The treatment of trauma-induced sexual pain among women: Clinical considerations for the use of adjunctive EMDR

Trehani M. Fonseka, Carrie Smith

The Canadian Journal of Human Sexuality, Volume 30, Number 1, April 2021, pp. 114-124 (Article)

Published by University of Toronto Press

The treatment of trauma-induced sexual pain among women: Clinical considerations for the use of adjunctive EMDR

Trehani M. Fonseka and Carrie Smith
School of Social Work, King's University College at Western University, London, Ontario, Canada

Almost half of all women experience a sexual pain disorder in their lifetime, including dyspareunia, vaginismus, vulvodynia, and provoked vestibulodynia. Despite significant negative consequences across quality of life indices, few women seek treatment for sexual pain, and among those who do access support, more than half report that currently available strategies are ineffective or even harmful in some cases. This outcome may partly result from a standard of care that prioritizes pharmacotherapy and/or physiotherapy within pain management protocols rather than psychological interventions despite their demonstrated ability to yield comparatively better treatment outcomes. In considering that some women experience sexual pain in the aftermath of a sexually traumatic event, Eye Movement Desensitization and Reprocessing (EMDR), a type of evidence-based trauma therapy, may be a suitable adjunctive treatment to mitigate symptoms by targeting psychological risk factors. In this report, the authors first review the impact of sexual trauma on sexual pain, particularly the biopsychosocial effects of trauma within the body and its hypothesized mechanisms of action on sexual functioning, and then provide an overview of EMDR therapy, including how it promotes the resolution of trauma symptoms and its effects on sexual pain. By presenting this evidence, the authors will explore how EMDR therapy may have utility as a novel adjunctive treatment to address sexual trauma-induced sexual pain disorders and optimize the provision of care among this clinical population.

KEYWORDS: EMDR, sexual pain, sexual trauma, trauma therapy, women's sexual health

Sexual pain disorders are complex conditions that affect up to 45% of women (Bergeron et al., 2015). These conditions, comprised of dyspareunia, vaginismus, vulvodynia, and provoked vestibulodynia, are characterized by persistent or recurrent pain localized to the vulva, vulvar vestibule, vagina and/or pelvis during vaginal penetration and/or sexual intercourse (American Psychiatric Association, 2013; Bornstein et al., 2016; Friedrich, 1987). Women who experience sexual pain disorders suffer from a reduced quality of life, as demonstrated by increased psychological distress and negative self-assessment, sexual dissatisfaction, and impaired interpersonal functioning within intimate partner relationships (Donaldson & Meana, 2011). Sexual pain disorders represent an under-researched clinical area, with limited understanding of the etiology and mechanisms of disease, which has precluded the development of effective treatment options. Consequently, less than half of affected women seek treatment for a sexual pain disorder (Reed et al., 2012), and among those who do access support, more than 60% of patients report that currently available strategies often have no effect or even worsen their symptoms (Sadownik, 2000). These outcomes may, in part, result from a current standard of care that predominantly addresses pain indices through pharmacotherapy and/or physiotherapy (Lamvu et al., 2018), with minimal regard for psychological interventions despite their ability to yield comparatively larger treatment effects (Thomtén, 2014; van der Kolk et al., 2007).

The onset of sexual pain can result from a dynamic interplay of risk factors that are unique to the individual. The literature highlights several risk factors for sexual pain including anxious and avoidant attachment styles (Leclerc et al., 2015), high catastrophizing pain cognitions (Pukall et al., 2002), and hypervigilance towards pain (Payne et al., 2005). A history of trauma, stemming from exposure to any real or perceived threat(s), has also been identified as a risk factor for sexual dysfunction, with observed effects on sexual desire, arousal, performance, and satisfaction (Yehuda et al., 2015). In fact, sexual trauma, which refers to any non-consensual sexual contact or violence, has been specifically linked to the onset of sexual pain (Postma et al., 2013), presenting in nearly 60% of affected women (Leclerc et al., 2010). In considering this relationship between sexual trauma and sexual

CORRESPONDENCE concerning this article should be addressed to Trehani Fonseka, MSc, MSW, RSW, School of Social Work, King's University College at Western University, 266 Epworth Avenue, London, Ontario N6A 2M3 Canada. E-mail: tfonseka@uwo.ca

pain, trauma therapies may offer an innovative approach to pain relief by addressing underlying psychological mechanisms of disease.

Eye Movement Desensitization and Reprocessing (EMDR) therapy, as developed by psychologist Francine Shapiro, is an evidence-based trauma therapy that supports the processing and resolution of traumatic memories through the use of bilateral stimulation, which is believed to mediate these effects by leveraging internal information processing and memory networks, in addition to psychophysiological and neurobiological systems (Landin-Romero et al., 2018; Maxfield, 2019; Oren & Solomon, 2012; Shapiro, 2018). Alongside data suggesting that EMDR therapy outperforms other interventions to yield larger and more sustainable improvements in trauma symptomology (Wilson et al., 2018), there is extensive literature that demonstrates the efficacy of EMDR therapy in chronic pain management. More specifically, EMDR therapy has been associated with sustained improvements in pain intensity, pain sensations, and pain-related negative affect, including depressive and anxiety symptoms, with no reports of adverse events (Grant & Threlfo, 2002; Mazzola et al., 2009; Tesarz et al., 2014). The treatment effects of EMDR therapy further extend to specific chronic pain conditions such as fibromyalgia (Friedberg, 2004), phantom limb pain (Rostaminejad et al., 2017), migraines (Konuk et al., 2011), and rheumatoid arthritis (Nia et al., 2018). Given this evidence, the authors propose that EMDR therapy may have utility as a novel adjunctive treatment to address sexual trauma-induced sexual pain disorders, which will be the focus of this report.

THE IMPACT OF SEXUAL PAIN DISORDERS

Investigating treatment options for sexual pain disorders is of paramount importance, as the condition has far-reaching implications for affected women (and their partners) related to psychological, sexual, and interpersonal functioning (Donaldson & Meana, 2011). Several cross-sectional studies have demonstrated elevated rates of anxiety and depression among women experiencing sexual pain linked to increased self-dislike, negative self-evaluation, self-blame, body image concerns, and reduced self-esteem (Desrochers et al., 2008; Gates & Galask, 2001; Granot & Lavee, 2005; Maillé et al., 2014; Nylanderlundqvist & Bergdahl, 2003). Moreover, just under half of affected women also report increased feelings of isolation, invalidation, and helplessness (Nguyen et al., 2012; Ward & Ogden, 1994), which may mediate the relationship between pain during intercourse and depressive symptoms (Stout et al., 2018). Sexual pain further disrupts intimacy and sexuality, as evidenced by lower rates of arousal, desire, and orgasm, increased difficulty with affection and sexual communication, avoidance of intercourse, and reduced sexual satisfaction (Dubé et al., 2017; Pazmany et al., 2014; Ponte et al., 2009). Similar outcomes have been observed among the partners of affected women, with up to 70% endorsing negative relationship effects (Blair et al., 2015; Nylanderlundqvist & Bergdahl, 2003; Smith & Pukall, 2014). These findings suggest that the consequences of sexual pain disorders are broader than simply pain during intercourse, and that the burden of disease is essentially doubled when considering the extension of negative outcomes to romantic partners.

THE LINK BETWEEN SEXUAL TRAUMA AND SEXUAL PAIN DISORDERS

The Biopsychosocial Effects of Trauma

Exposure to traumatic experiences can influence homeostatic processes within the body, with documented effects on the brain and various internal networks such as the nervous, endocrine, cardiovascular, respiratory, and muscular systems (Solomon & Heide, 2005). The phenotype of these effects can differ between individuals but often leads to a symptom profile that manifests as varying degrees of re-experiencing the trauma through images or nightmares, avoidance of external (e.g. social withdrawal) and internal (e.g. emotional withdrawal) reminders of the trauma, and physiological responses that are shifted towards hyperarousal and hypervigilance (Bohleber, 2018). The neuroendocrine system is one hypothesized mechanism of action for these effects, as traumatic stress can induce both short- and long-term consequences on metabolism and neurophysiology, such as by triggering prolonged and/or hypersecretion of stress hormones (e.g. cortisol) and catecholamines (e.g. norepinephrine, epinephrine), which can go on to influence the body's fight, flight, and freeze responses (Solomon & Heide, 2005; Terpou et al., 2019). Once triggered, these survival responses can over-activate the sympathetic nervous system and interfere with sexual response pathways (Graziottin, 2000).

