with thorough assessment and preparation, including identifying and prioritizing incidents and issues requiring reprocessing.[8] EMDR uses a protocol that is split into three sections, where the past incident which leads to the current disturbance is addressed, present circumstances that elicites distress, and future events meant to acquire new stills and attitudes.[8] Identification of past incidents involves identifying a related negative cognition; at the same time, a positive cognition is developed, which expresses a desire for self-attribution. This is then followed by identification of emotions related to the response and value given a units of distress scale.[8] Following identification of the traumatic event, negative cognition and emotional aspects come to the desensitization phase.[8] This phase focuses on the

images, negative cognition, and body sensations while attending short periods of bilateral stimulation known as "sets," which include eye movements, auditory tones, or tapping.[8] With each set, the identification of noticed and new material is focused on in the next set of bilateral stimulation, and this is continued until there is no distress related to the original incident.[8] The next phase uses bilateral stimulation to strengthen the patient's positive cognition in order to replace the original negative self-belief and to consolidate the patient's cognitive insights. This process is repeated until the patient reports high confidence and validation of the positive cognition.[8] After a session is concluded, a body scan is performed and meant to ensure that tension is relieved; any sensations discovered are targeted with more bilateral sets, continued until relieved.[8] In the following sessions, therapists assess patients to ensure that treatment gains are maintained by accessing the previously process targets and assuring that the current emotional, cognitive, and physiological responses remain. The overall goal is to provide the most benefit within the shortest period, maintaining patient function and preventing an emotional overload.[8]

Literature Review

Literature Search Process

The literature search began with an overview of literature databases to include PubMed, Embase, CINAHL, and APA PsycNet. The databases of PubMed, CINAHL, and Embase were selected for their varied degrees of medical articles that deal with pain management and anesthetics. The APA PsycNet database was used due to its association with journals that focus on psychiatry and psychology, which encompasses key components of the use of EMDR. Since the use of EMDR is a relatively newer subject with a limited number of articles, a time period for articles was not included. However, majority of the articles are within the past 5 to 10 years,

exceptions being landmark studies first exploring the use in treating chronic pain, which date back to 2008 at the earliest find. The articles were searched based on the use of EMDR for chronic pain and included randomized controlled trials, case studies, and systematic reviews if available.

The inclusion criteria of articles included the use of EMDR, patients with chronic pain, current treatment for their chronic pain with pain reduction as a prospective outcome of intervention, EMDR as the treatment of primary active treatment or interest, and designed within a well-defined cohort of chronic pain patients. Articles also had to be in English to be included in the review. Although one article does have both English and French in the abstract, the article in its entirety is translated to English.Additionally, inclusion criteria required studies including Randomized Controlled Trials, Non-Randomized Controlled Trialss, case studies, and systematic reviews. Exclusion criteria consisted of articles not in the English language or not related to chronic pain since most articles employed the use of EMDR for post-traumatic stress disorder, depression, and anxiety These databases were selected for their wide variety of articles to choose from and the capability to narrow searches using key words, which included "chronic pain," "Eye Movement desensitization and reprocessing," and "EMDR.. The search yielded 123 articles across the different databases, which were then reduced to 9 articles meeting the full inclusion criteria and barring duplicates.

Literature Appraisal and Literature Matrix

Five articles consisted of randomized controlled trials for the use of EMDR in chronic pain patients with concurrent standard treatment. One article included 3 comparisons, between EMDR, guided imagery, and standard treatment. A nonrandomized controlled trial discussed using EMDR and treatment as usual with patients experiencing chronic pain. A case study

utilized EMDR for treatment of chronic pain, disability, depression and PTSD. This literature review also included two systematic reviews, one that used EMDR in the treatment of chronic pain and the other that reviewed uses of EMDR for treatment modalities other than PTSD, including a sizeable portion related to chronic pain.

Citation	Design/Method	Sample Setting	Major variables studied and their definitions	Measurement and Data Analysis	Findings	Results	Conclusions	Appraisal: Worth to practice/level
Nia NG, et al 2018[9]	Randomized controlled trial utilizing 75 patients with rheumatoid arthritis.[9] Blinding provided to colleagues collecting data regarding pain scores and analyzing data.[9] Using two intervention groups and one control group.[9] One group utilizing EMDR, the second group with Guided imagery and the final group is considered control with treatment as usual.[9]	The sample setting consisted of 75 individuals with rheumatoid arthritis (RA).[9] Inclusion criteria involved a diagnosis of RA with complaints of pain, ability to perform EMDR and guided imagery and willingness to participate.[9] With exclusion criteria consisting of high pain scores, unwillingness to participate, hearing and vision problem, patients immigration or death and unpleasant memories of forest/natural sceneries.[9]	Dependent variables (DV): Pain Scores Independent Variables: Pain management. IV1: EMDR IV2: Guided Imagery IV3: Control – Treatment as usual (TAU) Variables studied consisted of patient pain levels using the RA Pain Scale (RAPS). EMDR variables included a VOC (Validity of Cognition) scale, and subjective units of disturbance (SUD) scales.[9]	Data were analyzed using descriptive and inferential statistics in SPSS.[9] Distribution of pain scores were checked using the Kolmogorov-Smirnov test and a one-way analysis of variance (ANOVA) was utilized for group comparisons.[9]	Both EMDR and guided imagery reduced pain severity in patients with RA but was more significant after EMDR intervention.[9] The findings showed the results from physiological, affective, sensory discriminative, and cognitive domains of pain.[9] The tables showed the increasing values represent a decrease in pain levels according to the scales used[9] with EMDR having the highest reductions.[9]	Results of the study showed that both EMDR and guided imagery had reduced pain scores.[9] EMDR showed significantly more pain reduction than the guided imagery group and the control group.[9] The guided imagery group showed significantly more pain reduction than the control group.[9]	Both EMDR and guided imagery are viable methods to reduce pain in patients with RA.[9] But higher levels of pain reduction following EMDR.[9] With the simple, cost-effectiveness, and non-aggressiveness of these interventions' healthcare workers might consider these interventions once the approval of their effectiveness is provided.[9]	Level II Evidence. Randomized controlled trial with blinding[9] This article provided an ample sample size and provides multiple means of pain management in patients with chronic pain with RA.[9] The technique was simple, cost-effective, and non-aggressive.[9] The disadvantage to the technique was the time needed to take effect, considering there are multiple sessions to be involved.[9] The study suggested limitations of a small sample size, treatments of patients in remission may be lower than in relapse, and non-

								random sampling.[9] Further investigation with a larger sample size and random sampling method was suggested.[9] Overall, it appears as though it is worth continuing research and practicing as it addresses chronic pain.[9]
Maroufi M, et al, 2016[10]	Randomized controlled trial consisting of 56 patients and data collection that was blinding to the collector.[10] Using 2 groups, 1 group with EMDR and 1 group with usual pain control methods and questionnaire.[10]	56 patients total divided into 2 groups.[10] One group utilizing EMDR and 1 control group. Both groups were to use standard pain treatments.[10]	DV1: Pain scores (Wong-Baker Faces Scale)[10] IV1: EMDR and TAU[10]	Data analysis used IBM SPSS Statistics.[10] Comparing baseline pain scores using the Mann-Whitney U-test.[10] Pre- and post-intervention pain scores were compared using the Wilcoxon signed-rank test.[10]	Patients in the control group exhibited higher than average pain scores while the patients in the EMDR group had shown a significant decrease in pain intensity.[10]	The Mann-Whitney test tested different times (Time #1 and time #2) and showed no significant difference between the two groups at time #1.[10] However, it showed a significant difference at time #2 (post-intervention).[10] The Wilcoxon test showed significant differences for the EMDR group for times 1 and 2 but not for the control group.[10]	In this experiment, EMDR was meant to be used as a complementary method in reducing pain in the postoperative period.[10] The results demonstrated that recipients of EMDR experience significantly less pain than control participants post-surgery.[10]	The article would present as level II evidence as a randomized controlled trial.[10] The sample size was small at 56 but was evenly distributed between the two groups.[10] Limitations included the small sample size and inability to detect if pain is reduced due to relaxation or to the use of EMDR and rapid eye movement.[10] This study suggested performing ore research utilizing other techniques including relaxation techniques in order

								to distinguish them.[10] This study promotes the capabilities of EMDR in addressing pain and promotes the continued research and potential practice.[10]
Rostaminejad A, et al, 2017[11]	This study was conducted as a randomized controlled trial on patients that had amputations at the clinical rehabilitation unit experiencing phantom limb pain (PLP).[11]	The patients included are those who received amputations with PLP.[11] With 85 participants enrolled with only 60 after exclusion criteria was applied.[11] Inclusion criteria included at least 4 months of PLP with moderate to severe pain ratings lasting at least 4 days a week.[11] Exclusion criteria include a history of psychological disorders, history or epilepsy, drug addiction, visual disturbances, and strabismus, systemic disease affecting the CNS, lack of cooperation with the therapist and	DV1: Pain scores IV1: EMDR IV2: TAU	Data were gathered during pretest, posttest, and 24-month follow-up.[11] In the experimental and control group and analyzed using SPSS software through descriptive and interreferential statistics test.[11]	The study reported that findings were consistent and in agreement with the results of a previous study in 2007. Showing success in the use of EMDR in treating PLP.[11]	The results showed a significant reduction in pain intensity and after the intervention and during a 24-month follow-up.[11] The patients of the EMDR group exhibited a decreased or eliminated PLP following therapy.[11]	The study concluded the efficacy of EMDR therapy as an efficient and long-lasting treatment option for PLP.[11]	As a randomized controlled trial, the evidence presented as level II. The sample size of 60 participants was small.[11] The only limitations the study explored was an additional follow-up after the 24-month follow-up after amputation.[11] With such a long follow-up and with such reductions in pain for this patient population, it would be worth practicing and conducting continued research for EMDR in chronic pain and phantom limb pain.[11]

		intolerance to the treatment method.[11]						
Abdi N, et al, 2021[12]	A randomized controlled trial consisting of 60 patients with patients suffering from moderate to severe cancer pain.[12] EMDR was given to the experimental group with 1-hour sessions in 6 to 8 sessions followed with a 2-month follow-up.[12] The control group utilized routine treatments for cancer pain.[12]	The sampling criteria used an inclusion criterion of diagnosis of cancer that lasted for at least 6 months, hemodynamic stability, moderate to severe cancer pain lasting at least 4 days a week, literacy, no visual problems, no history of drug abuse, and no psychological disorders. Exclusion criteria included a lack of cooperation with the therapist or unwillingness to cooperate during the implementation.[12]	DV1: Pain scores IV1: EMDR IV2: TAU	Pain measurement scale, SUDS scale, questionnaire of demographics.[12] Data analyzed by chi-square and independent *t*-test.[12] Statistical analysis carried out by using SPSS.[12]	Pain measured pretest for both groups were similar at 9.46 ± 0.73.[4] With posttest intervention being 3.03 ± 1.51 and in the control 8.83 ± 0.98.[12] EMDR follow-up pain was 3.70 ± 1.57 in the EMDR group and 9.7 ± 0.59 in the control group.[12] Similar results with subjective distress with 9.76 ± 0.56 in intervention group and 9.70 ± 0.53 in the control group pretest.[12] Post intervention SUD was 3.26 ± 1.56 in the EMDR group and 9.70 ± 0.59 in the control group.[12] SUD in the follow-up was 4.03 ± 1.62 in EMDR group and 9.86 ± 0.43 in the control group.[12]	The results of the study showed the efficacy of EMDR in cancer patients even after a short time period.[12] This pain reduction was shown to be maintained in a 2-month follow-up.[12]	The results show that EMDR is an effective therapy approach for pain management in cancer patients.[12] The study suggested further research into the use of EMDR in pain management in the oncology setting and other disorders that cause pain.[12]	This study presented as level II evidence being a randomized controlled trial. The study presented the small sample size as a limitation as well as the follow-up time period,[12] where the 2 months was considered minimal and 1 year would have been optimal.[12] The evidence supported the use of EMDR in the management of chronic pain in cancer patients and appears to be a positive benefit in areas where standard treatments cannot be routinely accessed.[12] It promoted the further research into this specific patient population, and the pain experienced by these patients historically has been difficult to treat, and this study has shown it be a significant

								benefit towards these patients.[12]
Mazzola A, et al, 2009[7]	Non-randomized controlled trial investigating the use of EMDR in treatment of chronic pain as an adjunct to their current medication regiment.[7]	50 possible participants of whom only 38 could participate in the study.[7] Exclusion criteria included prior history of mental retardation, substance abuse, and systemic disease affecting the CNS.[7]	DV1: Pain scores DV2: Medication usage IV1: EMDR treatment IV2: TAU	Self-report questionnaires assessing quality of line, pain intensity, and depression level.[7] A short-form health survey containing 36 items that yield 8 domains.[7] State-trait anxiety inventory, Beck depression inventory, Structured clinical interview for diagnostic and statistical manual of mental disorders (DSM).[7] As well as a visual analogue scale.[7]	SF-36 detailed the 8 domains and their median scores.[7] Physical functioning improved from a median score of 80 to 87.5.[7] Role-physical leaped from 0 to 75. General heath from 57 to 64.5 Vitality from 37.5 to 47.5, social functioning 37.5 to 68.7, role-emotional from 33.3 to 100, and mental health from 46 to 60.[7] Pain scores showed the median range of initially 8 drop to 6.[7] Depression from 17 to 9, both trait and general anxiety drop from 65 to 51.5.[7]	Patients treated with EMDR had statistically significant improvement relative to baseline pain scores after 12 weeks of treatment.[7] There was a reduction in the amount of medication consumption of 30 patients.[7] The SF-36 scales all showed significant improvement with role-physical and emotional showing the most improvement.[7] The higher the scores the better from scales of 0-100.[7]	The usefulness of EMDR was investigated in the treatment of these 38 patients over a 12-week period.[7] The present study showed a general decrease in pain and medication intake, as well as quality of life improvements both emotionally and physically.[7] There were not only decreases in pain but also in anxiety and depression following treatment, potentially desensitizing the emotional aspect and allowing a separation of painful somatic perception from emotionally linked memories and allowing a change in the way that pain is perceived and remembered.[7] After treatment a different	This study was not a randomized controlled trial but a nonrandomized quasi experiment, which would present as level III evidence. The limitations of the study included an important lack of follow-up as well as a disparity in the range of chronic pain disorders.[7] Majority consisted of headaches, with others including fibromyalgia and neuropathic pain.[7] The study mentioned future research should assess whether the reduction of physical and psychological symptoms was also associated with a corresponding decrease in diagnosis of personality disorders.[7] Although it is not an RCT, it does provide

							perception and coping with pain was observed.[7]	evidence that EMDR can be beneficial in the treatment of chronic pain.[7]
Suárez NA, et al, 2020[13]	This study states itself as a randomized controlled pilot study consisting of treatment in two groups.[13] Treatment with 12 sessions of EMDR lasting 90 minutes with TAU, or just TAU.[13] Patients were assessed at 2 points in time, before (T0) and after treatment (T1).[13] With an additional 3-month follow-up.[13]	This study included 33 patients, of which 1 patient dropped out and 4 did not appear for post-treatment evaluation. Inclusion criteria consisted of patients aged 18-76 years with a chronic pain diagnosis in accordance to ICD-9CM.[13] With pain scores in range of 3-7.5 on a visual analogue scale.[13] Exclusion criteria consisted of ongoing psychotherapy, pending disability proceedings, history or brain trauma or illness and a history of severe mental illness.[13]	DV1: Pain DV2: Pain disability index DV3: Quality of life. IV: EMDR IV2: TAU	Data collection utilized a visual analogue scale (VAS) for pain, a pain disability index (PDI) and a quality of life EQ-5D-5L descriptive system questionnaire.[13] The study also used a hospital anxiety and depression scale (HADS).[13] Statistical analysis was performed with SPSS software and Mann-Whitney U-test for comparison of pre-treatment clinical scores.[13]	The median pain scores on the VAS were 5 for both groups.[13] EMDR + TAU post treatment decreased to 0.5, while TAU alone only decreased to 2.41.[13] Follow-up with EMDR +TAU showed a median pain score of 2.25.[13] PDI scores in the EMDR + TAU group decreased from 40.5 to 13.[13] The TAU scores went from 39.5 to 37.5.[13] QOL in the EQ systems scores improved from 0.36 to 0.74 in EMDR + TAU.[13] The TAU scores decreased from 0.52 to 0.41.[13]	The results of this study showed that the EMDR + TAU group presented with a significant reduction in pain intensity and significant improvement in anxiety and depressive symptoms, as well as an improvement in quality of life when compared to the TAU group.[13] The TAU group showed no significant differences between T0 and T1.[13] The EMDR + TAU group was also able to maintain scores during a 3-month post-treatment follow-up.[13]	The article concluded that the pilot study was able to suggest that EMDR is a safe and well-tolerated therapy to reduce pain intensity and improve mood states and quality of life in patients with treatment resistant chronic pain.[13]	The level of evidence the article presents is between a level II and III. As it is a pilot study meant to set the groups for a larger future randomized controlled trial. One limitation of the study was that the psychologist giving the EMDR treatment was not blinded to the study, but the scores were self-applied by the patients so they should not have an effect or bias on the outcome.[13] The second limitation was the nature of the study itself as a pilot study with a smaller population size.[13] The third limitation was that only the EMDR + TAU group was seen for a follow-up.[13] The fourth limitation