Traumatic stress can also produce structural and functional changes within the brain that affect cognitive, emotional, and social domains (Solomon & Heide, 2005), all of which have the potential to interfere with sexual attitudes and perceptions, libido, pleasure, and overall satisfaction. For example, the cingulate cortex, which includes the limbic and hippocampal systems involved in affect regulation and memory (Rolls, 2019), has been implicated in anticipatory and fearful responses to pain, and is thus believed to mediate the relationship between chronic pain and affect dysregulation secondary to a traumatic event (Rome & Rome, 2001; Vogt et al., 2003). Moreover, changes to patterns of cognition and attention can negatively heighten focus towards sexual stimuli that are perceived to be threatening and/or reorient attention away from enjoyable sexual experiences that support arousal, orgasm, and satisfaction (Abdolmanafi et al., 2016; Dove & Wiederman, 2000; Pascoal et al., 2018; van den Hout & Barlow, 2000). These outcomes can lead to an eventual withdrawal from sexual activity and interpersonal connection to avoid re-triggering feelings of vulnerability and loss of control that are associated with the original sexual trauma (Yehuda et al., 2015).

Although an in-depth review of the general effects of traumatic stress and its mechanisms of action is beyond the scope of this report, these data suggest that trauma exposure has the potential to interfere with sexual wellbeing by disrupting

interdependent psychological, cognitive, neuroendocrine, and neurobiological systems involved in regulating sexual functioning (for more information on how these systems interact to influence sexual function in women, see Meston & Frohlich, 2000 and Salonia et al., 2010).

The Effects of Sexual Trauma on Sexual Pain

Although traumatic stress can influence the onset of sexual problems in women with either sexual or non-sexual trauma histories (Letourneau et al., 1996; Yehuda et al., 2015), data show that exposure to sexual trauma yields a two-fold increase in risk for sexual pain compared to healthy controls (Landry & Bergeron, 2011). Moreover, among women who experience pain, a history of sexual trauma has also been implicated in higher levels of pain severity and functional impairment (Haskell et al., 2008). Risk estimates further increase if the sexual trauma occurred during childhood, which can subsequently lead to feelings of danger, reduced sexual interest, anorgasmia, painful sex, and sexual dissatisfaction in adulthood (Khandker et al., 2014; Leonard & Follette, 2002; Loeb et al., 2002; Najman et al., 2005; Reissing et al., 2003). It is therefore critical to address any consequences of sexual trauma in its early stages to mitigate symptom worsening since sexual dysfunction can persist for years after a traumatic event (Van Berlo & Ensink, 2000). The exact nature of the sexual trauma may also influence symptom profiles, as penetrative assault has been shown to yield comparatively worse outcomes for sexual functioning than non-penetrative assault (Leclerc et al., 2010).

Although the precise mechanism(s) of action through which sexual trauma increases the risk of sexual pain is unknown, general research on how traumatic stress broadly dysregulates biopsychosocial processes (as briefly presented in the previous section) provides some insight. For example, exposure to prior sexual trauma has the potential to recondition the brain's detection and assessment of healthy sexual behaviour as a source of imminent threat and mount an overactive sympathetic nervous system response that would impede healthy sexual functioning by impairing parasympathetic activation (Haskell & Randall, 2019). Since one of the roles of the parasympathetic nervous system is to coordinate physiological processes that support sexual activity, such as vaginal lubrication, blood flow, and muscle tone (Giuliano et al., 2002), its dysregulation during intercourse may contribute to sexual pain. In support, vaginal dryness among women with a sexual pain disorder can yield pain during intercourse in the short-term and contribute to long-term pain outcomes through increased localized tissue damage, which can further lead to an increased attentional bias towards pain during future intercourse attempts that maintains itself as part of an ongoing feedback loop (Payne et al., 2005; Sutton et al., 2012).

These findings highlight the increased risk that sexual trauma can have on the development of sexual dysfunction and showcase how diversity can ensue within pain disorder profiles based on the timing and nature of the traumatic event and the resultant pain pathways that are triggered within the body. Taken together, these data inform clinical practice by suggesting that a one-size-fits-all treatment approach is less efficacious than a strategy that is tailored to the unique experiences of the patient.

EMDR THERAPY AND SEXUAL PAIN

General Review of Psychological Treatments for Sexual Pain

Current treatment options for sexual pain have been less than optimal in alleviating symptoms (Sadownik, 2000). Although various biopsychosocial risk factors have been associated with disease onset (Bergeron et al., 2015), standard of care prioritizes biomedical factors through pharmacotherapeutic and/or physiotherapeutic strategies (Lamvu et al., 2018). Despite being excluded from routine sexual pain management, psychological interventions have been shown to yield comparatively more robust treatment effects than non-psychological strategies (Thomtén, 2014; van der Kolk et al., 2007). Psychotherapeutic treatments might yield these benefits by addressing antecedent psychological distress, which can otherwise increase the risk of a sexual pain disorder and negatively influence disease trajectory (Khandker et al., 2011; Pâquet et al., 2018).

Psychological interventions have been investigated for their utility in managing sexual pain broadly without regard for precipitating factors, although data are limited. Randomized controlled trials have shown that cognitive-behavioural therapy (CBT) can significantly improve outcomes related to pain, sexual functioning and satisfaction, and psychological adjustment among affected women, and even their partners when delivered among couples (Bergeron et al., 2001; Corsini-Munt et al., 2014; Engman et al., 2010), with effects maintained for up to 2.5 years (Bergeron et al., 2008; Masheb et al., 2009). Moreover, CBT yields high rates of participant satisfaction (Bergeron et al., 2001), and an improved sense of self-worth among women post-treatment (Engman et al., 2010), thus highlighting a broad range of effects. Hypnotherapy has also been investigated for its impact on vulvar pain, with data demonstrating a resolution of pain and increases in sexual satisfaction after six to eight sessions, with changes lasting up to one-year post-treatment (Kandyba & Binik, 2003; Pukall et al., 2007). Other less studied interventions include therapist-aided exposure therapy, with 90% of women achieving vaginal intercourse post-treatment (Ter Kuile et al., 2013), and mindfulness-based group therapy, which can improve pain hypervigilance and sex-related distress (Brotto et al., 2015). These data suggest that psychological interventions hold considerable promise towards improving outcomes for women with sexual pain disorders, with widespread and sustainable effects that extend beyond basic pain management.

Despite improved efficacy outcomes when addressing psychological risk factors, few treatments have targeted trauma as an underlying precursor of sexual pain. In response, trauma-focused therapies, such as EMDR, may be suitable strategies to support a sexual trauma-informed treatment approach. EMDR therapy

aims to reduce psychological and physiological symptoms of distress through enhanced processing of traumatic memories to bring about resolution of post-traumatic memory material (Oren & Solomon, 2012). The need for this form of therapy is based on the fact that trauma memories can become fragmented and disorganized within the brain while being encoded, and consequently trigger a host of affective and physiological symptoms that can negatively affect patient functioning (Ford, 2018). Use of adjunctive EMDR therapy within sexual pain management protocols would therefore optimize current treatment strategies by providing an integrated biomedical and psychological approach towards comprehensive care and improved patient outcomes as compared to monotherapeutic strategies.