								given was that there was no registration provided, but it was approved by the hospital's ethics committee.[13] The final limitation was the differences in patient treatment for the TAU for chronic pain.[13] The study shows promise for a larger RCT. Even with the limitations presented it is still applicable for clinical use regarding its effectiveness in treating chronic pain.
Schneider J, et al, 2007[6]	This article is a review of case studies involving 5 patients being treated with EMDR over a course of 3-15 sessions.[6]	The sample size includes 5 patients selected for EMDR use.[6]	DV1: Pain[6] DV2: IES[6] DV3: BDI.[6] IV: EMDR[6]	Data were collected using the Impact of events scale (IES), The Beck Depression Inventory (BDI) and Faces pain scale to identify pain level.[6]	Average IES was 54 pre-treatment and lowered to 15.2 post-treatment.[6] Pre-treatment BDI was 21.2 and dropped to 11.5.[6] Pain averaged 9.5 and dropped to 2.8.[6]	All patients experienced reductions in all scales.[6] Although most experienced residual nociceptive pain, the overall pain levels were easier to manage.[6]	The article concluded that EMDR is capable of relieving pain, with a potential for long-term pain control of the phantom limb pain.[6]	The article presents as level VI evidence. Analyzing 5 different case studies that evaluate the use of EMDR for treatment of phantom limb pain in 5 different case studies.[6] The review offered no limitations.[6] However, it can be seen that the limited samples sizes within the case studies

								offered limitations and bias.[6] It would be worth seeing its efficacy in larger trials.[6]
de Roos C, et al, 2010[14]	A case study utilizing 10 patients with phantom limb pain. Utilizing a trauma-focused psychological approach on the treatment of PLP using a standardized EMDR pain protocol.[14]	This study utilized 10 participants with inclusion criteria of a history of PLP for 12-months for at least 5 days a week.[14] Exclusion from the study if participants a psychiatric disorder was diagnosed and immediate treatment was necessary.[14]	DV1: Pain DV2: Psychological distress DV3: Fatigue DV4: PTSD DV5: Health related quality of life IV1: EMDR	Pain was measured using a numerical rating scale.[14] Psychological distress by the symptom checklist 90.[14] Checklist individual strength for fatigue.[14] Impact of events scale to determine levels of PTSD.[14] A short form health survey to evaluate quality of life.[14]	The findings of the study showed pretest pain scales of 5.0 ± 1.7, to post-test scales of 2.8 ± 2.6.[14] Psychological distress totals of 129 ± 26.4 mean values to 1.6.4 ± 8.7 posttest.[14] Fatigue mean totals of 68.8 ± 18.9 to 48.5 ± 21.1 posttest.[14] PTSD (IES) mean scores 15.9 ± 17.9 to 3.5 ± 3.9 posttest.[14] Quality of life (SF-36) scores in each of the eight domains, Physical functioning, Social functioning, Role physical, Role emotional, Mental health, Vitality, Bodily pain, General health, all showed improvements.[14]	The results showed that there was a significant decrease in pain scores, which maintained in follow-ups.[14] Although two participants did not improve.[14] Four participants experienced pain relief but not full relief, and four experienced no pain in follow-up.[14]	The preliminary results suggest that the approach of using a psychological intervention focused on trauma and pain memories can provide substantial reduction of chronic PLP.[14] But admits that larger studies are needed.[14]	This article can be seen as a nonrandomized trial or quasi-experiment. The study listed limitations being the small sample size[14] as well as the absence of a control group.[14] There lies feasibility, especially in the long-term effects of the treatment and the need for further future randomized controlled trials from the time of the study.[14]

Tesarz J, et al, 2014[5]	This study was a systematic review consisting of 12 studies regarding pain, 5 studies with disability, 8 studies regarding depression and 5 studies with anxiety.[5]	The systematic review regarding pain consisted of 12 articles, including two randomized controlled trials for pain that consisted of 80 patients total, the observational studies included 116 patients. Two studies included phantom limb pain and chronic headache.[5] There was also a mix of chronic pain patients including fibromyalgia headaches and neuropathic pain.[5]	DV1: Pain and pain intensity DV2: Disability DV3: Depression DV4: Anxiety	The systematic review provided a breakdown relating to the effects of pain pre and post treatment with EMDR.[5] The numerical evaluation included RCTs and observational studies.[5] The studies used a mixture of a visual assessment scale (VAS), numerical rating scale (NRS), a subjective units of discomfort scale (SUD), and the short form mcgill melzack pain questionnaire (SFMPQ).[5]	The findings of the studies were all listed next to each respective study with the RCTs showing a reduced or eliminated migraine pain and significant improvement over standard care medications.[5] The observational studies all showed significant reductions in pain, anxiety, and disability regarding their chronic pain.[5]	The results of the RCTs showed significant reductions in pain intensity as compared to standard medication treatments.[5] The observational studies also showed varying degrees of reduction in pain.[5] However, the amount of pain reduced depended on the underlying pain condition and the length of treatment.[5] The most positive effects were seen with phantom limb pain, headache, and chronic musculoskeletal pain.[5] Some findings also reported complete pain relief of their patients of up to 15%-40% of patient sample sizes despite the	The systematic review stated that EMDR may be a safe and promising treatment option for chronic pain conditions.[5]	As a systematic review compiling the evidence generated from randomized controlled trials and observational studies, the level of evidence would be seen as level I. Limitations included a limited body of evidence at the time the systematic review was conducted, with a potentially high risk of bias, warranting further studies.[5] The article posed successful insight into the positive outcomes of EMDR. With numerous successful RCTs produced since the publication of this systematic review it produces further evidence that EMDR is a successful treatment option for chronic pain depending on the underlying mechanisms, such as in the case of phantom limb pain.

						longstanding history of treatment resistant pain in these patient populations.[5]		

Characteristics of the Included Studies

The Nia et al study, "Comparing the effect of eye movement desensitization and reprocessing (EMDR) with guided imagery on patients with rheumatoid arthritis,"[9] was a randomized controlled trial (RCT) that used 75 patients split into three groups.[9] Each group continued the patients' standardized treatment regimen or treatment as usual (TAU), with one group acting as the control group only utilizing TAU.[9] The other two groups are split between EMDR and guided imagery, where they will concurrently receive TAU.[9] The study focused on dependent variables of pain and independent variables of pain treatment modalities.[9] The overall outcome of this study was the significant pain reduction associated with EMDR over guided imagery and TAU.[9] Guided imagery also provided more pain relief compared to standard TAU.[9] Both EMDR and guided imagery are viable methods to reduce pain in patients with RA,[9] but patients experienced higher levels of pain reduction following EMDR.[9] With the simple cost-effectiveness and non-aggressiveness of these interventions, healthcare workers might consider these interventions once the approval of their effectiveness is provided.[9] The disadvantage was the time needed to take effect, considering multiple sessions are needed. Limitations of the study were a limited sample size, treatments of patients in remission may be lower than in relapse, and a non-randomized sample.[9]

The Maroufi et al study, "Effects of eye movement desensitization and reprocessing (EMDR) on postoperative pain intensity in adolescents undergoing surgery,"[10] was somewhat different in reference to pain. This article was not in relation specifically to chronic pain but rather acute pain after surgery, which can exemplify the benefit provided by EMDR if successful.[10] The study was an RCT that placed 56 patients into 2 groups, 1 group utilizing

EMDR and a post-surgical 60-minute session and a control group with TAU.[10] The outcomes of this study showed that EMDR provided greater pain reduction in comparison to TAU in the postoperative period by evaluating what the preintervention and postintervention scores were.[10] The greater focus of this paper was on the relief of chronic pain, and this study showed the alleviation of rather acute post-surgical pain, which can have effects in a longer period of time where chronic pain can develop, showing promise.[10] The article concluded that in the experiment, EMDR is meant to be used as a complementary method of reducing pain in the postoperative period.[10] The results demonstrated that recipients of EMDR experienced significantly less pain than the control group post-surgically.[10] The limitations of the study were stated as a limited sample size and inability to detect if pain was reduced due to the relaxation, or the effects of EMDR.[2] This prompted the suggestion for a study using other relaxation techniques to help distinguish its effectiveness for the treatment of chronic pain.[2]

The Rostaminejad et al study, "The efficacy of eye movement desensitization and reprocessing on the phantom limb pan of patients with amputations within a 24-month follow-up",[11] was an RCT that evaluated 85 patients split into 2 groups.[11] The study focused on patients with phantom limb pain (PLP), splitting 60 patients between 2 groups: an EMDR group with TAU and a TAU group.[11] After treatment, patients were given a 24-month follow-up to evaluate their pain levels and intensity.[11] The results of the study showed a significant pain reduction in patients in the EMDR group compared to the TAU group.[11] The EMDR group had lasting pain reduction in the 24-month follow-up with decreased or eliminated pain levels.[11] A simple conclusion from this study was the long-lasting effect of EMDR as a treatment option in PLP.[11] The study listed limitations as a small sample size and the lack of a secondary follow-up[11]

The Abdi et al study, "Efficacy of EMDR Therapy on the pain intensity and subjective distress of cancer patients,"[12] was an RCT that followed 60 patients suffering from moderate to severe cancer pain using 6 to 8 sessions of EMDR and a 2-month follow-up.[12] The study followed 2 groups with an EMDR group coupled with TAU and a TAU group solely.[12] The researchers measured pain scores pre- and post-intervention for both groups and during the 2-month follow-up.[12] The EMDR group showed an effective treatment for patients over the TAU group that was consistent at the 2-month follow-up.[12] The results show that EMDR is an effective therapy approach for pain management in cancer patients.[12] The study suggested further research into the use of EMDR in pain management in the oncological setting and other pain disorders.[12] The limitations of the study included a small sample size and a limited follow-up period of only 2 months, which is considered minimal, whereas a year would have been optimal.[12]

The Mazzola et al study, "EMDR in the treatment of chronic pain,"[7] utilized a nonrandomized controlled trial (nRCT) format that investigated the use of EMDR in treatment of chronic pain as an adjunct to patient's current treatment regimen.[7] The study followed 38 patients in 2 separate groups, EMDR and TAU and TAU. Measurements were based on pain scores and medication usage over the course of treatment.[7] The outcome of the study showed a significant improvement from baseline in the EMDR group compared to the TAU group,[7] with decreases in pain scores and improvements in quality of life physically and emotionally.[7] The reduction in pain scores showed a concurrent reduction in medication usage compared to the TAU group[7] along with a general decrease in pain, medication intake, and quality of life improvements that are both physical and emotional.[7] Anxiety and depression were reduced following treatment, which potentially desensitized the emotional aspect, allowed for a

separation of painful somatic perception from emotionally linked memories, and allowed for a change in the way that pain is perceived and remembered.[7] Limitations included an important lack of follow-up and a recognized disparity across different pain disorder patients, with the bulk of patients suffering from headaches, fibromyalgia, and neuropathic pain.[7] Although it was not an RCT, this study provided valuable insight and evidence towards the effectiveness that EMDR provides in these patients.

The Suarez et al study, "EMDR versus treatment-as-usual in patients with chronic non-malignant pain,"[13] was an RCT comparing the 2 independent variables and their outcomes. The sample size consisted of 32 patients receiving 12 sessions of EMDR lasting 90 minutes each, and another group with only TAU.[13] The study measured pain levels as well as disability and quality of life.[13] The measurements were taken at 2 different time points, preintervention and postintervention.[13] The results showed a general decrease in pain intensity, and a significant improvement in anxiety, mood, and quality of life with treatment resistant chronic pain.[13] The article concludes that the study was able to suggest that EMDR was a safe and well-tolerated therapy to reduce pain intensity and improve mood states and quality of life in patients with treatment resistant chronic pain.[13] The limitations included a lack of blinding towards the psychologists administering the therapy, which may increase bias, although the scores were self-applied by the patients, which should not have an effect on the outcome. The second limitation was a small population size and only the EMDR with TAU group were seen with follow-up. Other limitations were the difference in patient management and pain treatment in the TAU-only group.[6]

The Schneider et al study, "EMDR in the treatment of phantom limb pain,"[6] was a review of 5 case studies where EMDR was utilized for the treatment of PLP.[6] The 5 case studies all

consisted of the same diagnosis of post-amputation PLP, monitoring values of pain, trauma, and depression pre and post-intervention.[6] All patients experienced reductions in all scales; although some patients still had some residual PLP, they regarded it as manageable.[6] The study concluded that EMDR is capable of relieving pain, with a potential for long-term relief in patients with PLP.[6] Although the study provided no limitations, the sample size was limited, but the study provides valuable insight for larger prospective studies.[6]

The De Roos et al article entitled "Treatment of chronic phantom limb pain using a trauma-focused psychological approach,"[14] was a case study following 10 different patients with PLP utilizing EMDR as a pain management protocol.[14] The study's inclusion criteria for PLP necessitated patients having at least 12 months of PLP for at least 5 days of the week.[14] The measurements that the case recorded were pain, psychological distress, fatigue, and PTSD.[14] The study used a number of different scales to include pain rating scales, symptoms checklists, and individual checklists for strength and fatigue.[14] The overall outcome showed a significant decrease in pain scores that maintained during patient follow-ups.[14] The results yielded 2 patients with no improvement, 4 participants with pain relief with some residual pain, and 4 more participants with complete elimination of pain.[14] The study's limitations included the absence of a control group and a small sample size.[14]

The Tesarz et al study, "Effects of eye movement desensitization and reprocessing (EMDR) treatment in chronic pain patients: A systematic review,"[5] was a systematic review that encompassed about 12 different articles that represented the use of EMDR in chronic pain.[5] The breakdown of the article included 2 randomized controlled trials with 80 patients total that evaluated EMDR and TAU.[5] The remaining studies were observational studies and case studies that documented the use of EMDR treating chronic pain in about 116 patients total.[5] It provided

a breakdown relating to the effects of pain pre and post-intervention with EMDR, with numerical evaluation including the data provided from RCTs, observation, and case studies.[5] Various pain assessment scales, to include visual analogue scales (VAS), numerical rating scale (NRS), Short Form McGill-Melzack Pain Questionnaire (SFMPQ), and a subjective units of disturbance scale (SUDS).[5] The systematic review determined that significant pain reduction in intensity occurs in comparison to standard treatments in the RCTs.[5] The observational and case studies showed varying degrees of reduction in pain, which concluded that the amount of pain reduced was dependent on the pain condition and the length of the treatment.[5] The most positive effects were seen in PLP, headache, and chronic musculoskeletal pain.[5] Some areas showed complete pain relief in up to 15% to 40% of patients with longstanding treatment-resistant pain.[5] Limitations included a limited body of evidence at the time of the review. However, the article presented numerous successful RCTs with positive outcomes using EMDR, providing evidence for its application in chronic pain management.

Use in Pain Management

The first mentioned use of EMDR was for patients with post-traumatic stress disorder (PTSD), and it was used to desensitize and disassociate events that trigger patients' PTSD. This same theory has then been applied to chronic pain in several different scenarios. The overarching theme of these articles represented the efficacious use of EMDR in patients with chronic pain. One article represented EMDR in the use of postoperative surgical pain effectively in adolescents, which shows promise as being an effective method of pain management overall. Coupled with findings in other articles, it is best used in the management of chronic pain syndromes such as PLP, rheumatoid arthritis, and chronic migraines or headaches. When coupled with standard treatments or treatment as usual (TAU), the use of EMDR becomes

increasingly beneficial for the treatment of chronic pain. The treatment becomes exceedingly beneficial if it can eliminate the pain.[5,14]

Phantom Limb Pain (PLP)

When used in patients with phantom limb pain (PLP), the results are shown to be overwhelmingly positive. The treatment process provides long-term pain relief and can eliminate the pain in some circumstances, whereas in others, it becomes manageable, improving quality of life.[5] Tesarz et al provided a systematic review with a positive outlook when applied to patients with PLP with potential for complete elimination of the pain in up to 15% to 40% of patients that undergo treatment.[5] Rostaminejad et al targeted phantom limb pain in a randomized controlled trial following 85 patients with a 24-month follow-up.[11] The article provided evidence for concomitant treatment of EMDR and TAU to be beneficial to alleviate and potentially eliminate chronic pain in these patients.[11] De Roos et al provided case studies in 10 different patients that suffered from PLP. These patients were treated with EMDR between 3 to 10 different sessions, with 8 of the 10 participants experiencing pain relief.[14]

Other Treatments for Chronic Pain

Other treatments of chronic pain include the use of EMDR for the management of rheumatoid arthritis, migraine headaches, fibromyalgia, and neuropathic pain.[5,7] Nia et al conducted a randomized controlled trial on the use of EMDR on patients with rheumatoid arthritis.[9] The study compared TAU, EMDR, and guided imagery.[9] With the data provided, the most positive benefit came from EMDR among the 3 groups.[9] Another interesting RCT by Abdi et al included the use of EMDR for the treatment and management of chronic pain from cancerous sources with positive effects.[12] This study had shown promise even after a short 2-month follow-up.[12] In the study, it was revealed that pain gradually increased over time but had

still been significantly lower than the pre-intervention levels that had been taken at the start of the study. The gradual increase in pain in the post-intervention baseline during the follow-up can be attributed to tumor progression.[12] This provides a new avenue for pain management in this patient population while they undergo treatment for cancer, as cancer pain can be exceedingly difficult to control. The Tesarz et al systematic review for EMDR in the treatment of chronic pain identified the best candidates as patients with PLP, headache, and chronic musculoskeletal pain, as well as data providing a 15% to 40% complete elimination of pain in patients treated with EMDR.[5]

Literature Review Conclusion

According to the literature, EMDR requires multiple sessions that range from either 5 weeks up to 12 and a duration between 45 to 90 minutes. The treatment duration depends on the therapist and the patient. Provided the evidence given, it can be determined that EMDR is a safe and effective treatment in different etiologies of chronic pain, with the most relief in phantom limb pain, rheumatoid arthritis, headaches, migraines, and neuropathic pain when treated with EMDR. With the positive results and the likelihood that the pain will cease in 15% to 40% of patients or with a reduction pain that has lasting effects, EMDR can be seen as a viable option for patients with treatment-resistant chronic pain and chronic pain in general.

DNP Project Goal

The purpose of this paper was to provide a teaching module on the benefit of EMDR as a treatment option for patients experiencing chronic pain and treatment-resistant chronic pain. This patient population often receives extensive medical mismanagement.[8] This mismanagement can often exacerbate the patients' pain, cause emotional distress, and potentially result in patient disability.[8] The primary goal was to improve the knowledge of anesthesia providers, specifically

certified registered nurse anesthetists (CRNAs) on the implementation of EMDR as part of a chronic pain management protocol.

Objectives included highlighting the pain reduction, reduction in medication consumption, long-term benefits, and the variety of patients that can benefit. With increasing knowledge on the use of EMDR, it may be beneficial in several different settings. These settings include postoperative pain management for patients experiencing chronic pain, outpatient pain management clinics, or as a potential for inpatient services for providers having difficulty managing chronic pain in the inpatient setting. The efficacy of EMDR can help treat chronic pain and, in turn, reduce medication consumption, including the use of opioids or with unnecessary procedures that may cause more detriment to the patients' health and wellpr-being than benefit.

SMART Goals and Outcomes

Specific

CRNAs were able to understand the evidenced-based interventions for EMDR for patients experiencing chronic pain as part of a multidisciplinary approach with conventional pain management therapies.

Measurable

Effectiveness of the intervention was measured by analysis of a questionnaire provided to participants before and after the educational module. Questions consisted of knowledge of EMDR, the pain theory behind EMDR, debilitating effects of chronic pain, and duration of treatments. The goal was to improve knowledge after the educational module as compared to before.

Achievable

CRNAs possessed the knowledge needed to collaborate and work with the interdisciplinary team to develop guidelines for the management of patients with chronic pain syndromes and utilizing EMDR as a potential implementation in the guideline.

Realistic

CRNAs were educated on the advantages of using EMDR for chronic pain management. The educational module allowed an opportunity for CRNAs to view EMDR as a viable treatment option for pain management. The application of the educational module and a presentation, even if many CRNAs were not present, still offered information for later viewing regardless of time or schedule.

Timely

The outcome of the initiative and educational module would be increasing providers' knowledge base of EMDR and providing exposure to the treatment option and development of guidelines for chronic pain management to include EMDR therapy. Providing a questionnaire after the educational module and evaluating it for an increase in knowledge regarding EMDR and chronic pain would be most efficient.

Program Structure

Successful outcomes for the use of EMDR in chronic pain would require an understanding of the process of chronic pain and an understanding of pain theories. Analysis of this module's strengths, weaknesses, opportunities, and threats would be utilized to evaluate the characteristics of its development. An ideal starting point would be to use questionnaires for the medical facilities stakeholders on their knowledge pertaining to chronic pain, pain theories, disability and cost, EMDR, and what uses EMDR can have. Engagement with stakeholders is

increasingly common as investigators, journal editors, and funders are able to recognize the influence that can be produced, particularly in advancement in policy.[15] The policy to be implemented in this case is using EMDR as an adjunctive treatment option. Stakeholders are individuals who are responsible for or affected by healthcare and healthcare-related decisions.[15] Stakeholders include a variety of people, that include patients, clinicians, and policy makers and insurers.[15] The educational module was the intervention for providers and clinicians used to enhance knowledge in regard to chronic pain, its persistence and debilitating factors, identifying patients who are at risk for its development, and how EMDR can be of benefit towards these patients. After the educational module, a post-intervention questionnaire was utilized, with the majority of the same questions along with a field to depict what additional content or application was learned.

Strengths

The strength of this project lied within a growing body of evidence that distinguishes EMDRs improved outcomes as a versatile therapeutic adjunct. Decreasing the severity of chronic pain or potentially eliminating it can drastically improve patients' quality of life and reduce the number of medications. This results in lower costs and increased patient satisfaction.

Weaknesses

A major weakness of this therapy is the limit body of evidence. Although EMDR is a proven method of treatment for patients that suffer from PTSD, the body of evidence for its use in chronic pain is admittedly small but growing. Another weakness lies in the time for the treatment to take effect, which varies from individual to individual. Different articles present different timelines for the treatment to take effect, with some as short as four or five sessions,

with others lasting up to 12. These discrepancies can make it difficult to produce an adequate timeline for effective treatment.

Opportunities

Opportunities included the enhancement in education for providers in the subjects of chronic pain and EMDR. The implementation of a chronic pain management protocol can be advantageous for patients who have been suffering from this pain long-term. The opportunity to decrease pain severity or eliminate it is not something typically overlooked. It improves long-term outcomes for these patients, improving quality of life and disability. Another opportunity lied within the opportunity for interdisciplinary care. Communication between treatment teams allows for better patient care and can identify who would be a candidate and who would benefit from the treatment. Either in inpatient or outpatient settings, treatment would continue as usual with the added benefit of the adjunct treatment, allowing this multidisciplinary approach to improve patient care and satisfaction.

Threats

A potential threat would be simply provider pushback, occurring when doubt the effectiveness of the treatment despite evidence. Providers may also be reluctant to change practice, utilize new techniques, or refer to another discipline for treatment. Another threat would be patient compliance and follow-up. Lack of follow-up with treatments would not allow for adequate treatment and would result in questionable results towards treatment effectiveness.

Organizational Factors

Being a treatment modality that involves multiple healthcare disciplines, treatment would require input for various teams to help determine its effectiveness from an organizational standpoint. These patients are not specifically encountered only in the anesthetic setting or in

pain management clinics but rather in all facets of healthcare. More providers applying input can help allocate support and planning for the endeavor. The increased awareness across disciplines would amount to an increased success chance for its implementation. This would create a long-lasting reduction in pain severity or a potential to eliminate pain exists promotes the success of its implementation. The organization would have to assess pre- and post-intervention markers regarding pain, disability, and quality of life for these patients. The results of which would provide feedback for improvement and continued success and treatment for positive patient outcomes.

Theoretical Framework

Theories provide a framework for disciplines to apply their research and studies. The use of nursing theory, specifically middle-range theories, tend to be more focused and offer greater connection to theory and practice. The middle-range theory that applies to the intervention is the theory of a balance between analgesia and side effects.[16] The theory presents the perspective that the best pain management practice is one that is integrated in combining analgesic medications with non-pharmacological adjuvants, careful nursing care, and patient participation.[16] The goal of the theory is to provide greater pain relief with fewer side effects by using these principles.[16] Additionally, pain reduction comes with a reduction in medication consumption, which would fulfil the goal of reducing side effects while also improving quality of life.

DNP Project Proposal and Methodology for Proposal

The project was presented as an educational module for the use of EMDR in treatment of patients with chronic pain. The patient population targeted by the educational module would include patients with chronic pain from numerous sources, to include amputees experiencing

phantom limb pain, rheumatoid arthritis, chronic back pain, and chronic headaches and migraines.

Setting and Participants

The educational module was geared towards healthcare professionals, particularly CRNAs. These providers were selected because they are likely to encounter these patients in the hospital setting or at pain management clinics. The educational module was established and created for the healthcare providers' convenience as an online module to ensure that more providers were able to see and learn from it. Increasing awareness and improving education on EMDR can improve healthcare practice and increase positive patient outcomes and patient satisfaction.

Approach and Project Procedures

The project required approval by Florida International University (FIU) faculty and the Institutional Review Board (IRB) to be able to launch the project. This ensured proper ethics and rights were maintained during the project. Once approval was received, CRNAs were be recruited via e-mail to participate in the project. These participants were then given questionnaires regarding their knowledge of chronic pain, pain theories, the effects of chronic pain, EMDR, how EMDR is conducted, and how it can be used as an adjunct in the management of chronic pain. These questionnaires remained anonymous for the providers' discretion. After the questionnaires were completed, the educational module followed. After completion of the educational module, the same questionnaire was given. This provided a data collection point for the post-intervention assessment. Then, the two data points were analyzed and compared for effectiveness of the educational module.

Protection of Human Subjects

The protection of human subjects is paramount in any study, ensuring the rights and safety are maintained. The participation in the educational module remained voluntary and participants remained anonymous. Being an educational module, aside from participant demographics such as gender, profession, years of service and specialty, there was no austere physical participation that impaired safety. Participants were informed that the data collected would be present as part of an analysis at the end of the project.

Data Collection

Data were collected via an electronic system, specifically one used by FIU regularly such as a Qualtrics system to handle the informational system that was used. The data collected were compared from pre- and post-intervention questionnaires. Additional informational demographics can be included such as ages, gender, healthcare profession, and years of service.

Data Management and Analysis Plan

Data analysis was conducted manually and with use of the electronic system that can store the data and also analyze it with concurrent manual analysis. The data were stored within the electronic system and only be available towards the creator of the questionnaire and the FIU faculty overseeing the DNP project.

Timeline

This project took place over 5 months, including 2 months spent researching and reviewing the literature and application of EMDR. The following 2 months consisted of developing and fine tuning the educational module PowerPoint and questionnaire. One month was spent gaining approval from the FIU faculty and the IRB. Finally, a two day analysis of the pre-and post-intervention questionnaires to see if there's increased awareness of the educational model and support of EMDR with conventional therapy as a treatment avenue for chronic pain.

At the end of the survey, it became apparent that awareness of eye movement desensitization and reprocessing (EMDR) increased.

After approval and review by FIU and FIU's IRB, the questionnaire was delivered to participants via e-mail. After the educational module was conducted and reviewed with pre- and post-intervention results, the data and demographics were collected and stored. After review of pre- and post-intervention results, the educational module may provide help in relation to pain theories and a new treatment avenue for chronic pain. The educational module was given via a Qualtrics survey to the personal e-mails of a predetermined group of individuals at Envisions Memorial Regional Hospital's anesthesia team. After 8 weeks of the survey being available, a total of 10 participants had been reached. Then, the results were compared between pretest and posttest surveys to determine if learning occurred as a result of the educational module.

Results

Demographics

All 10 surveyors consented to the survey, with 5 male and 5 female participants. Ages of participants varied, with 5 between 25-35 years of age, 4 between the ages of 36-45, and 1 participant 56 and older. Ethnicities included the following: 4 Hispanic, 5 Caucasian, and 1 Asian individual. All participants were CRNAs, with 1 having a master's degree and 9 having a DNP. Years of experience varied with 4 participants having 1-2 years' experience, 2 with 3-5 years, 3 with 6-10, and one individual with over 10 years of experience.

Pretest knowledge of EMDR

Ten questions were used for the pre and posttest, with the same questions used in both tests to determine efficacy of the educational module. Each participant had fully answered all questions on the pretest questionnaire. Pretest question #1 indicated that majority of participants

did not know what EMDR was or entailed, with 76.66% answering correctly, but some test takers listing incorrect answers such as acute active pain and current active substance abuse as answers, representing 23.34% of the five answer choices in the select 3 question. Question #2 only showed 30% choosing the correct answer for the pain theory that EMDR utilizes. Question #3 was a true or false question with 90% answering correctly. Question #4 which was also a true or false question with 70% answering correctly. Question #5 asked the current gold standards for managing chronic pain, which only 31.82% of test takers were able to answer correctly. Question #6 held 70% correct answers identifying how many sessions are needed to establish pain management. Question #7 had 80% correctly able to answer when chronic pain manifests. Question #8 only 30% of test takers were able to correctly answer that EMDR cannot be used as the sole treatment option in managing chronic pain. Question #9 only 30% were able to answer correctly how many patients develop chronic pain in developed countries. Question #10 asked about the benefits of EMDR with 100% answering correctly.

Post-test knowledge of EMDR

Following completion of the educational module, a post-test survey had been given to test takers. One individual has been noted to not have taken the post-test, as the answers list 9 respondents compared to the pre-tests 10. The post-test questionnaire contained the same questions as the pre-test questionnaire to evaluate effectiveness of the educational module. In question #1 96.30% answering correctly, an improvement from 76.66%. In question #2 88.89% answered correctly, an improvement from 30% in the pre-test. In question #3 100% of test-takers answered correctly, up from 90% from the pre-test. In question #4 100% answered correctly, up from 90% in the pre-test. In question #5 94.44% answered correctly, compared to 31.82% in the pre-test. In question #6 the test takers answered 100% correctly, up from 70%. Question #7 also

showed 100% correctly answering, Question #8 answered with 90% answering correctly, with one individual choosing neither true nor false, up from 30% in the pre-test. Question #9 also showed 100% answering correctly, up from 30% in the pre-test. Question #10 had shown no changes with all test-takers answering 100%.

Discussion

Of the 10 questions analyzed for accuracy, 5 of the questions had presented with significant change in the answer choices. The remaining 5 answer choices showed little deviation from the original answer set and had already been presented with the correct answer. This will suggest that learning had occurred within the 5 questions that showed a significant change within the answer choices. The remaining 5 questions that had not shown a significant deviation had shown that a majority of participants had selected the correct question to begin with. The educational module can be said to have raised awareness and provided education on EMDR as an adjunctive treatment option in chronic pain patients.