Overview of EMDR Therapy

EMDR therapy, as guided by the Adaptive Information Processing (AIP) Model, suggests that trauma memories can be effectively retrieved and transmuted to reduce or resolve trauma symptoms (Hase et al., 2017). More specifically, the AIP Model is rooted in an understanding that although the brain typically has the capacity to process and integrate incoming information, these neural networks can become impaired by traumatic stress, which results in memory material being stored in an unprocessed form that is fragmented, disconnected from other memory networks that contain adaptive information, and easily triggered by internal and external stimuli (Shapiro, 2007; Shapiro & Laliotis, 2011). Under these conditions, it is typically the factual details (e.g. chronology, causation) of the trauma memory that will be left in a raw state and stored in fragments, as this processing task is assigned to the prefrontal cortex, a region of the brain that is particularly sensitive to the effects of stress hormones and often responds by going offline. Emotional and body-based aspects of the trauma memory are not affected in the same manner, as they are processed by the limbic system (Hill, 2020). Trauma processing will remain incomplete until all fragments of the memory are integrated, consequently creating the basis for future maladaptive responses that are seen within physical and psychological pathology (Hill, 2020; Solomon & Shapiro, 20082). In respect to sexual trauma, such maladaptive responses would be observable if patients were triggered to misread healthy sexual behaviours as threatening due to their resemblance to the original trauma(s), thereby causing a cascade of internal processes that can culminate in increased sexual pain. Thus, in order to mitigate these effects, the original traumatic memory would need to be reprocessed, which creates an entryway for the application of EMDR therapy.

EMDR therapy relies on a treatment approach that combines body-focused (bottom-up) and cognitive/behavioural-focused (top-down) processing (Solomon & Heide, 2005), which can more comprehensively address all aspects of impaired trauma memory processing as compared to other psychotherapies. In support, neurobiological data have shown an improvement in memory reconsolidation processes subsequent to treatment with EMDR therapy, as evidenced by high pre-treatment levels of limbic system activation that shift towards increased cortical activity post-treatment (Pagani et al., 2012). Under the eight stages of the structured EMDR therapy protocol (i.e. history taking, client preparation, assessment, desensitization, installation, body scan, closure, and re-evaluation), trauma memories are activated, such as by recalling sensory information, feelings, body sensations, and any negative cognitions associated with the experience, and then reprocessed, transmuted, and restored into adaptive memory networks via a process of reconsolidation that ultimately restores psychological wellbeing (Shapiro, 2018; Solomon & Shapiro, 20083). In practice, this protocol requires patients to simultaneously focus on the traumatic memory material and clinician-directed bilateral dual-attention stimulation such as eye movements or alternative forms of stimulation (e.g. auditory, tactile) to complete processing of the memories and reduce trauma symptomology (Hill, 2020; Shapiro, 2018). Post-treatment with EMDR therapy, patients typically experience a relatively rapid resolution of the traumatic experience, which is accompanied by reduced levels of distress and physiological activation (Shapiro, 2014).

Mechanisms of Action for EMDR Therapy

Although the exact mechanism of action behind EMDR therapy has not been clearly elucidated, there are several hypotheses on how the therapy yields its effects on trauma resolution. A systematic review by Landin-Romero et al. (2018) organized these potential mechanisms into three primary models:

(i) Psychological Model: This model suggests that the bilateral stimulation of EMDR therapy leverages a form of classical conditioning that triggers and subsequently extinguishes the orienting response towards threat that onsets when re-experiencing traumatic memories by replacing it with a relaxation response that desensitizes trauma symptoms. Bilateral stimulation may also yield its effects by enhancing the retrieval of any visual imagery associated with the trauma, which overwhelms the internal capacity of the working memory system and consequently impairs imagery vividness and emotionality, and promotes emotional detachment from the memory (Landin-Romero et al., 2018). Separate research supports additional cognitive effects of EMDR therapy, such as the ability of bilateral stimulation to increase memory accuracy, cognitive flexibility, and metacognitive awareness as compared to other therapies, and counteract dissociative defenses (Leeds, 2016).

(ii) Psychophysiological Model: This model suggests that bilateral stimulation has the ability to promote a reduction in physiological arousal by increasing the activity of the parasympathetic nervous system (Landin-Romero et al., 2018), as evidenced by lowered cortisol levels and heart rate, for example, across the course of EMDR therapy (Heber et al., 2002; Sack et al., 2008). The model also proposes that bilateral stimulation can induce a brain state that is comparable to rapid eye movement (REM) sleep, which supports improved memory consolidation and reorganization that reduces the strength and emotional charge of trauma memories (Landin-Romero et al., 2018).

(iii) Neurobiological Model: This model suggests that bilateral stimulation increases connectivity between the left and

right hemispheres of the brain and enhances activation of brain regions that facilitate the integration of different aspects of the traumatic experience (Landin-Romero et al., 2018). This increased activity and communication between neural regions is believed to improve memory integration by allowing the brain to retrieve all fragments of the trauma memory and process them together (Shapiro, 2018). The pairing of trauma memories with bilateral stimulation has also been shown to yield sustainable attenuation of fear responses by activating the superior colliculus and mediodorsal thalamus, which have been implicated in fear extinction and the suppression of fear-encoding processes within the basolateral amygdala (Baek et al., 2019).

Collectively, these proposed mechanisms of action highlight various pathways through which EMDR therapy can promote the resolution of trauma symptomology, including any symptoms of sexual pain. Thus, mitigation of pain in situations of sexual trauma-induced sexual pain disorders will likely involve exploiting some, if not all, of these pathways.

Effects of EMDR Therapy on Sexual Pain

Although the treatment of sexual pain disorders is not a primary indication for this trauma therapy, EMDR appears to have utility in addressing sexual trauma-induced sexual pain based on its documented ability to improve indices of both psychological and physical pain. The efficacy of EMDR therapy has been demonstrated by several empirical studies (Chen et al., 2014; De Jongh et al., 2019; Khan et al., 2018; Novo Navarro et al., 20184), prompting it to be recognized as a treatment of choice for managing psychological trauma within several international treatment guidelines (Courtois et al., 2017; National Institute for Health Care and Excellence, 2018; World Health Organization, 2013). EMDR therapy has also been used to treat chronic physical pain with no reports of adverse events (Friedberg, 2004; Grant & Threlfo, 2002; Konuk et al., 2011; Mazzola et al., 2009; Nia et al., 2018; Rostaminejad et al., 2017; Tesarz et al., 2014), likely by addressing underlying psychological factors that influence how pain is experienced and maintained (Tesarz et al., 2019). This pairing of psychological and physical treatment effects suggests that EMDR therapy may be able to simultaneously target both symptom domains to resolve trauma-induced sexual pain.

In support, the original EMDR therapy protocol has been formally adapted to create a modified version that is designed to treat sexual dysfunction among patients who present with no clear rationale or understanding of their sexual symptoms and struggle to demonstrate improvement in their physiological responses to intercourse. This adapted protocol, as outlined by Pillai-Friedman (2010), utilizes a three-pronged approach to target conditions of sexual dysfunction, which includes desensitizing activation and reprocessing memories around negative sexual experiences, mitigating triggers and anticipatory anxieties that affect current sexual functioning, and supporting healthy sexual functioning in the future by installing positive cognitions around sexuality and intercourse once negative cognitions have been reprocessed. This protocol, which is recommended for application within ongoing couples and sex therapy, can be used to address large-scale trauma that includes sexual assault, but also small-scale trauma that may onset from experiencing past shame around sexuality, both of which have the capacity to become internalized and affect sexual functioning (Pillai-Friedman, 2010).

Despite growing recognition that EMDR therapy would be efficacious in improving indices of sexual pain, experimental data on this topic are limited to date. Jebelli et al. (2018) investigated this association using a quasi-experimental design and found that EMDR therapy was effective in improving measures of sexual functioning, orgasm, sexual satisfaction, quality of life, and anxiety among women affected with chronic vaginismus, yet the rate of successful intercourse attempts did not significantly increase. Although the results from this study suggest that EMDR therapy may not be effective in fully extinguishing fearful and avoidant responses to sexual behaviours, findings were limited by a small sample size and use of assessment measures that were not specifically designed to evaluate indices of vaginismus. Furthermore, case report data provide support for the specific use of EMDR therapy to treat sexual pain disorders that onset subsequent to childhood sexual trauma, as demonstrated by significant post-treatment improvements in self- and clinician-rated anxiety and a reduction in the credibility of dysfunctional beliefs on intercourse after only three sessions (Torun, 2010). Based on this data, EMDR therapy may be an effective treatment option for sexual pain, with the specific advantage of rapid symptom relief while avoiding adverse outcomes.