The strengths that this project presents included the anonymity provided for the healthcare providers to complete the educational module along with the ability to do so at their own convenience from their personal electronic devices such as a laptop, desktop, or handheld personal phone. The schedule of the healthcare providers does not allow a set time for the completion of the educational module, which is why it was available for a long duration to allow the providers to complete the module at their convenience. Weakness of the project include the capability of participants to skip the educational module and click forward through the pre and post-tests, which may skew results. Another weakness is the accountability that all participants would complete both the pre and post-test questionnaire, which is exampled by one participant not partaking within the post-test.

Limitations

Some limitations that could arise from this project was the fact that a participant can blindly click through the educational module and complete it, which would affect the posttest results on whether the educational module had been effective. In effort to minimize this, the educational module was set to force the participant to answer questions prior to moving on the to the next question, and the posttest was not available until after completion of the educational module provided via a 10-minute video. The other limitation would be the participant clicked on the video, did not view it, and proceeded to the posttest. Another limitation would be not having the full amount of participants within the post-test, as the pretest contained 10 full responses for each question and the post-test with 9 for each question.

Implications for Nursing Practice

The results of this project indicated that learning had occurred in regard to the use of Eye Movement Desensitization and Reprocessing (EMDR) as an adjunctive treatment option in the settings of patients with chronic pain. The title of the project was to provide a distinction that the treatment does not necessarily need to be provided by the anesthesia provider or primary healthcare provider but rather by an individual that is trained in the psychotherapy technique. It also does not preclude or limit these providers from learning and doing so themselves. The results of this project show an increase in the knowledge base of providers regarding EMDR and it capability as an adjunct in chronic pain. This would ultimately lead to an increase use as an adjunct for chronic pain, a reduction in pain levels, in increase in patient satisfaction and overall well-being, as well as a reduction in medication consumption, to include a reduction in opioid usage.

Conclusion

The results of this project indicate that learning occurred regarding the use of EMDR as an adjunct for chronic pain management. The results also suggest an increase in awareness of EMDR as a whole, as a potential treatment option for a wide variety of disorders, with focus on chronic pain and how it is achieved. Literature has shown the provided reduction in pain would come with not only a reduction in medication consumption and administration but with the potential to eliminate the pain altogether in 15%-40% of patients.[5] Pain management is not the only benefit of this treatment; it can also improve the quality of life in these patients. The literature has provided sources for the background of the technique, the pain theory linked to why the therapy works for patients with chronic pain, the methods in which it is deployed, and finally the potential timelines that are variable and patient dependent. The literature provides solid evidence that the treatment is efficacious in a wide variety of chronic pain patients, while exhibiting the most positive responses in patients experiencing chronic phantom limb pain.

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Appendix A: Letter of Support

Dr. Vicente Gonzalez, DNP, CRNA, APRN
Clinical Assistant Professor
Department of Nurse Anesthesiology
Florida International University

Dr. Vicente Gonzalez,

Thank you for inviting Envision to participate in the Doctor of Nursing Practice (DNP) project conducted by Seth Muller entitled "A teaching module on the use of EMDR as part of a multidisciplinary treatment regimen for patients with chronic pain disorders". In the Nicole Wertheim College of Nursing and Health Sciences, Department of Nurse Anesthesiology at Florida International University. I have granted the student permission to conduct the project using our providers.

Evidence-based practice's primary aim is to yield the best outcomes for patients by selecting interventions supported by the evidence. This proposed quality improvement project seeks to utilize the latest literature to increase providers awareness towards Eye Movement Desensitization and Reprocessing as an adjunct to treating chronic pain.

We understand that participation in the study is voluntary and carries no overt risk. All Anesthesiology providers are free to participate or withdraw from the study at any time. The educational intervention will be conveyed by a 15-minute virtual PowerPoint presentation, with a pretest and posttest questionnaire delivered by a URL link electronically via Qualtrics, an online survey product. Responses to pretest and posttest surveys are not linked to any participant. The collected information is reported as an aggregate, and there is no monetary compensation for participation. All collected material will be kept confidential, stored in a password encrypted digital cloud, and only be accessible to the investigators of this study: Seth Muller and Dr. Vicente Gonzalez.

Once the Institutional Review Board's approval is achieved, this scholarly project's execution will occur over two weeks. Seth Muller will behave professionally, follow standards of care, and not impede hospital performance. We support the participation of our Anesthesiology providers in this project and look forward to working with you.

DAN BRADY, DNP, CRNA, APRN

Chief Nurse Anesthetist

Memorial Regional Hospital

Appendix B: FIU IRB Approval letter

FLORIDA INTERNATIONAL UNIVERSITY

√Office of Research Integrity
Research Compliance, MARC 430

MEMORANDUM

KMW

To: Dr. Vicente Gonzalez

CC: Seth Muller

From: Kourtney Wilson, MS, IRB Coordinator

Date: February 23, 2024

Protocol Title: "A teaching module on the use of EMDR as part of a multidisciplinary treatment regimen for patients with chronic pain disorders"

The Florida International University Office of Research Integrity has reviewed your research study for the use of human subjects and deemed it Exempt via the **Exempt Review** process.

IRB Protocol Exemption #: IRB-24-0074 **IRB Exemption Date:** 02/23/24
TOPAZ Reference #: 114034

As a requirement of IRB Exemption you are required to:

1) Submit an IRB Exempt Amendment Form for all proposed additions or changes in the procedures involving human subjects. All additions and changes must be reviewed and approved prior to implementation.
2) Promptly submit an IRB Exempt Event Report Form for every serious or unusual or unanticipated adverse event, problems with the rights or welfare of the human subjects, and/or deviations from the approved protocol.
3) Submit an IRB Exempt Project Completion Report Form when the study is finished or discontinued.
4)

Special Conditions: N/A

For further information, you may visit the IRB website at http://research.fiu.edu/irb.

KMW

Appendix C: Participant Recruitment

Nicole Wertheim College of Nursing & Health Sciences

A teaching module on the use of Eye Movement Desensitization and Reprocessing (EMDR)

as part of a multidisciplinary treatment regimen for patients with chronic pain disorders.

Dear Envision Anesthesia Perioperative Providers:

My name is Seth Muller, and I am a student from the Anesthesiology Nursing Program Department of Nurse Anesthesiology at Florida International University. I am writing to invite you to participate in my quality improvement project. The goal of this project is to increase health care providers' awareness Eye Movement Desensitization and Reprocessing as an adjunctive treatment for patients experiencing chronic pain, for You are eligible to take part in this project because you are a part of the Memorial Regional Hospital perioperative provider.

If you decide to participate in this project, you will be asked to complete and sign a consent form for participation. Next, you will complete a pre-test questionnaire, which is expected to take approximately 5 minutes. You will then be asked to view an approximately 15 minutes long educational presentation online. After going through the educational module, you will be asked to complete the post-test questionnaire, which is expected to take approximately 5 minutes**. No compensation will be provided.**

Remember, this is completely voluntary. You can choose to be in the study or not. If you'd like to participate or have any questions about the study, please email or contact me at
Seth Muller – (786) 506-3304
Email: smull006@fiu.edu

Thank you very much.

Sincerely,

Seth Muller
(786) 506-3304

smull006@fiu.edu

Appendix D: Consent

FIU | FLORIDA INTERNATIONAL UNIVERSITY

CONSENT TO PARTICIPATE IN A QUALITY IMPROVEMENT PROJECT

A teaching module on the use of Eye Movement Desensitization and Reprocessing (EMDR) as part of a multidisciplinary treatment regimen for patients with chronic pain disorders.

SUMMARY INFORMATION
Things you should know about this study:

- **Purpose:** Educational module to increase providers awareness of EMDR and its use for alleviating chronic pain in certain populations.
- **Procedures**: If the participant chooses to participate, they will be asked to complete a pretest, watch a voice PowerPoint, and then a post test.
- **Duration**: This will take about a total of 20 minutes total.
- **Risks**: There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.
- **Benefits**: The main benefit to you from this research is increase the participants knowledge on EMDR and how to incorporate it in relation to anesthesia.
- **Alternatives:** There are no known alternatives available to the participant other than not taking part in this quality improvement project.
- **Participation:** Taking part in this quality improvement project is voluntary.

Please carefully read the entire document before agreeing to participate.

NUMBER OF STUDY PARTICIPANTS:

If the participant decides to be in this study, they will be one of approximately 10 participants people in this research study.

PURPOSE OF THE PROJECT

The participant is being asked to be in a quality improvement project. The goal of this project is to increase providers' knowledge on the use of EMDR in chronic pain, the pain theoriesrelated to how EMDR works and other potential beneficial uses of EMDR. If you decide to participate you will be one of approximately 10 participants.

DURATION OF THE PROJECT

The participation will require about 20 minutes.

PROCEDURES

If the participant agrees to be in the project, PI will ask you to do the following things:

1. Complete an online 10 question pre-test survey via Qualtrics, an Online survey product for which the URL link is provided
2. Review the educational PowerPoint Module lasting 15 minutes via Qualtrics, an Online survey product for which the URL link is provided.
3. Complete the online 10 question post-test survey via Qualtrics, an Online survey product for which the URL link is provided.

RISKS AND/OR DISCOMFORTS

The main risk or discomfort from this research is minimal. There will be minimal risks involved with this project, as would be expected in any type of educational intervention, which may include mild emotional stress or mild physical discomfort from sitting on a chair for an extended period.

BENEFITS

The following benefits may be associated with participation in this project: Increasing knowledge regarding to Eye Movement Desensitization and Reprocessing as a psychological method to treat pain as an adjunct to their regular pain management regiments. The overall objective of the program is to increase the providers' knowledge based on the current literature.

ALTERNATIVES

There are no known alternatives available to the participant other than not taking part in this project. However, if the participant would like to receive the educational material, it will be provided to them at no cost.

CONFIDENTIALITY

The records of this project will be kept private and will be protected to the fullest extent provided by law. If, in any sort of report, PI might publish, it will not include any information that will make it possible to identify the participant. Records will be stored securely, and only the project team will have access to the records.

PARTICIPATION: Taking part in this quality improvement project is voluntary.

COMPENSATION & COSTS

There is no cost or payment to the participant for receiving the health education and/or for participating in this project.

RIGHT TO DECLINE OR WITHDRAW

The participation in this project is voluntary. The participant is free to participate in the project or withdraw the consent at any time during the project. The participant's withdrawal or lack of participation will not affect any benefits to which you are otherwise entitled. The investigator reserves the right to remove the participant without their consent at such time that they feel it is in their best interest.

RESEARCHER CONTACT INFORMATION

If you have any questions about the purpose, procedures, or any other issues relating to this research project, you may contact Seth Hans Muller at (786) 506-3304 or email smull006@fiu.edu, as well as my advisor Dr. Vicente Gonzalez at (305) 348-0062 and email gonzalv@fiu.edu.

IRB CONTACT INFORMATION

If the participant would like to talk with someone about their rights pertaining to being a subject in this project or about ethical issues with this project, the participant may contact the FIU Office of Research Integrity by phone at 305-348-2494 or by email at ori@fiu.edu.

PARTICIPANT AGREEMENT

I have read the information in this consent form and agree to participate in this study. I have had a chance to ask any questions I have about this study, and they have been answered for me. By clicking on the "consent to participate" button below I am providing my informed consent.

Appendix E: Pretest and Posttest Evaluation

Pretest and Posttest Questionnaire:

A teaching module on the use of Eye Movement Desensitization and Reprocessing (EMDR) as part of a multidisciplinary treatment regimen for patients with chronic pain disorders.

INTRODUCTION

The primary aim of this QI project is to increase providers awareness of Eye Movement Desensitization and Reprocessing (EMDR) and chronic pain.

Please answer the question below to the best of your ability. The questions are either in multiple choice or true/false format and are meant to measure knowledge on EMDR and chronic pain.

DEMOGRAPHIC INFORMATION

1. **Gender:**

   Male

   Female

   Other_____

2. **Age:**

   25-35.

   36-45.

   46-55.

   56 and older.

3. **Ethnicity:**

Hispanic

Caucasian

African American

Asian

Other_____

Prefer to not say

4. **Position/Title:**

   CRNA

   Anesthesiologist

   Resident

   Anesthesiologist Assistant

5. **Level of Education:**

   Certificate

   Bachelors

   Masters

   DNP

   PhD

   MD/DO

6. How many years have you been a perioperative provider?

   1-2 years

   3-5 years

   6-10 years

   Over 10 years

1. What are some potential uses for EMDR? (Select 3).

   A. Chronic pain management.*

   B. Post-Traumatic Stress Disorder.*

   C. Anxiety.*

   D. Active Pain Management.

   E. Current active substance abuse.

2. What pain theory is referred to in using EMDR?

   A. Gate Theory.

   B. Limbically Augmented Pain Syndrome.*

   C. Specificity Theory.

   D. Pattern Theory.

3. EMDR has the potentially to completely alleviate pain in patients suffering from phantom limb pain in 15-40% of patients undergoing treatment (True or False).

   A. True*

   B. False

4. EMDR can provide long lasting pain relief for over 24 months. (True or False)

   A. True*

   B. False

5. What are the current Gold Standards for treatment of chronic pain? (Select 2).

   A. Opioids

   B. NSAIDs

C. Physical Therapy*

D. Surgical intervention

E. Cognitive Behavioral Therapy (CBT)*

6. How many sessions are required for EMDR to be effective in management of chronic pain?

   A. One singular session.

   B. Four sessions.

   C. Continuous treatment is necessary.

   D. Requires multiple sessions as determined by the administrating provider.*

7. How long does it take for chronic pain to manifest?

   A. Immediately after surgical intervention.

   B. Beyond the regular healing time of a surgical procedure.*

   C. Two weeks.

   D. One Month.

8. EMDR is capable of treating pain as the sole treatment option in patients experiencing chronic pain? (True or False).

   A. True

   B. False.*

9. What amount of adults in developing countries experience chronic pain in developed countries?

   A. 10%.

   B. 20%.*

   C. 15%.

D. Less than 10%.

10. With using EMDR what are some benefits to utilizing the therapy?

A. Improved quality of life.

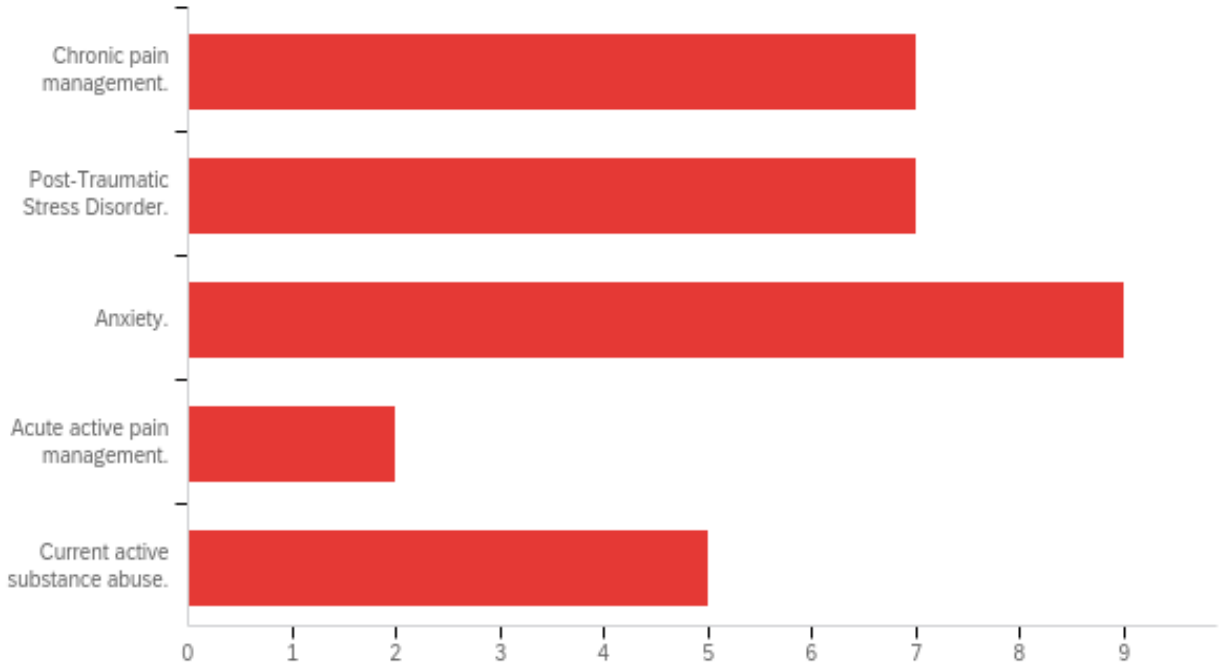
B. Reduced pain.

C. Reduced Medication consumption.

D. Reduction in disability.

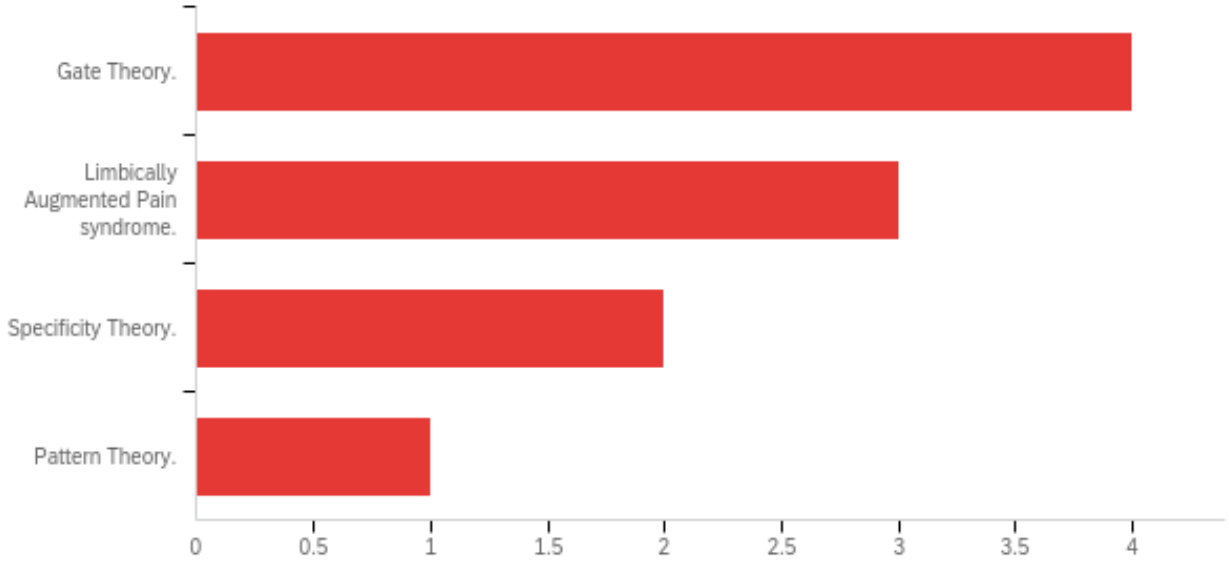
E. All of the above.*

Q1 - What are some potential uses for EMDR? (select 3)



#	Answer	%	Count
1	Chronic pain management.	23.33%	7
2	Post-Traumatic Stress Disorder.	23.33%	7
3	Anxiety.	30.00%	9
4	Acute active pain management.	6.67%	2
5	Current active substance abuse.	16.67%	5
	Total	100%	30

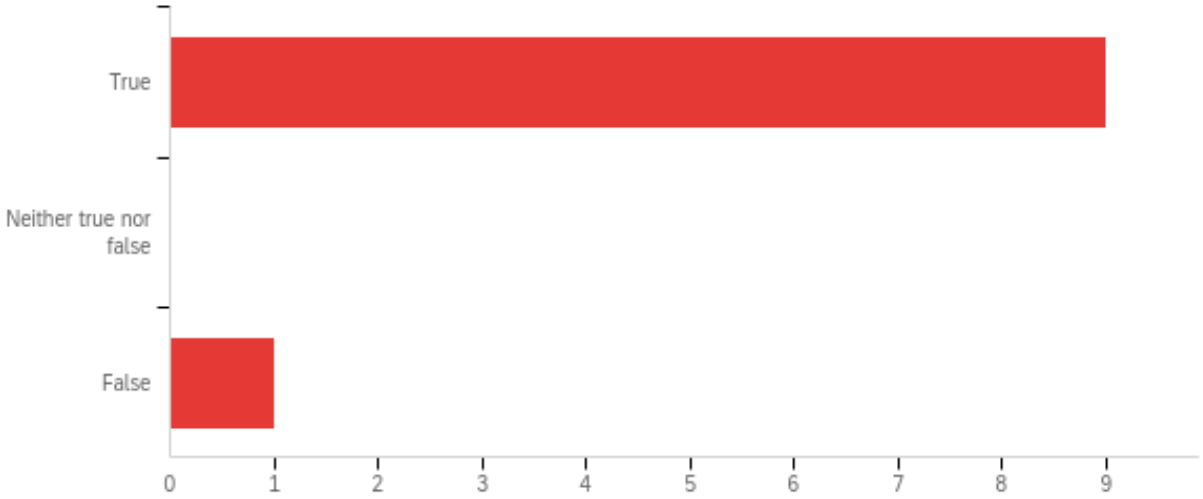
Q2 - What pain theory is referred to in using EMDR?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	What pain theory is referred to in using EMDR?	1.00	4.00	2.00	1.00	1.00	10

#	Answer	%	Count
1	Gate Theory.	40.00%	4
2	Limbically Augmented Pain syndrome.	30.00%	3
3	Specificity Theory.	20.00%	2
4	Pattern Theory.	10.00%	1
	Total	100%	10

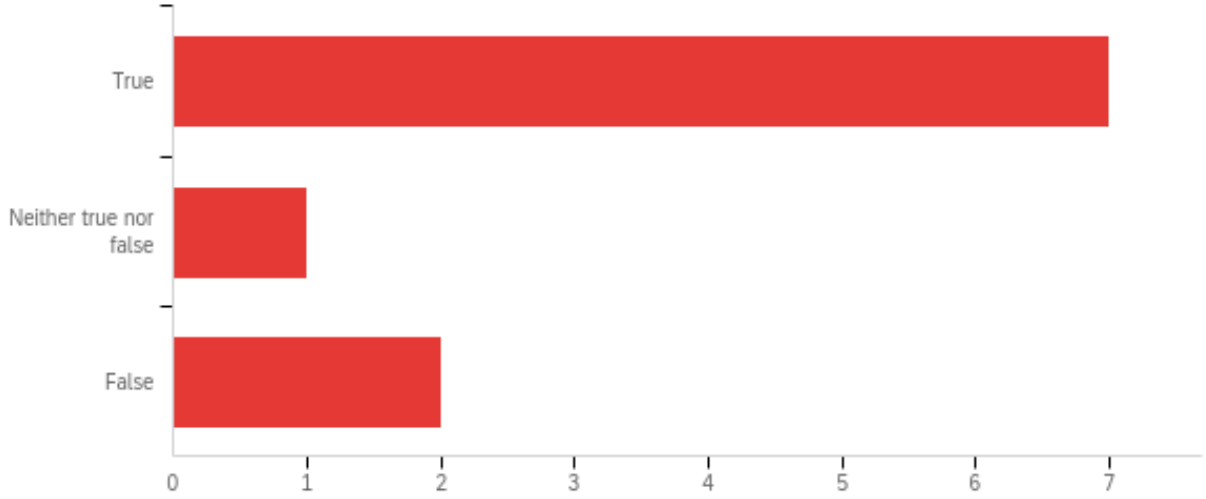
Q3 - EMDR has the potentially to completely alleviate pain in patients suffering from phantom limb pain in 15-40% of patients undergoing treatment (True or False).



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	EMDR has the potentially to completely alleviate pain in patients suffering from phantom limb pain in 15-40% of patients undergoing treatment (True or False).	1.00	3.00	1.20	0.60	0.36	10

#	Answer	%	Count
1	True	90.00%	9
2	Neither true nor false	0.00%	0
3	False	10.00%	1
	Total	100%	10

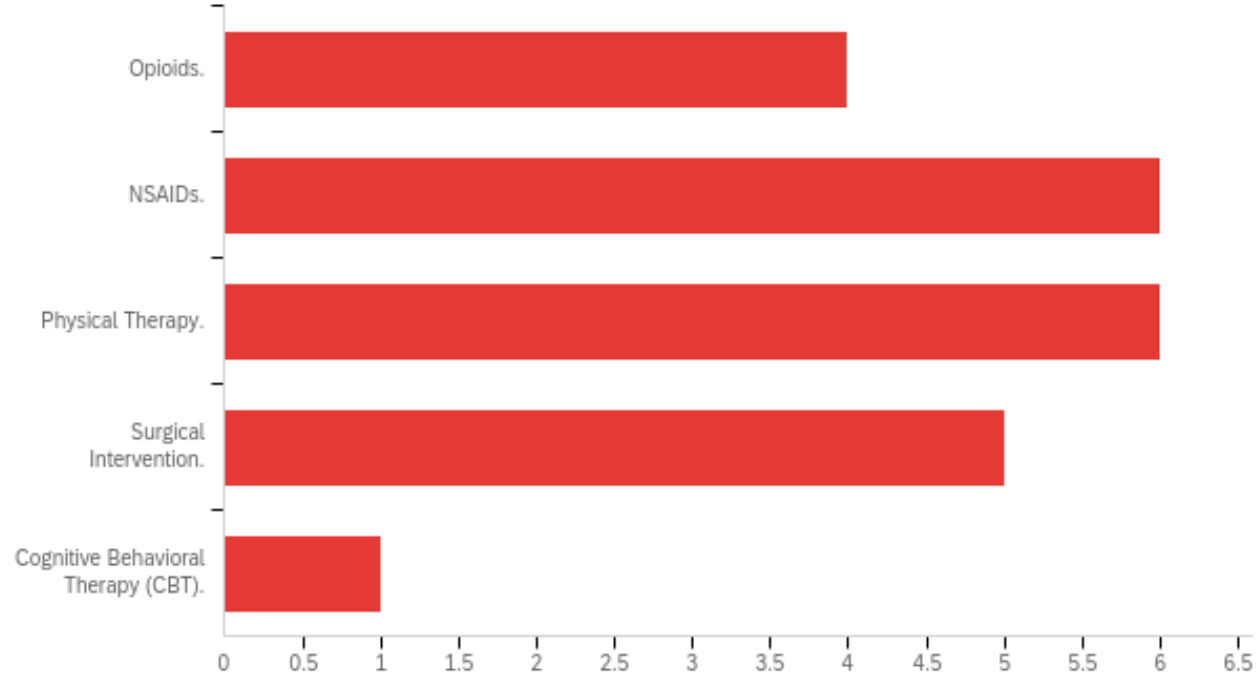
Q4 - EMDR can provide long lasting pain relief for over 24 months. (True or False)



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	EMDR can provide long lasting pain relief for over 24 months. (True or False)	1.00	3.00	1.50	0.81	0.65	10

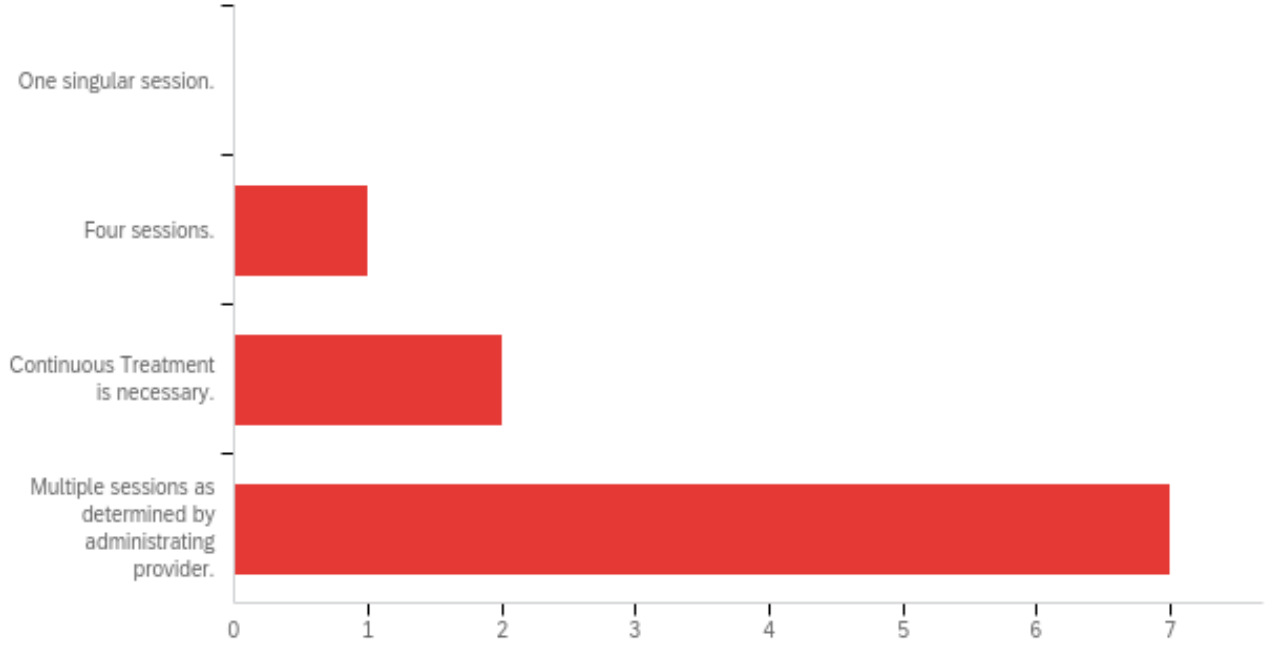
#	Answer	%	Count
1	True	70.00%	7
2	Neither true nor false	10.00%	1
3	False	20.00%	2
	Total	100%	10

Q5 - What are the current Gold Standards for treatment of chronic pain? (Select 2).