ANTICIPATED RELEVANCE

EMDR therapy provides a personalized approach to treatment that can strengthen efficacy outcomes by tailoring protocols to address the unique experiences of the patient as compared to generic trial and error strategies. If proven to be effective, EMDR therapy offers a safe and non-invasive option to remedy sexual pain and its myriad of negative sequelae among affected women (and their partners), as compared to current standards of care that have proven to be ineffective or even harmful in most cases (Sadownik, 2000). EMDR therapy would also provide a more efficient and cost-effective solution to address both sexual pain and sexual trauma within a combined treatment model, especially considering that the cost associated with managing chronic pelvic pain alone is $25 million per annum in Canada (Chen et al., 2017). If EMDR therapy can be shown to outperform the standard of care for sexual pain, data could be used to advocate for expanded coverage under health insurance plans to include trauma therapy, at least for this specific indication, which would dramatically improve the accessibility of trauma supports. In fact, given the high rate of co-occurrence between sexual trauma and sexual pain (Leclerc et al., 2010), trauma and sexual health specialists may be advised to recommend EMDR therapy as a preventative treatment option to women in the immediate aftermath of a sexually traumatic event to avert the onset of sexual pain.

CONCLUSIONS AND FUTURE DIRECTIONS

EMDR therapy may be an effective, rapid, and fiscally-responsible adjunctive treatment option for sexual pain disorders that onset subsequent to a sexually traumatic event by allowing affected women to process underlying trauma that contributes to the disease state. Due to the minimal inclusion of trauma therapies within standard of care protocols for sexual pain to date, the integration of EMDR therapy into future clinical practice stands to yield significant advantages, as already observed with the treatment of non-sexual chronic pain (Friedberg, 2004; Grant & Threlfo, 2002; Konuk et al., 2011; Mazzola et al., 2009; Nia et al., 2018; Rostaminejad et al., 2017; Tesarz et al., 2014).

However, before EMDR therapy can be integrated into routine care, high quality experimental evidence is still needed to determine its efficacy on indices of sexual pain, in addition to other symptom domains including but not limited to sexual functioning, psychological wellness, and relationship satisfaction among affected women. To the authors' knowledge, no randomized controlled trials have investigated these associations despite preliminary evidence of efficacy from quasi-experimental (Jebelli et al., 2018) and case report data (Torun, 2010). However, future experimental investigations comparing adjunctive EMDR therapy to the current standard of care for sexual pain are needed to permit inferences of causality, and longitudinal data collection would also be beneficial to capture potential mechanisms of change over time. These data would inform EMDR therapy administration and application protocols and procedures for sexual pain disorders, such as the recommended length of treatment (e.g. number of sessions, frequency of maintenance sessions) to sustain long-term outcomes. Effects pertaining to the timing of therapy administration (early vs. late stage) on pain outcomes also require further study, in addition to investigating EMDR therapy as a preventative treatment.

Given that EMDR therapy has a documented ability to improve pain indices that onset without a trauma precursor (Friedberg, 2004; Grant & Threlfo, 2002; Konuk et al., 2011; Mazzola et al., 2009; Nia et al., 2018; Rostaminejad et al., 2017; Tesarz et al., 2014), greater research investigating the effects of EMDR therapy on sexual pain in the absence of sexual (or non-sexual) trauma is warranted. Exploring the efficacy of EMDR therapy for treating sexual pain in the aftermath of non-sexual trauma and among patients without a documented trauma history would also help to determine if response to treatment differs between groups. Moreover, an examination of the effects of EMDR therapy on sexual trauma-induced sexual pain in the presence of other psychiatric co-morbidities, such as depression, anxiety, and substance abuse, would be advantageous as these conditions have been shown to co-occur with trauma exposure (Karatzias et al., 2019; Najavits et al., 2017) and elevated pain profiles (Lerman et al., 2015; Workman et al., 2002), and may thus yield moderating effects on treatment efficacy.

Greater understanding of the mechanism(s) through which EMDR therapy mediates its sexual pain relief effects and how they overlap with currently hypothesized pathways involved in trauma resolution and the relief of non-sexual pain will be useful in identifying other biopsychosocial systems that can be leveraged to improve treatment outcomes. For example, studies have shown that chronic pain can result when the hypothalamic-pituitary-adrenal (HPA) axis becomes dysregulated in response to a stressor, such as a traumatic event (Chapman et al., 2008; Kaysen et al., 2003). In considering that the neuroendocrine system is a proposed network through which EMDR therapy influences trauma symptoms (Heber et al., 2002; Sack et al., 2008), future investigations may benefit from examining whether administration of EMDR therapy to treat sexual trauma-induced sexual pain is accompanied by changes in the neurochemical and endocrine signatures of the HPA axis, among other factors, in tandem with changes in trauma and pain signatures. This integration across biological and clinical data platforms can support the development of targeted interventions that yield greater efficacy outcomes than single modality approaches.

Finally, in respect to practice recommendations, it is vital for clinicians to acquire the necessary training for administering EMDR therapy among women with a sexual pain disorder since this clinical population presents unique challenges and considerations that would influence protocol application. Thus, more opportunities for training and supervision on the use of the adapted EMDR therapy protocol for sexual dysfunction (Pillai-Friedman, 2010) is essential to increase the number of clinicians who can competently practice in this area. Another consideration is the number of clinicians who are willing and comfortable to explore matters of sexual trauma and pain. To address this point, clinicians would need to examine their own attitudes around sexual trauma and perceptions of healthy sexual functioning to ensure that they can work within these areas without imposing judgement or bias onto their patients. This inward reflection can also be extended towards having clinicians identify and process their own unresolved traumas and sexual triggers that have the potential to resurface during treatment sessions and inadvertently cause harm to their patients and/or themselves.

In conclusion, EMDR therapy appears to hold considerable promise towards improving the treatment of sexual trauma-induced sexual pain disorders. However, before EMDR therapy can be routinely integrated into the standard of care for the management of sexual pain, greater steps need to be taken towards elucidating its efficacy and mechanism(s) of action on various indices of sexual pain using experimental trials, in addition to developing more specialized treatment guidelines for its specific use among this clinical population.

REFERENCES

Abdolmanafi, A., Owens, R. G., Winter, S., Jahromi, R. G., Peixoto, M. M., & Nobre, P. (2016). Determinants of women's sexual dissatisfaction: Assessing a cognitive-emotional model. *The Journal of Sexual Medicine*, *13*(11), 1708–1717. https://doi.org/10.1016/j.jsxm.2016.08.013. Medline:27665196

American Psychiatric Association. (2013). *Diagnostic and statistical manual of mental disorders* (5th ed.). American Psychiatric Publishing.