#	Answer	%	Count
1	Opioids.	18.18%	4
2	NSAIDs.	27.27%	6
3	Physical Therapy.	27.27%	6
4	Surgical Intervention.	22.73%	5
5	Cognitive Behavioral Therapy (CBT).	4.55%	1
	Total	100%	22

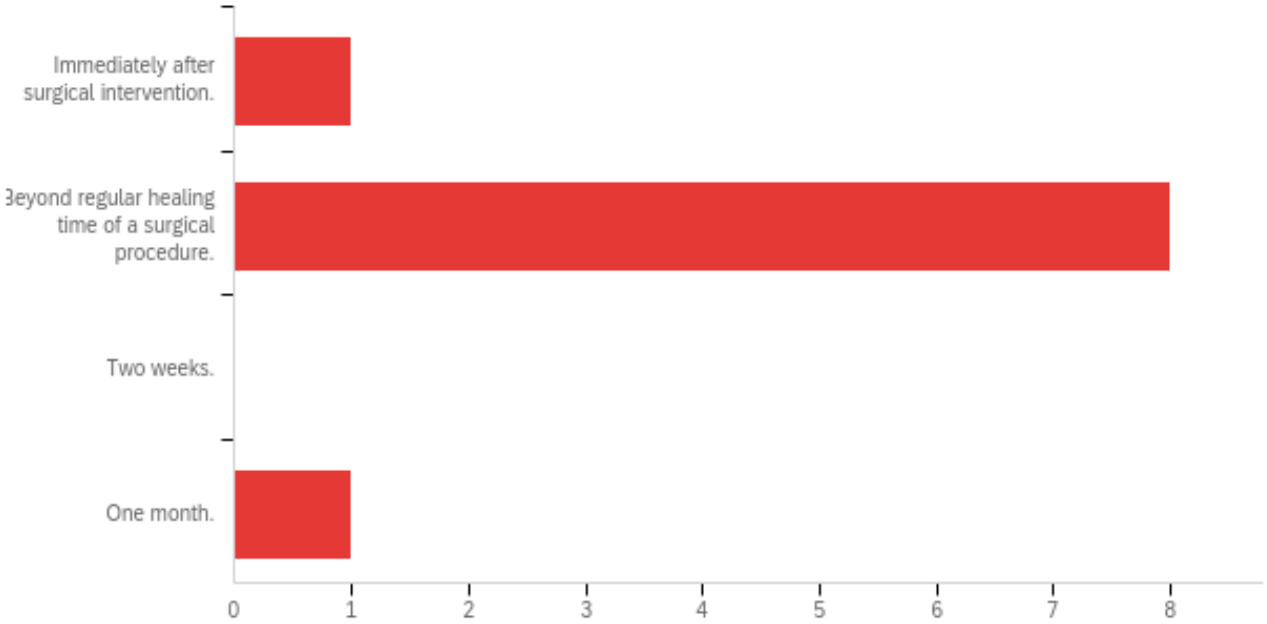
Q6 - How many sessions are required for EMDR to be effective in management of chronic pain?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How many sessions are required for EMDR to be effective in management of chronic pain?	2.00	4.00	3.60	0.66	0.44	10

#	Answer	%	Count
1	One singular session.	0.00%	0
2	Four sessions.	10.00%	1
3	Continuous Treatment is necessary.	20.00%	2
4	Multiple sessions as determined by administrating provider.	70.00%	7
	Total	100%	10

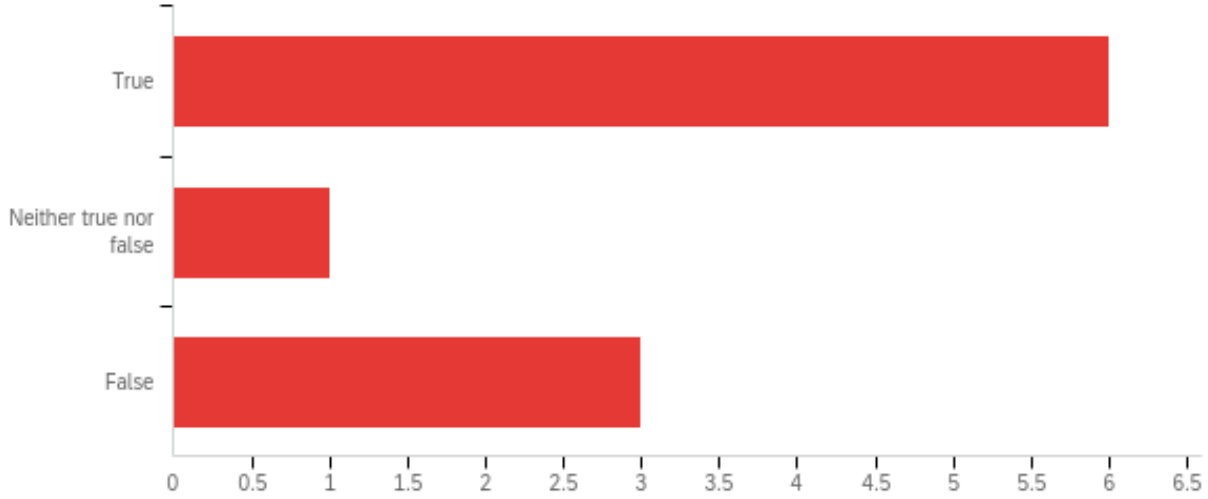
Q7 - How long does it take for chronic pain to manifest?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How long does it take for chronic pain to manifest?	1.00	4.00	2.10	0.70	0.49	10

#	Answer	%	Count
1	Immediately after surgical intervention.	10.00%	1
2	Beyond regular healing time of a surgical procedure.	80.00%	8
3	Two weeks.	0.00%	0
4	One month.	10.00%	1
	Total	100%	10

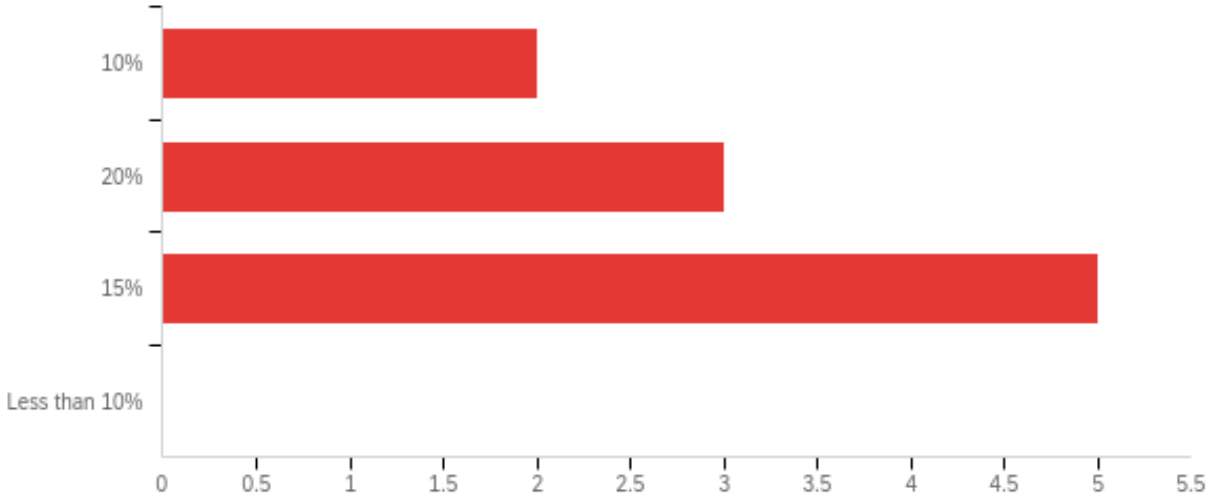
Q8 - EMDR is capable of treating pain as the sole treatment option in patients experiencing chronic pain? (True or False).



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	EMDR is capable of treating pain as the sole treatment option in patients experiencing chronic pain? (True or False).	1.00	3.00	1.70	0.90	0.81	10

#	Answer	%	Count
1	True	60.00%	6
2	Neither true nor false	10.00%	1
3	False	30.00%	3
	Total	100%	10

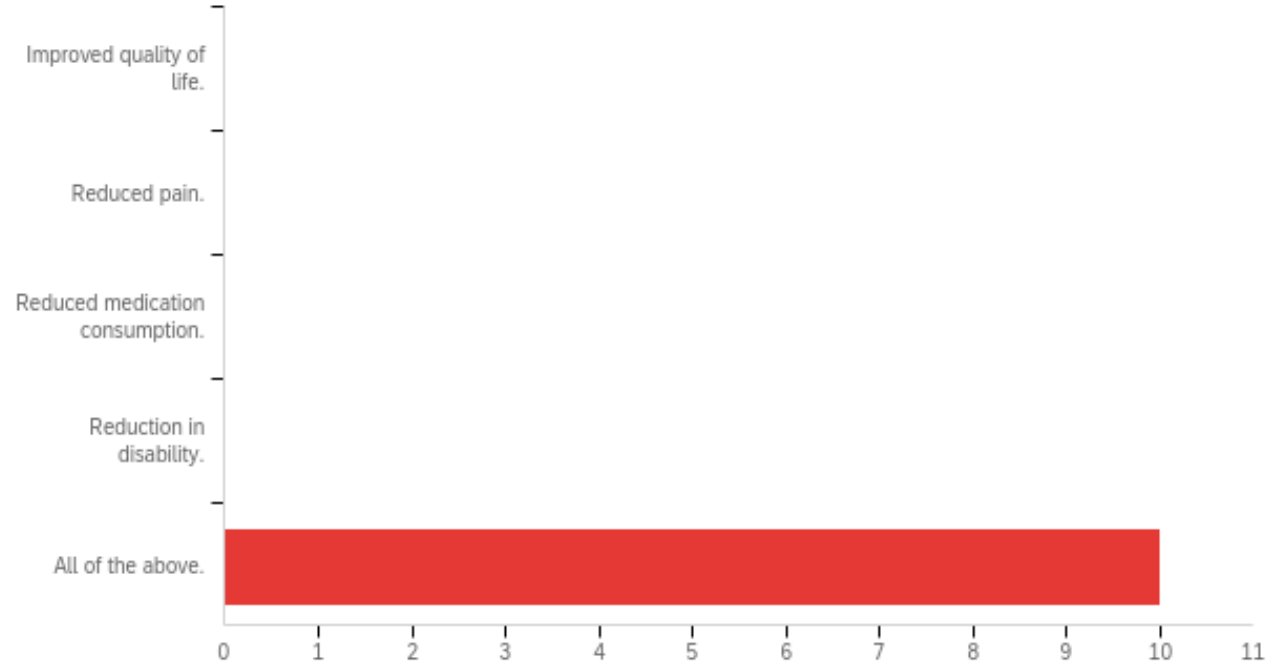
Q9 - What percentage of adults in developed countries experience chronic pain?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	What percentage of adults in developed countries experience chronic pain?	1.00	3.00	2.30	0.78	0.61	10

#	Answer	%	Count
1	10%	20.00%	2
2	20%	30.00%	3
3	15%	50.00%	5
4	Less than 10%	0.00%	0
	Total	100%	10

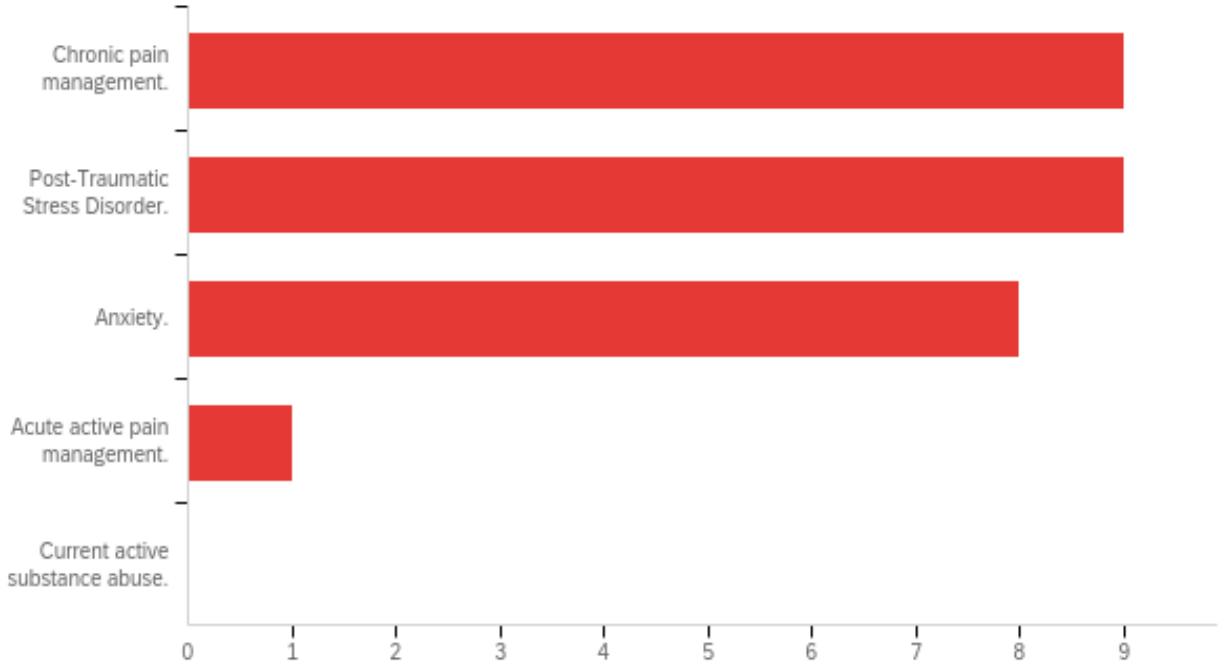
Q10 - With using EMDR what are some benefits to utilizing the therapy?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	With using EMDR what are some benefits to utilizing the therapy?	5.00	5.00	5.00	0.00	0.00	10

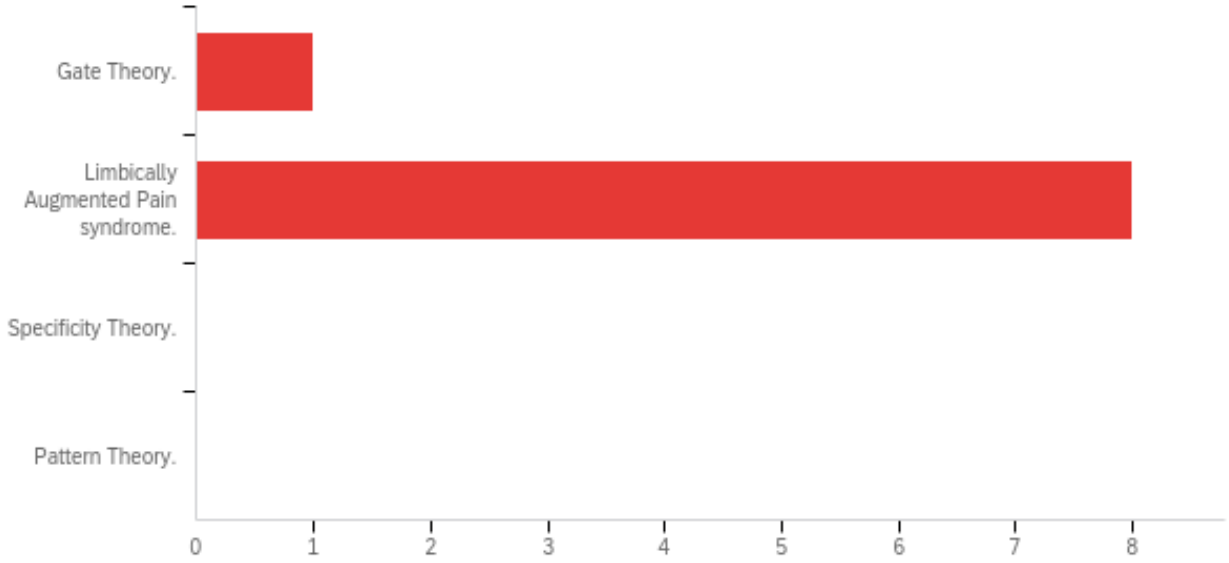
#	Answer	%	Count
1	Improved quality of life.	0.00%	0
2	Reduced pain.	0.00%	0
3	Reduced medication consumption.	0.00%	0
4	Reduction in disability.	0.00%	0
5	All of the above.	100.00%	10
	Total	100%	10

Q1 - What are some potential uses for EMDR? (select 3)



#	Answer	%	Count
1	Chronic pain management.	33.33%	9
2	Post-Traumatic Stress Disorder.	33.33%	9
3	Anxiety.	29.63%	8
4	Acute active pain management.	3.70%	1
5	Current active substance abuse.	0.00%	0
	Total	100%	27

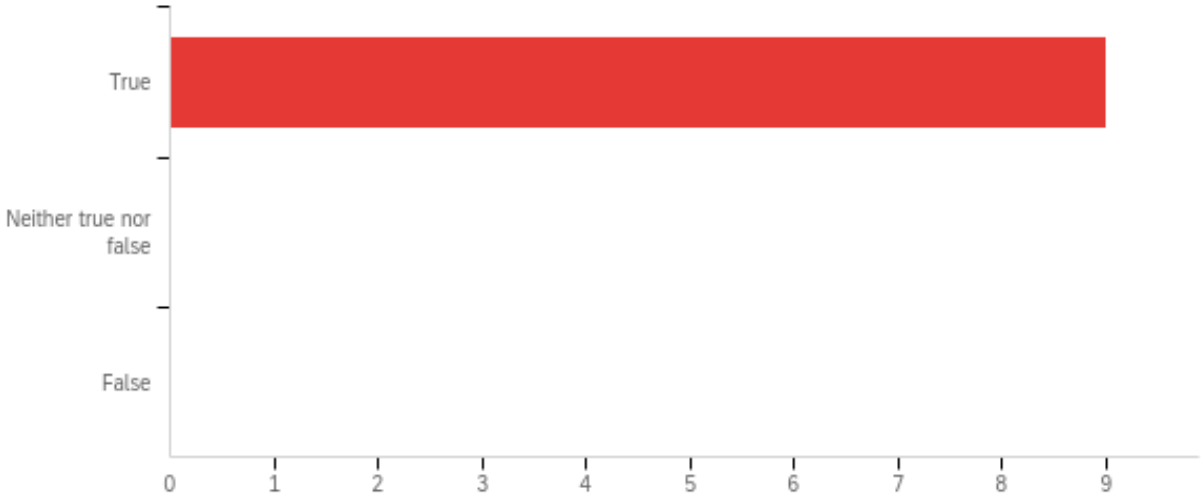
Q2 - What pain theory is referred to in using EMDR?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	What pain theory is referred to in using EMDR?	1.00	2.00	1.89	0.31	0.10	9

#	Answer	%	Count
1	Gate Theory.	11.11%	1
2	Limbically Augmented Pain syndrome.	88.89%	8
3	Specificity Theory.	0.00%	0
4	Pattern Theory.	0.00%	0
	Total	100%	9

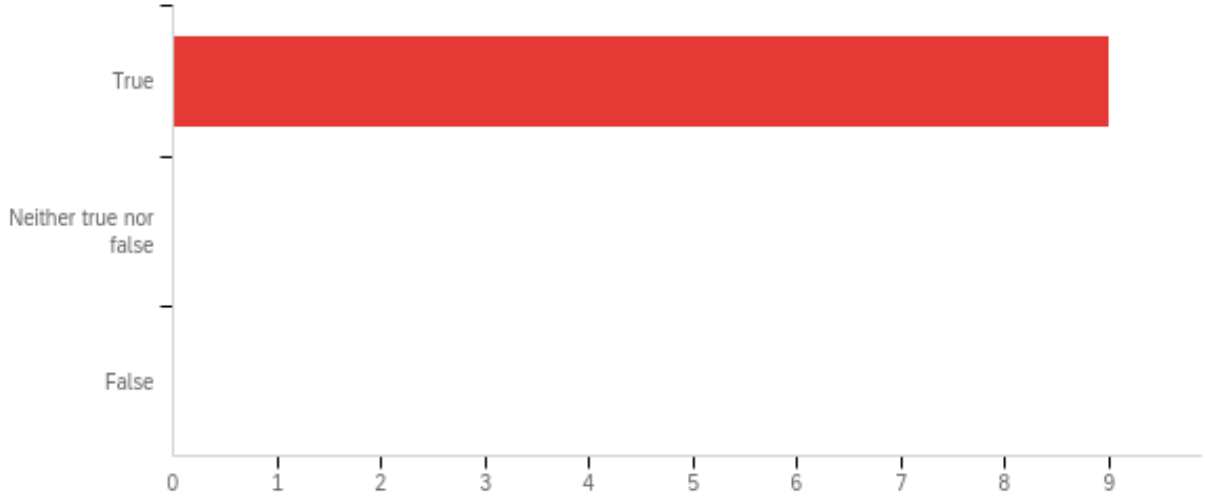
Q3 - EMDR has the potentially to completely alleviate pain in patients suffering from phantom limb pain in 15-40% of patients undergoing treatment (True or False).



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	EMDR has the potentially to completely alleviate pain in patients suffering from phantom limb pain in 15-40% of patients undergoing treatment (True or False).	1.00	1.00	1.00	0.00	0.00	9

#	Answer	%	Count
1	True	100.00%	9
2	Neither true nor false	0.00%	0
3	False	0.00%	0
	Total	100%	9

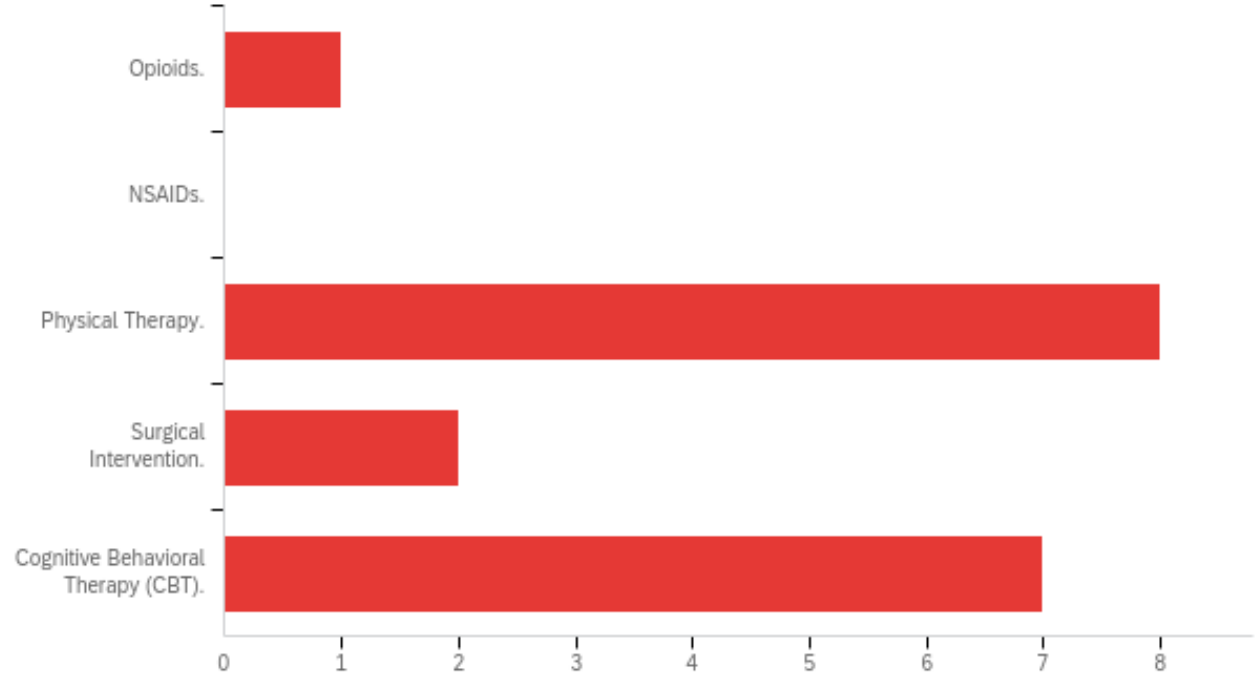
Q4 - EMDR can provide long lasting pain relief for over 24 months. (True or False).



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	EMDR can provide long lasting pain relief for over 24 months. (True or False).	1.00	1.00	1.00	0.00	0.00	9

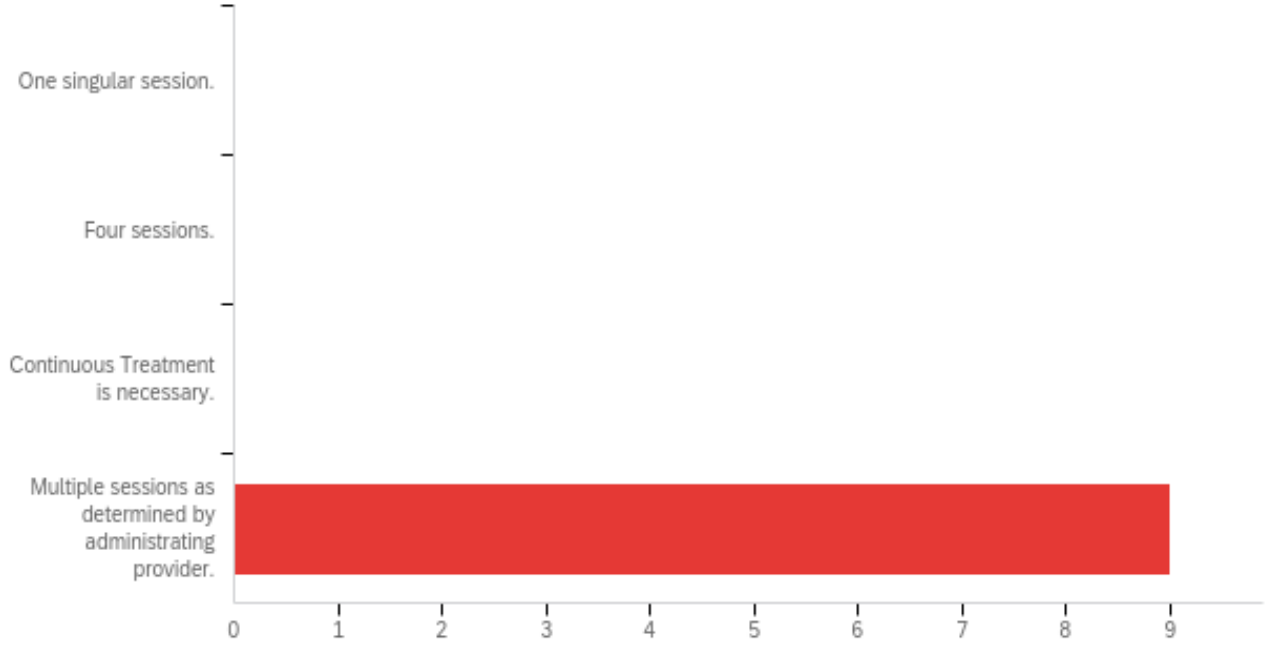
#	Answer	%	Count
1	True	100.00%	9
2	Neither true nor false	0.00%	0
3	False	0.00%	0
	Total	100%	9

Q5 - What are the current Gold Standards for treatment of chronic pain? (Select 2).



#	Answer	%	Count
1	Opioids.	5.56%	1
2	NSAIDs.	0.00%	0
3	Physical Therapy.	44.44%	8
4	Surgical Intervention.	11.11%	2
5	Cognitive Behavioral Therapy (CBT).	38.89%	7
	Total	100%	18

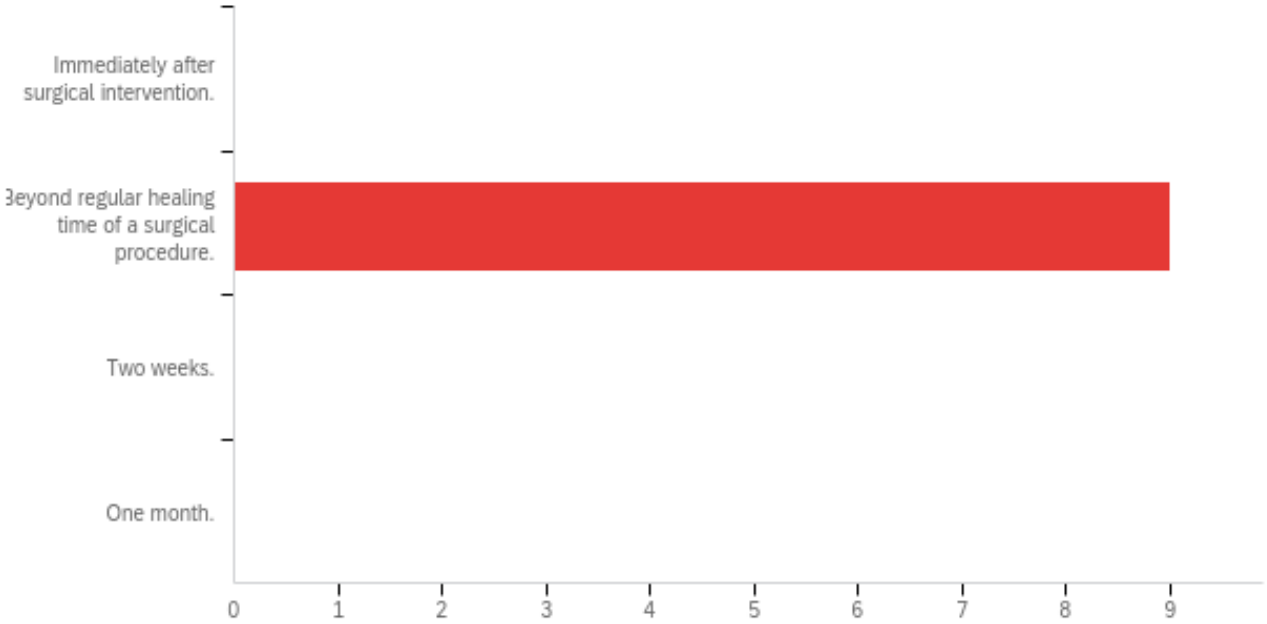
Q6 - How many sessions are required for EMDR to be effective in management of chronic pain?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	How many sessions are required for EMDR to be effective in management of chronic pain?	4.00	4.00	4.00	0.00	0.00	9

#	Answer	%	Count
1	One singular session.	0.00%	0
2	Four sessions.	0.00%	0
3	Continuous Treatment is necessary.	0.00%	0
4	Multiple sessions as determined by administrating provider.	100.00%	9
	Total	100%	9

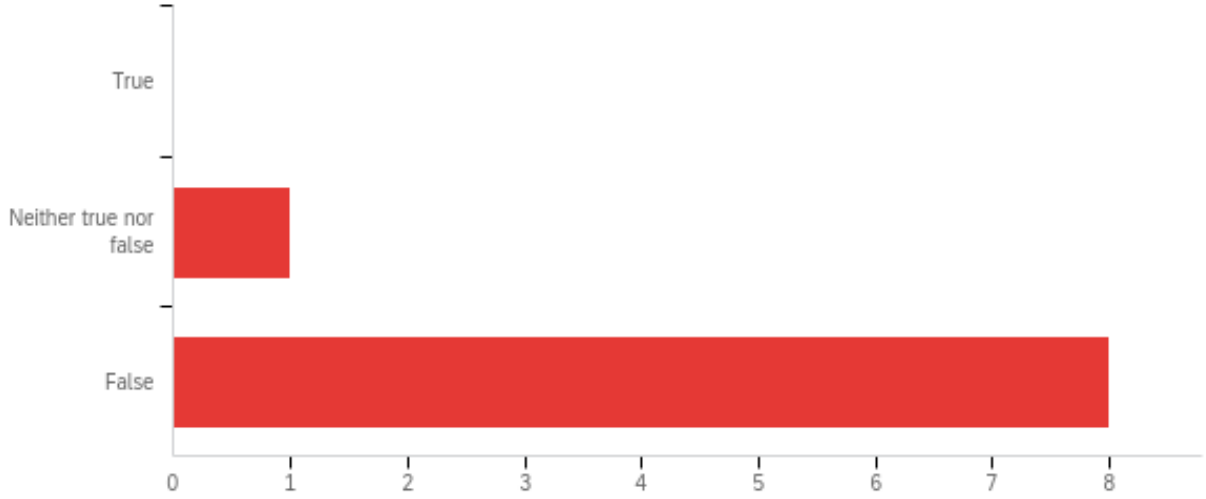
Q7. How long does it take for chronic pain to manifest?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	7. How long does it take for chronic pain to manifest?	2.00	2.00	2.00	0.00	0.00	9

#	Answer	%	Count
1	Immediately after surgical intervention.	0.00%	0
2	Beyond regular healing time of a surgical procedure.	100.00%	9
3	Two weeks.	0.00%	0
4	One month.	0.00%	0
	Total	100%	9

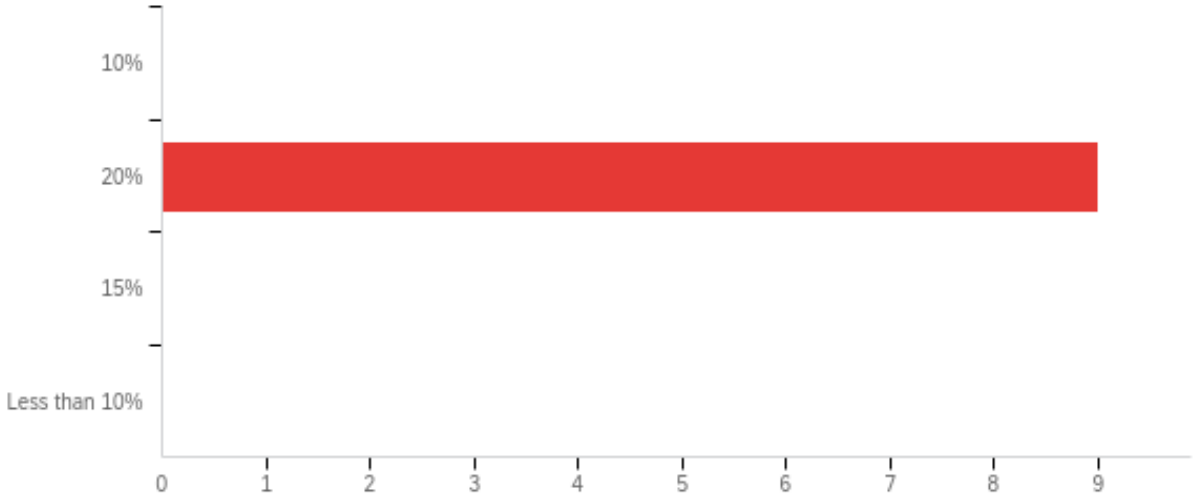
Q8 - EMDR is capable of treating pain as the sole treatment option in patients experiencing chronic pain? (True or False).