Baek, J., Lee, S., Cho, T., Kim, S.-W., Kim, M., Yoonwoo, Y., Kim, K. K., Byun, J., Kim, S. J., Jeong, J., & Shin, H.-S. (2019). Neural circuits underlying a psychotherapeutic regimen for fear disorders. *Nature*, *566*(7744), 339–343. https://doi.org/10.1038/s41586-019-0931-y. Medline:30760920

Bergeron, S., Binik, Y. M., Khalifé, S., Pagidas, K., Glazer, H. I., Meana, M., & Amsel, R. (2001). A randomized comparison of group cognitive–behavioral therapy, surface electromyographic biofeedback, and vestibulectomy in the treatment of dyspareunia resulting from vulvar vestibulitis. *Pain*, *91*(3), 297–306. https://doi.org/10.1016/S0304-3959(00)00449-8. Medline:11275387

Bergeron, S., Corsini-Munt, S., Aerts, L., Rancourt, K., & Rosen, N. O. (2015). Female sexual pain disorders: A review of the literature on etiology and treatment. *Current Sexual Health Reports*, *7*(3), 159–169. https://doi.org/10.1007/s11930-015-0053-y

Bergeron, S., Khalifé, S., Glazer, H. I., & Binik, Y. M. (2008). Surgical and behavioral treatments for vestibulodynia: Two-and-one-half year follow-up and predictors of outcome. *Obstetrics and Gynecology*, *111*(1), 159–166. https://doi.org/10.1097/01.AOG.0000295864.76032.a7. Medline:18165405

Blair, K. L., Pukall, C. F., Smith, K. B., & Cappell, J. (2015). Differential associations of communication and love in heterosexual, lesbian, and bisexual women's perceptions and experiences of chronic vulvar and pelvic pain. *Journal of Sex and Marital Therapy*, *41*(5), 498–524. https://doi.org/10.1080/0092623X.2014.931315. Medline:24918840

Bohleber, W. (2018). Trauma and its consequences for the body and mind. In C. Charis & G. Panayiotou (Eds.), *Somatoform and other psychosomatic disorders* (pp. 107–120). Springer. https://doi.org/10.1007/978-3-319-89360-0_6

Bornstein, J., Goldstein, A. T., Stockdale, C. K., Bergeron, S., Pukall, C., Zolnoun, D., & Coady, D. (2016). 2015 ISSVD, ISSWSH, and IPPS consensus terminology and classification of persistent vulvar pain and vulvodynia. *The Journal of Lower Genital Tract Disease*, *20*(2), 126–130. https://doi.org/10.1097/LGT.0000000000000190. Medline:27002677

Brotto, L. A., Basson, R., Smith, K. B., Driscoll, M., & Sadownik, L. (2015). Mindfulness-based group therapy for women with provoked vestibulodynia. *Mindfulness*, *6*(3), 417–432. https://doi.org/10.1007/s12671-013-0273-z

Chapman, C. R., Tuckett, R., & Song, C. W. (2008). Pain and stress in a systems perspective: Reciprocal neural, endocrine and immune interactions. *The Journal of Pain*, *9*(2), 122–145. https://doi.org/10.1016/j.jpain.2007.09.006. Medline:18088561

Chen, I., Thavorn, K., Shen, M., Goddard, Y., Yong, P., MacRae, G. S., Nishi, C., Matar, A., & Allaire, C. (2017). Hospital-associated costs of chronic pelvic pain in Canada: A population-based descriptive study. *Journal of Obstetrics and Gynaecology Canada*, *39*(3), 174–180. https://doi.org/10.1016/j.jogc.2016.12.008. Medline:28343559

Chen, Y. R., Hung, K. W., Tsai, J. C., Chu, H., Chung, M. H., Chen, S. R., & Chou, K. R. (2014). Efficacy of eye-movement desensitization and reprocessing for patients with post-traumatic stress disorder: A meta-analysis of randomized controlled trials. *PLoS ONE*, *9*(8), 1–17. https://doi.org/10.1371/journal.pone.0103676. Medline:25101684

Corsini-Munt, S., Bergeron, S., Rosen, N. O., Mayrand, M. H., & Delisle, I. (2014). Feasibility and preliminary effectiveness of a novel cognitive behavioral couple therapy for provoked vestibulodynia: A pilot study. *The Journal of Sexual Medicine*, *11*(10), 2515–2527. https://doi.org/10.1111/jsm.12646. Medline:25059263

Courtois, C. A., Sonis, J., Brown, L. S., Cook, J., Fairbank, J. A., Friedman, M., Gone, J. P., Jones, R., La Greca, A., Mellman, T., Roberts, J., & Schulz, P. (2017). *Clinical practice guideline for the treatment of PTSD*. American Psychological Association. https://www.apa.org/ptsd-guideline/ptsd.pdf

De Jongh, A., Amann, B. L., Hofmann, A., Farrell, D., & Lee, C. W. (2019). The status of EMDR therapy in the treatment of posttraumatic stress disorder 30 years after its introduction. *Journal of EMDR Practice and Research*, *13*(4), 261–269. https://doi.org/10.1891/1933-3196.13.4.261

Desrochers, G., Bergeron, S., Landry, T., & Jodoin, M. (2008). Do psychosexual factors play a role in the etiology of provoked vestibulodynia? A critical review. *Journal of Sex and Marital Therapy*, *34*(3), 198–226. https://doi.org/10.1080/00926230701866083. Medline:18398760

Donaldson, R. L., & Meana, M. (2011). Early dyspareunia experience in young women: Confusion, consequences, and help-seeking barriers. *The Journal of Sexual Medicine*, *8*(3), 814–823. https://doi.org/10.1111/j.1743-6109.2010.02150.x. Medline:21143423

Dove, N. L., & Wiederman, M. W. (2000). Cognitive distraction and women's sexual functioning. *Journal of Sex and Marital Therapy*, *26*(1), 67–78. https://doi.org/10.1080/009262300278650. Medline:10693117

Dubé, J. P., Bergeron, S., Muise, A., Impett, E. A., & Rosen, N. O. (2017). A comparison of approach and avoidance sexual goals in couples with vulvodynia and community controls. *The Journal of Sexual Medicine*, *14*(11), 1412–1420. https://doi.org/10.1016/j.jsxm.2017.09.002. Medline:28964711

Engman, M., Wijma, K., & Wijma, B. (2010). Long-term coital behaviour in women treated with cognitive behaviour therapy for superficial coital pain and vaginismus. *Cognitive Behavioural Therapy*, *39*(3), 193–202. https://doi.org/10.1080/16506070903571014. Medline:20390584

Ford, J. D. (2018). Trauma memory processing in posttraumatic stress disorder psychotherapy: A unifying framework. *Journal of Traumatic Stress*, *31*(6), 933–942. https://doi.org/10.1002/jts.22344. Medline:30444287

Friedberg, F. (2004). Eye movement desensitization in fibromyalgia: A pilot study. *Complementary Therapies in Nursing and Midwifery*, *10*(4), 245–249. https://doi.org/10.1016/j.ctnm.2004.06.006. Medline:15519943

Friedrich, E. J. (1987). Vulvar vestibulitis syndrome. *The Journal of Reproductive Medicine*, *32*, 110–114. https://www.researchgate.net

Gates, E. A., & Galask, R. P. (2001). Psychological and sexual functioning in women with vulvar vestibulitis. *Journal of Psychosomatic Obstetrics and Gynaecology*, *22*(4), 221–228. https://doi.org/10.3109/01674820109049977. Medline:11840576

Giuliano, F., Rampin, O., & Allard, J. (2002). Neurophysiology and pharmacology of female genital sexual response. *Journal of Sex & Marital Therapy*, *28*(sup1), 101–121. https://doi.org/10.1080/00926230252851230. Medline:11898692

Granot, M., & Lavee, Y. (2005). Psychological factors associated with perception of experimental pain in vulvar vestibulitis syndrome. *Journal of Sex and Marital Therapy*, *31*(4), 285–302. https://doi.org/10.1080/00926230590950208. Medline:16020147

Grant, M., & Threlfo, C. (2002). EMDR in the treatment of chronic pain. *Journal of Clinical Psychology*, *58*(12), 1505–1520. https://doi.org/10.1002/jclp.10101. Medline:12455018

Graziottin, A. (2000). Libido: The biologic scenario. *Maturitas*, *34*, S9–S16. https://doi.org/10.1016/S0378-5122(99)00072-9. Medline:10759059

Hase, M., Balmaceda, U. M., Ostacoli, L., Liebermann, P., & Hofmann, A. (2017). The AIP model of EMDR therapy and pathogenic memories. *Frontiers in Psychology*, *8*, 1578. https://doi.org/10.3389/fpsyg.2017.01578. Medline:28983265