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	EMDR is capable of treating pain as the sole treatment option in patients experiencing chronic pain? (True or False).	2.00	3.00	2.89	0.31	0.10	9

#	Answer	%	Count
1	True	0.00%	0
2	Neither true nor false	11.11%	1
3	False	88.89%	8
	Total	100%	9

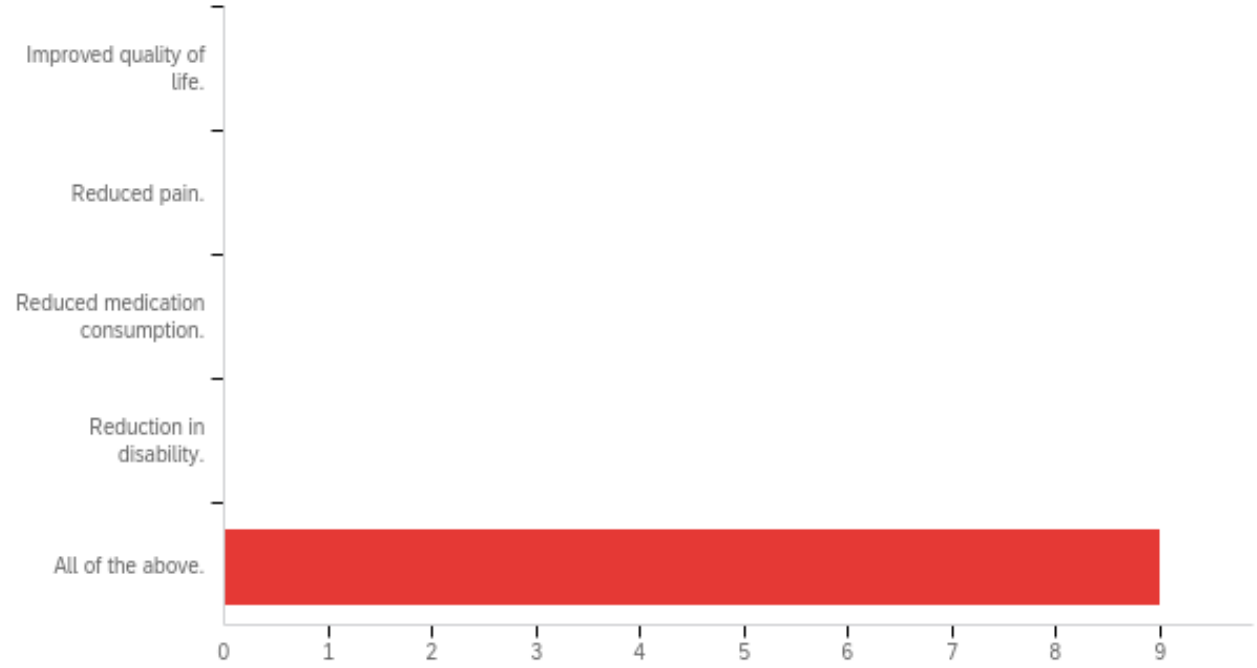
Q9 - What percentage of adults in developed countries experience chronic pain?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	What percentage of adults in developed countries experience chronic pain?	2.00	2.00	2.00	0.00	0.00	9

#	Answer	%	Count
1	10%	0.00%	0
2	20%	100.00%	9
3	15%	0.00%	0
4	Less than 10%	0.00%	0
	Total	100%	9

Q10 - With using EMDR what are some benefits to utilizing the therapy?



#	Field	Minimum	Maximum	Mean	Std Deviation	Variance	Count
1	With using EMDR what are some benefits to utilizing the therapy?	5.00	5.00	5.00	0.00	0.00	9

#	Answer	%	Count
1	Improved quality of life.	0.00%	0
2	Reduced pain.	0.00%	0
3	Reduced medication consumption.	0.00%	0
4	Reduction in disability.	0.00%	0
5	All of the above.	100.00%	9
	Total	100%	9

Appendix F: Citi Training

CITI PROGRAM

Completion Date 26-Jan-2022
Expiration Date 25-Jan-2025
Record ID 46910391

This is to certify that:

Seth Muller

Not valid for renewal of certification through CME.

Has completed the following CITI Program course:

Basic/Refresher Course - Human Subjects Research
(Curriculum Group)
Biomedical Human Research Course
(Course Learner Group)
1 - Basic Course
(Stage)

Under requirements set by:

Florida International University

CITI
Collaborative Institutional Training Initiative

101 NE 3rd Avenue, Suite 320
Fort Lauderdale, FL 33301 US
www.citiprogram.org

Verify at www.citiprogram.org/verify/?w6d7ac25f-acd9-4486-b95b-72ef3aaabff7-46910391

Appendix G: Educational Module

LEARNING GOALS

- To explain the implications of chronic pain.
- Review the common symptoms associated with chronic pain.
- Learn what EMDR is and how it can help manage chronic pain in an interdisciplinary setting.
- Review the theory behind how EMDR works.
- Describe how a session of EMDR is conducted

The clinical problem

- Chronic pain.
- Occurrence and timeline.
- Sequelae of symptoms.
  - Quality of life.
  - Provider burden.

Current practice

- Pharmaceutical.
  - NSAIDs, Opioids, Steroid Injections.
- Surgical treatment.
  - Invasive, potentially worsening conditions.
- Psychological.
  - Cognitive Behavioral Therapy (CBT).
- Gold Standards.
  - Physical Therapy
  - CBT

An adjunctive solution

- Utilizing a psychotherapy technique as an adjunct to treating chronic pain as the patient undergoes standardized treatment.
  - Eye Movement Desensitization and Reprocessing (EMDR).

Pain theory related to EMDR

- Limbically Augmented Pain Syndrome – Rome & Rome (2000).
- **When applying EMDR to this theory, it is possible that the treatment desensitizes the limbically augmented portion of the pain experience.**[7]

EMDR – What is it?

- Psychotherapy technique.
  - New learning for alleviating or eliminating distressing symptoms.
- Adaptive Information Processing (AIP) Model.
  - Traumatic experiences triggering pathological symptomatology.
    - Flashbacks.
    - Nightmares.
    - Physical sensations.
    - Chronic pain.

How is a session run?

- Three phases:
- Identification.
- Desensitization and “sets”.
- Bilateral stimulation – strengthening the positive cognition.

Patient will continue to receive standardized treatment as EMDR will play as an adjunct.

- As time progresses the use of medication can be reduced as tolerated.

Summarizing the literature

- Requires multiple sessions for full effectiveness, anywhere between 4-16 sessions.
- EMDR provided long lasting pain relief after multiple sessions. Pain relief was long lasting relief in a 24-month follow-up.
- Pain relief was effective in reducing medication usage. Therefore, reducing costs to the patient.
- Complete pain relief in patients with chronic phantom limb pain in 15-40% of patients.
- Pain relief was also applied to adolescents in an acute setting which provided superior pain relief compared to treatment as usual and cognitive behavioral therapy.

Take home summary

- Superior pain relief associated with use of EMDR as an adjunct to standardized treatment compared to other adjuncts and treatment as usual.
- Long lasting pain relief.
  - Up to 24 months in follow-up in the literature.
- Cessation of pain in 15-40% of patients, most notably in those experiencing phantom limb pain.
  - Medication consumption is reduced.
- Sessions take time, upwards of 45-90 minutes and multiple sessions are required.
- Limbically augmented pain syndrome (Rome & Rome 2000).
  - Desensitization and separation of trigger factors associated with pain and ”cellular memory” triggering pain.

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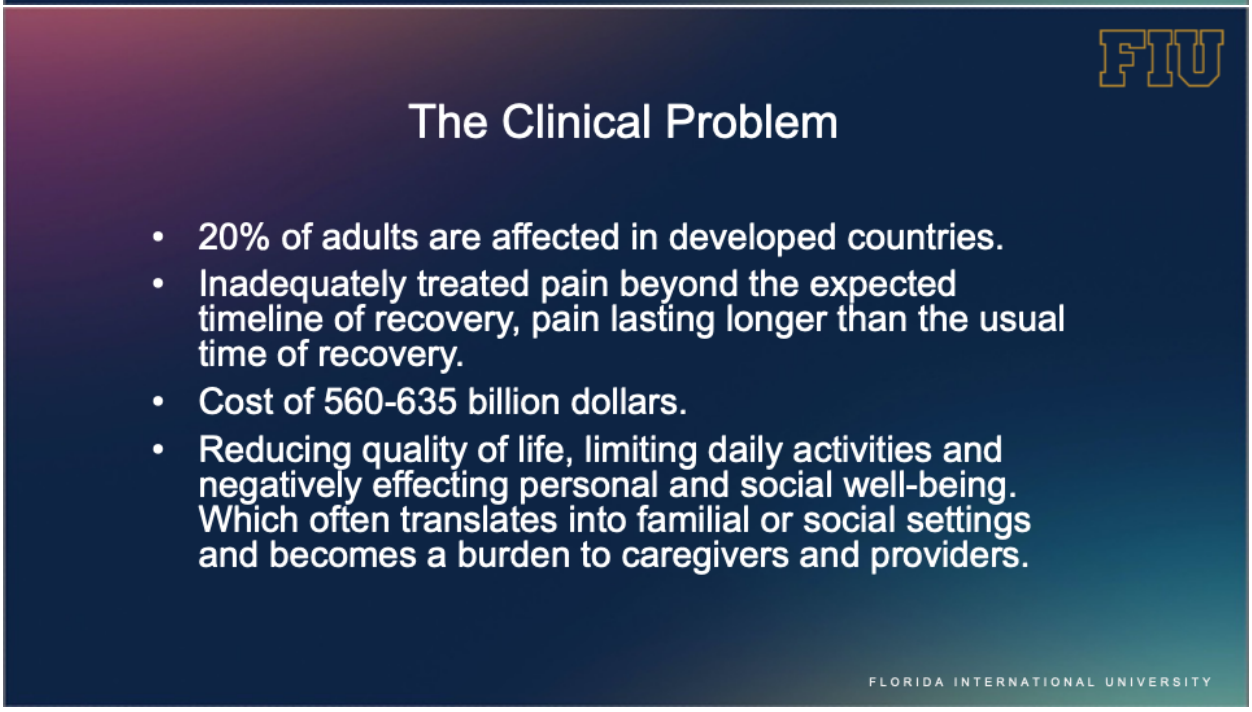
Appendix H: Dissemination PowerPoint



EMDR – What is it?

EMDR is an integrative psychotherapy approach that facilitates the expression of problematic emotional responses that, when done in a controlled fashion, provide conditions for new learning and alleviate or eliminate distressing symptoms.[7] It is based on an adaptive information processing (AIP) model that assumes that past traumatic experiences are implicated in triggering present pathologic symptomatology, inducing flashbacks, nightmares, physical sensations, and chronic pain.[7]

So this would implicate past traumatic experiences as triggers for painful stimuli, even if there is no stimulus currently present.

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Limbically Augmented Pain Syndrome

- The therapy is linked to neurophysiological research related to sensitization processes and limbically augmented pain syndrome, a theory developed by Rome and Rome in 2000 (Limbically augmented pain syndrome), which proposed that repeated exposure to painful stimuli and traumatic experiences can induce a complex series of neuroplastic processes at the corticolimbic levels that transduce information from within the body or the environment into cellular memory, which can augment pain response to future stimuli, even if the stimulus is not painful in nature.[7]

How is a session conducted?

- Three sections:
- Identification.
- Desensitization and "sets".
- Bilateral stimulation – strengthening the positive cognition.
- Patient will continue to receive standardized treatment as EMDR will play as an adjunct.
- As time progresses the use of medication can be reduced as tolerated.

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QI Methods

Obtaining Research Articles and Data

- 4 Databases: PubMed, Embase, CINAHL, and APA PsycNet.
- Inclusion Criteria: Articles using EMDR for patients experiencing chronic pain, Randomized controlled Trials, Case studies, Systematic reviews, articles written in English.
- 123 articles identified with 9 accepted after applying inclusion and exclusion criteria.
- Obtain additional articles for background information.

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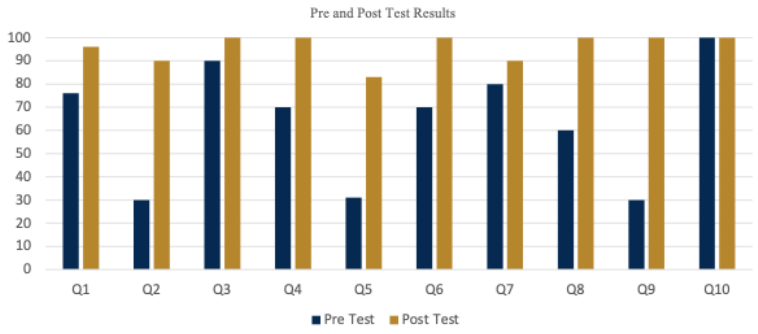
QI Methods Continued

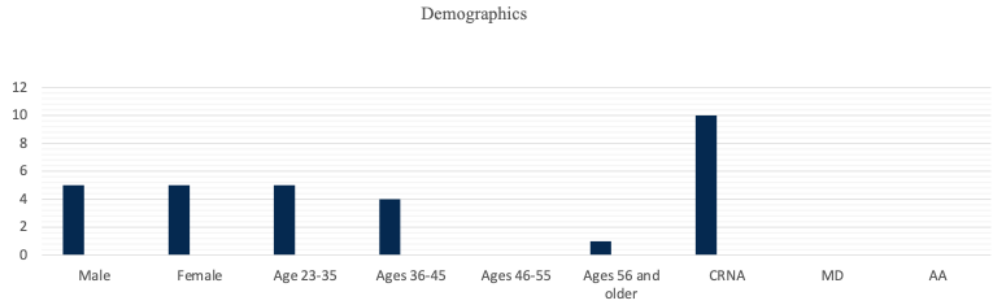
Quality improvement Project Creation.

- Create an educational module to dispense information and create a pre-test and post-test questionnaire to compare results and decipher if the educational module was successful or not.
- The educational portion of the module comes in the form of a video PowerPoint connected with a YouTube video to watch at the individual's discretion.
- With creation of the module, obtain an email list from faculty advisor to distribute the educational module.

QI Results



QI Demographics



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Discussion

- Ten participants achieved for the educational module and project.
  - Out of 50 participants originally sent for in the provided email list.
- Significant increase post test results in comparison to the pre-test questionnaire, specifically in five questions.
- Five questions showed a significant increase in the post-test.
- Strengths:
  - Anonymous.
  - Completion at own convenience.
    - Laptop, desktop, or cellphone.

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Limitations

- Capability to ignore educational module and click through pre and post tests skewing results.
- Limited sample size obtained compared to the distribution size of the project.
  - Force answer questions.
  - Post test unavailable until after link of YouTube video.
- Limited amount of articles for EMDR in chronic pain.
  - Majority of articles presented included use for anxiety, depression, and PTSD.
  - Relatively new and not well known topic for chronic pain.

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Conclusion

- EMDR has a multitude of uses.
  - Cognitive disorders: Anxiety, Depression, PTSD.
  - Chronic pain and desensitization of “limbically augmented pain syndrome”.
- A new avenue of pain management that results in:
  - Reduced pain levels.
  - Decreased medication consumption.
  - Potential to eliminate pain altogether.
- The results indicated that learning had been accomplished with the educational module.
- Increased awareness regarding the use of EMDR as a viable therapy option for chronic pain.

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Thank you for

- Thank you for your listening
- Thank you for your time and patience.
- And big thanks to Dr. Gonzalez and Dr. Diaz.

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Appendix I: Virtual Poster