Haskell, L., & Randall, M. (2019). The impact of trauma on adult sexual assault victims. *Justice Canada*, 1–42. https://www.justice.gc.ca/eng/rp-pr/jr/trauma/trauma_eng.pdf

Haskell, S. G., Papas, R. K., Heapy, A., Reid, M. C., & Kerns, R. D. (2008). The association of sexual trauma with persistent pain in a sample of women veterans receiving primary care. *Pain Medicine*, *9*(6), 710–717. https://doi.org/10.1111/j.1526-4637.2008.00460.x. Medline:18565005

Heber, R., Kellner, M., & Yehuda, R. (2002). Salivary cortisol levels and the cortisol response to dexamethasone before and after EMDR: A case report. *Journal of Clinical Psychology*, *58*(12), 1521–1530. https://doi.org/10.1002/jclp.10102. Medline:12455019

Hill, M. D. (2020). Adaptive Information Processing Theory: Origins, principles, applications, and evidence. *Journal of Evidence-Based Social Work*, *17*(3), 317–331. https://doi.org/10.1080/26408066.2020.1748155. Medline:32420834

Jebelli, F., Maaroufi, M., Maracy, M. R., & Molaeinezhad, M. (2018). Effectiveness of eye movement desensitization and reprocessing (EMDR) on the sexual function of Iranian women with lifelong vaginismus. *Sexual and Relationship Therapy*, *33*(3), 325–338. https://doi.org/10.1080/14681994.2017.1323075

Kandyba, K., & Binik, Y. M. (2003). Hypnotherapy as a treatment for vulvar vestibulitis syndrome: A case report. *Journal of Sex and Marital Therapy*, *29*(3), 237–242. https://doi.org/10.1080/00926230390155122. Medline:12851128

Karatzias, T., Hyland, P., Bradley, A., Cloitre, M., Roberts, N. P., Bisson, J. I., & Shevlin, M. (2019). Risk factors and comorbidity of ICD-11 PTSD and complex PTSD: Findings from a trauma-exposed population based sample of adults in the United Kingdom. *Depression and Anxiety*, *36*(9), 887–894. https://doi.org/10.1002/da.22934. Medline:31268218

Kaysen, D., Resick, P. A., & Wise, D. (2003). Living in danger: The impact of chronic traumatisation and the traumatic context on posttraumatic stress disorder. *Trauma, Violence, and Abuse*, *4*(3), 247–264. https://doi.org/10.1177/1524838003004003004. Medline:14697125

Khan, A. M., Dar, S., Ahmed, R., Bachu, R., Adnan, M., & Kotapati, V. P. (2018). Cognitive behavioral therapy versus eye movement desensitization and reprocessing in patients with post-traumatic stress disorder: Systematic review and meta-analysis of randomized clinical trials. *Cureus*, *10*(9), 1–17. https://doi.org/10.7759/cureus.3250. Medline:30416901

Khandker, M., Brady, S. S., Stewart, E. G., & Harlow, B. L. (2014). Is chronic stress during childhood associated with adult-onset vulvodynia? *Journal of Women's Health*, *23*(8), 649–656. https://doi.org/10.1089/jwh.2013.4484. Medline:25046165

Khandker, M., Brady, S. S., Vitonis, A. F., MacLehose, R. F., Stewart, E. G., & Harlow, B. L. (2011). The influence of depression and anxiety on risk of adult onset vulvodynia. *Journal of Women's Health*, *20*(10), 1445–1451. https://doi.org/10.1089/jwh.2010.2661. Medline:21823918

Konuk, E., Epözdemir, H., Atçeken, Ş. H., Aydın, Y. E., & Yurtsever, A. (2011). EMDR treatment of migraine. *Journal of EMDR Practice and Research*, *5*(4), 166–176. https://doi.org/10.1891/1933-3196.5.4.166

Lamvu, G., Alappattu, M., Witzeman, K., Bishop, M., Robinson, M., & Rapkin, A. (2018). Patterns in vulvodynia treatments and 6-month outcomes for women enrolled in the national vulvodynia registry—An exploratory prospective study. *The Journal of Sexual Medicine*, *15*(5), 705–715. https://doi.org/10.1016/j.jsxm.2018.03.003. Medline:29631955

Landin-Romero, R., Moreno-Alcazar, A., Pagani, M., & Amann, B. L. (2018). How does eye movement desensitization and reprocessing therapy work? A systematic review on suggested mechanisms of action. *Frontiers in Psychology*, *9*, 1–23. https://doi.org/10.3389/fpsyg.2018.01395. Medline:30166975

Landry, T., & Bergeron, S. (2011). Biopsychosocial factors associated with dyspareunia in a community sample of adolescent girls. *Archives of Sexual Behavior*, *40*(5), 877–889. https://doi.org/10.1007/s10508-010-9637-9. Medline:20567891

Leclerc, B., Bergeron, S., Binik, Y. M., & Khalifé, S. (2010). History of sexual and physical abuse in women with dyspareunia: Association with pain, psychosocial adjustment, and sexual functioning. *The Journal of Sexual Medicine*, *7*(2), 971–980. https://doi.org/10.1111/j.1743-6109.2009.01581.x. Medline:19912492

Leclerc, B., Bergeron, S., Brassard, A., Bélanger, C., Steben, M., & Lambert, B. (2015). Attachment, sexual assertiveness, and sexual outcomes in women with provoked vestibulodynia and their partners: A mediation model. *Archives of Sexual Behavior*, *44*(6), 1561–1572. https://doi.org/10.1007/s10508-014-0295-1. Medline:24777439

Leeds, A. M. (2016). *Mediators, mechanisms and moderators of action for EMDR therapy: A review of multiplex effects in modes of bilateral stimulation*. EMDRIA Conference 2016, Minneapolis. http://www2.masterapp2.nl/assets/uploads/uploads/45561-Mechanisms-of-Action-Leeds.pdf

Leonard, L. M., & Follette, V. M. (2002). Sexual functioning in women reporting a history of child sexual abuse: Review of the empirical literature and clinical implications. *Annual Review of Sex Research*, *13*, 346–388. https://doi.org/10.1080/10532528.2002.10559809. Medline:12836736

Lerman, S. F., Zvia, R., Silviu, B., Hadar, S., & Golan, S. (2015). Longitudinal associations between depression, anxiety, pain, and pain-related disability in chronic pain patients. *Psychosomatic Medicine*, *77*(3), 333–341. https://doi.org/10.1097/PSY.0000000000000158. Medline:25849129

Letourneau, E. J., Resnick, H. S., Kilpatrick, D. G., Saunders, B. E., & Best, C. L. (1996). Comorbidity of sexual problems and posttraumatic stress disorder in female crime victims. *Behavior Therapy*, *27*(3), 321–336. https://doi.org/10.1016/S0005-7894(96)80020-7

Loeb, T. B., Williams, J. K., Carmona, J. V., Rivkin, I., Wyatt, G. E., Chin, D., & Asuan-O'Brien, A. (2002). Child sexual abuse: Associations with the sexual functioning of adolescents and adults. *Annual Reviews of Sex Research*, *13*, 307–345. https://doi.org/10.1080/10532528.2002.10559808. Medline:12836735

Maillé, D. L., Bergeron, S., & Lambert, B. (2014). Body image in women with primary and secondary provoked vestibulodynia: A controlled study. *The Journal of Sexual Medicine*, *12*(2), 505–515. https://doi.org/10.1111/jsm.12765. Medline:25394652

Masheb, R. M., Kerns, R. D., Lozano, C., Minkin, M. J., & Richman, S. (2009). A randomized clinical trial for women with vulvodynia: Cognitive behavioral therapy vs. supportive psychotherapy. *Pain*, *141*(1–2), 31–40. https://doi.org/10.1016/j.pain.2008.09.031. Medline:19022580

Maxfield, L. (2019). A clinician's guide to the efficacy of EMDR therapy. *Journal of EMDR Practice and Research*, *13*(4), 239–246. https://doi.org/10.1891/1933-3196.13.4.239

Mazzola, A., Calcagno, M. L., Goicochea, M. T., Pueyrredòn, H., Leston, J., & Salvat, F. (2009). EMDR in the treatment of chronic pain. *Journal of EMDR Practice and Research*, *3*(2), 66–79. https://doi.org/10.1891/1933-3196.3.2.66

Meston, C. M., & Frohlich, P. F. (2000). The neurobiology of sexual function. *Archives of General Psychiatry*, *57*(11), 1012–1030. https://doi.org/10.1001/archpsyc.57.11.1012. Medline:11074867

Najavits, L. M., Hyman, S. M., Ruglass, L. M., Hien, D. A., & Read, J. P. (2017). Substance use disorder and trauma. In S. N. Gold (Ed.), *APA handbook of trauma psychology: Foundations in knowledge* (pp. 195–213). American Psychological Association. https://doi.org/10.1037/0000019-012

Najman, J. M., Dunne, M. P., Purdie, D. M., Boyle, F. M., & Coxeter, P. D. (2005). Sexual abuse in childhood and sexual dysfunction in adulthood: An Australian population-based study. *Archives of Sexual Behaviour*, *34*(5), 517–526. https://doi.org/10.1007/s10508-005-6277-6. Medline:16211473

National Institute for Health Care and Excellence (NICE). (2018). *NICE guideline: Post-traumatic stress disorder*. NICE. https://www.nice.org.uk/guidance/ng116

Nguyen, R. H., Ecklund, A. M., Maclehose, R. F., Veasley, C., & Harlow, B. L. (2012). Co-morbid pain conditions and feelings of invalidation and isolation among women with vulvodynia. *Psychology, Health, and Medicine*, *17*(5), 589–598. https://doi.org/10.1080/13548506.2011.647703. Medline:22329615

Nia, N. G., Afrasiabifar, A., & Behnammoghadam, M. (2018). Comparing the effect of eye movement desensitization and reprocessing (EMDR) with guided imagery on pain severity in patients with rheumatoid arthritis. *Journal of Pain Research*, *11*, 2107–2113. https://doi.org/10.2147/JPR.S158981. Medline:30319285

Novo Navarro, P., Landin-Romero, R., Guardiola-Wanden-Berghe, R., Moreno-Alcázar, A., Valiente-Gómez, A., Lupo, W., Garcia, F., Fernandez, I., Perez, V., & Amann, B. L. (2018). 25 years of eye movement desensitization and reprocessing (EMDR): The EMDR therapy protocol, hypotheses of its mechanism of action and a systematic review of its efficacy in the treatment of post-traumatic stress disorder. *Revista de Psiquiatria y Salud Mental—Journal of Psychiatry and Mental Health*, *11*, 101–114. https://doi.org/10.1016/j.rpsm.2015.12.002. Medline:26877093

Nylanderlundqvist, E. N., & Bergdahl, J. (2003). Vulvar vestibulitis: Evidence of depression and state anxiety in patients and partners. *Acta Dermato-Venereologica*, *83*(5), 369–373. https://doi.org/10.1080/00015550310003764. Medline:14609107

Oren, E., & Solomon, R. (2012). EMDR therapy: An overview of its development and mechanisms of action. *European Review of Applied Psychology*, *62*(4), 197–203. https://doi.org/10.1016/j.erap.2012.08.005

Pagani, M., Di Lorenzo, G., Verardo, A., Nicolais, G., Monaco, L., Lauretti, G., Russo, R., Niolu, C., Ammaniti, M., Fernandez, I., & Siracusano, A. (2012). Neurobiological correlates of EMDR monitoring—An EEG study. *PLoS ONE*, *7*(9), e45753. https://doi.org/10.1371/journal.pone.0045753. Medline:23049852

Pâquet, M., Rosen, N., Steben, M., & Bergeron, S. (2018). Does anxiety and depressive symptoms are associated with pain and its consequences? A daily diary study among couples coping with vulvodynia. *The Journal of Pain*, *19*(3), S106. https://doi.org/10.1016/j.jpain.2017.12.251

Pascoal, P. M., Rosa, P. J., Silva, E. P. D., & Nobre, P. J. (2018). Sexual beliefs and sexual functioning: The mediating role of cognitive distraction. *International Journal of Sexual Health*, *30*(1), 60–71. https://doi.org/10.1080/19317611.2018.1424064

Payne, K. A., Binik, Y. M., Amsel, R., & Khalifé, S. (2005). When sex hurts, anxiety and fear orient attention towards pain. *European Journal of Pain*, *9*(4), 427. https://doi.org/10.1016/j.ejpain.2004.10.003. Medline:15979023

Pazmany, E., Bergeron, S., Verhaeghe, J., Van Oudenhove, L., & Enzlin, P. (2014). Sexual communication, dyadic adjustment, and psychosexual well-being in premenopausal women with self-reported dyspareunia and their partners: A controlled study. *The Journal of Sexual Medicine*, *11*(7), 1786–1797. https://doi.org/10.1111/jsm.12518. Medline:24690206

Pillai-Friedman, S. (2010). EMDR protocol for treating sexual dysfunction. In M. Luber (Ed.), *Eye movement desensitization (EMDR) scripted protocols: Special populations* (pp. 151–166). Springer Publishing Co.

Ponte, M., Klemperer, E., Sahay, A., & Chren, M. M. (2009). Effects of vulvodynia on quality of life. *Journal of the American Academy of Dermatology*, *60*(1), 70–76. https://doi.org/10.1016/j.jaad.2008.06.032. Medline:19022532

Postma, R., Bicanic, I., van der Vaart, H., & Laan, E. (2013). Pelvic floor muscle problems mediate sexual problems in young adult rape victims. *The Journal of Sexual Medicine*, *10*(8), 1978–1987. https://doi.org/10.1111/jsm.12196. Medline:23679151

Pukall, C. F., Binik, Y. M., Khalifé, S., Amsel, R., & Abbott, F. V. (2002). Vestibular tactile and pain thresholds in women with vulvar vestibulitis syndrome. *Pain*, *96*(1–2), 163–175. https://doi.org/10.1016/S0304-3959(01)00442-0. Medline:11932072

Pukall, C., Kandyba, K., Amsel, R., Khalifé, S., & Binik, Y. (2007). Sexual pain disorders: Effectiveness of hypnosis for the treatment of vulvar vestibulitis syndrome: A preliminary investigation. *The Journal of Sexual Medicine*, *4*(2), 417–425. https://doi.org/10.1111/j.1743-6109.2006.00425.x. Medline:17367437

Reed, B. D., Harlow, S. D., Sen, A., Legocki, L. J., Edwards, R. M., Arato, N., & Haefner, H. K. (2012). Prevalence and demographic characteristics of vulvodynia in a population-based sample. *American Journal of Obstetrics and Gynecology*, *206*(2), 1–9. https://doi.org/10.1016/j.ajog.2011.08.012. Medline:21963307

Reissing, E. D., Binik, Y. M., Khalif, S., Cohen, D., & Amsel, R. (2003). Etiological correlates of vaginismus: Sexual and physical abuse, sexual knowledge, sexual self-schema, and relationship adjustment. *Journal of Sex and Marital Therapy*, *29*(1), 47–59. https://doi.org/10.1080/713847095. Medline:12519667

Rolls, E. T. (2019). The cingulate cortex and limbic systems for emotion, action, and memory. *Brain Structure and Function*, *224*, 1–18. https://doi.org/10.1007/s00429-019-01945-2. Medline:31451898

Rome Jr., H. P., & Rome, J. D. (2001). Limbically Augmented Pain Syndrome (LAPS): Kindling, corticolimbic sensitization, and the convergence of affective and sensory symptoms in chronic pain disorders. *Pain Medicine*, *1*(1), 7–23. https://doi.org/10.1046/j.1526-4637.2000.99105.x. Medline:15101960

Rostaminejad, A., Behnammoghadam, M., Rostaminejad, M., Behnammoghadam, Z., & Bashti, S. (2017). Efficacy of eye movement desensitization and reprocessing on the phantom limb pain of patients with amputations within a 24-month follow-up. *International Journal of Rehabilitation Research*, *40*(3), 209–214. https://doi.org/10.1097/MRR.0000000000000227. Medline:28368869

Sack, M., Lempa, W., Steinmetz, A., Lamprecht, F., & Hofmann, A. (2008). Alterations in autonomic tone during trauma exposure using eye movement desensitization and reprocessing (EMDR)—Results of a preliminary investigation. *Journal of Anxiety Disorders*, *22*(7), 1264–1271. https://doi.org/10.1016/j.janxdis.2008.01.007. Medline:18314305

Sadownik, L. A. (2000). Clinical profile of vulvodynia patients. A prospective study of 300 patients. *The Journal of Reproductive Medicine*, *45*(8), 679–684. https://www.researchgate.net. Medline:10986689

Salonia, A., Giraldi, A., Chivers, M. L., Georgiadis, J. R., Levin, R., Maravilla, K. R., & McCarthy, M. M. (2010). Physiology of women's sexual function: Basic knowledge and new findings. *Journal of Sexual Medicine*, *7*(8), 2637–2660. https://doi.org/10.1111/j.1743-6109.2010.01810.x. Medline:20487242

Shapiro, F. (2007). EMDR, adaptive information processing, and case conceptualization. *Journal of EMDR Practice and Research*, *1*, 68–87. https://doi.org/10.1891/1933-3196.1.2.68

Shapiro, F. (2014). The role of eye movement desensitization and reprocessing (EMDR) therapy in medicine: Addressing the psychological and physical symptoms stemming from adverse life experiences. *The Permanente Journal*, *18*(1), 71. https://doi.org/10.7812/TPP/13-098. Medline:24626074

Shapiro, F. (2018). *Eye movement desensitization and reprocessing (EDMR) therapy: Basic principles, protocols, and procedures*. The Guilford Press.

Shapiro, F., & Laliotis, D. (2011). EMDR and the adaptive information processing model: Integrative treatment and case conceptualization. *Clinical Social Work Journal*, *39*, 191–200. https://doi.org/10.1007/s10615-010-0300-7

Smith, K. B., & Pukall, C. F. (2014). Sexual function, relationship adjustment, and the relational impact of pain in male partners of women with provoked vulvar pain. *The Journal of Sexual Medicine*, *11*(5), 1283–1293. https://doi.org/10.1111/jsm.12484. Medline:24612656

Solomon, E. P., & Heide, K. M. (2005). The biology of trauma: Implications for treatment. *Journal of Interpersonal Violence*, *20*(1), 51–60. https://doi.org/10.1177/0886260504268119. Medline:15618561

Solomon, R. M., & Shapiro, F. (2008). EMDR and the adaptive information processing model: Potential mechanisms of change. *Journal of EMDR Practice and Research*, *2*(4), 315–325. https://doi.org/10.1891/1933-3196.2.4.315

Stout, M. E., Meints, S. M., & Hirsh, A. T. (2018). Loneliness mediates the relationship between pain during intercourse and depressive symptoms among young women. *Archives of Sexual Behavior*, *47*(6), 1687–1696. https://doi.org/10.1007/s10508-017-1138-7. Medline:29511895

Sutton, K. S., Boyer, S. C., Goldfinger, C., Ezer, P., & Pukall, C. F. (2012). To lube or not to lube: Experiences and perceptions of lubricant use in women with and without dyspareunia. *Journal of Sexual Medicine*, *9*, 240–250. https://doi.org/10.1111/j.1743-6109.2011.02543.x

Ter Kuile, M. M., Melles, R., de Groot, H. E., Tuijnman-Raasveld, C. C., & van Lankveld, J. J. (2013). Therapist-aided exposure for women with lifelong vaginismus: A randomized waiting-list control trial of efficacy. *Journal of Consulting and Clinical Psychology*, *81*(6), 1127–1136. https://doi.org/10.1037/a0034292. Medline:24060195

Terpou, B., Harricharan, S., McKinnon, M., Frewen, P., Jetly, R., & Lanius, R. (2019). The effects of trauma on brain and body: A unifying role for the midbrain periaqueductal gray. *Journal of Neuroscience Research*, *97*(9), 1110–1140. https://doi.org/10.1002/jnr.24447. Medline:31254294

Tesarz, J., Leisner, S., Gerhardt, A., Janke, S., Seidler, G. H., Eich, W., & Hartmann, M. (2014). Effects of eye movement desensitization and reprocessing (EMDR) treatment in chronic pain patients: A systematic review. *Pain Medicine*, *15*(2), 247–263. https://doi.org/10.1111/pme.12303. Medline:24308821

Tesarz, J., Wicking, M., Bernardy, K., & Seidler, G. H. (2019). EMDR therapy's efficacy in the treatment of pain. *Journal of EMDR Practice and Research*, *13*(4), 337–344. https://doi.org/10.1891/1933-3196.13.4.337

Thomtén, J. (2014). Living with genital pain: Sexual function, satisfaction, and help-seeking among women living in Sweden. *Scandinavian Journal of Pain*, *5*(1), 19–25. https://doi.org/10.1016/j.sjpain.2013.10.002. Medline:29913665

Torun, F. (2010). Treatment of vaginismus with EMDR: A report of two cases. *Turkish Journal of Psychiatry*, *21*(3), 243–248. https://www.researchgate.net. Medline:20818512

van Berlo, W., & Ensink, B. (2000). Problems with sexuality after sexual assault. *Annual Review of Sex Research*, *11*, 235–257. https://doi.org/10.1080/10532528.2000.10559789. Medline:11351833

van den Hout, M., & Barlow, D. (2000). Attention, arousal and expectancies in anxiety and sexual disorders. *Journal of Affective Disorders*, *61*, 241–256. https://doi.org/10.1016/S0165-0327(00)00341-4. Medline:11163425

van der Kolk, B. A., Spinazzola, J., Blaustein, M. E., Hopper, J. W., Hopper, E. K., Korn, D. L., & Simpson, W. B. (2007). A randomized clinical trial of eye movement desensitization and reprocessing (EMDR), fluoxetine, and pill placebo in the treatment of posttraumatic stress disorder: Treatment effects and long-term maintenance. *Journal of Clinical Psychiatry*, *68*(1), 37. https://doi.org/10.4088/jcp.v68n0105. Medline:17284128

Vogt, B. A., Berger, G. R., & Derbyshire, S. W. (2003). Structural and functional dichotomy of human midcingulate cortex. *European Journal of Neuroscience*, *18*(11), 3134–3144. https://doi.org/10.1111/j.1460-9568.2003.03034.x

Ward, E., & Ogden, J. (1994). Experiencing vaginismus—Sufferers beliefs about causes and effects. *Sexual and Marital Therapy*, *9*(1), 33–45. https://doi.org/10.1080/02674659408409565

Wilson, G., Farrell, D., Barron, I., Hutchins, J., Whybrow, D., & Kiernan, M. D. (2018). The use of eye-movement desensitization reprocessing (EMDR) therapy in treating post-traumatic stress disorder—A systematic narrative review. *Frontiers in Psychology*, *9*, 923. https://doi.org/10.3389/fpsyg.2018.00923. Medline:29928250

Workman, E. A., Hubbard, J. R., & Felker, B. L. (2002). Comorbid psychiatric disorders and predictors of pain management program success in patients with chronic pain. *Primary Care Companion to the Journal of Clinical Psychiatry*, *4*(4), 137–140. https://doi.org/10.4088/pcc.v04n0404. Medline:15014721

World Health Organization (WHO). (2013). *Guidelines for the management of conditions specifically related to stress*. WHO. https://www.who.int/mental_health/emergencies/stress_guidelines/en/

Yehuda, R., Lehrner, A., & Rosenbaum, T. Y. (2015). PTSD and sexual dysfunction in men and women. *The Journal of Sexual Medicine*, *12*(5), 1107–1119. https://doi.org/10.1111/jsm.12856. Medline:25847589