Sleep Hypn 2017;19(3):70-77
http://dx.doi.org/10.5350/Sleep.Hypn.2017.19.0146

Sleep and Hypnosis
A Journal of Clinical Neuroscience and Psychopathology

ORIGINAL ARTICLE

Comparison of Eye Movement Desensitization and Reprocessing (EMDR) and Duloxetine Treatment Outcomes in Women Patients with Somatic Symptom Disorder

Onur Okan Demirci[1], Eser Sağaltıcı[2], Abdullah Yıldırım[3*], Murat Boysan[4]

[1]Department of Psychology, İstanbul Gelişim University, Istanbul, Turkey
[2]Psychiatry Clinics of Bağcılar Training and Education Hospital, Istanbul, Turkey
[3]Department of Psychiatry, Yüzüncü Yıl University School of Medicine, Van, Turkey
[4]Department of Psychology, Yüzüncü Yıl University, Van, Turkey

ABSTRACT
Somatic symptom disorder (SSD) is a debilitating disorder that significantly diminishes quality of life and causes psychological distress such as anxiety and depression. The paper explored the efficiency of the eye movement desensitization and reprocessing (EMDR) therapy in SSD. The current investigation is a clinical trial investigating the effectiveness of eye movement desensitization (EMDR) therapy in the treatment of 31 first-diagnosed SSD patients in comparison to age, education and marital status matched 31-first-diagnosed SSD patients who received duloxetine over a 6-week course of treatment. Somatization subscale of the Symptom Checklist-Revised 90 (SCL-90), Beck Anxiety Inventory (BAI), Beck Depression Inventory (BDI), and Short Form Health Survey (SF-36) were administered to the participants. EMDR group showed enhanced improvement relative to baseline after 6 weeks of treatment compared to duloxetine group. We concluded that EMDR appears to be a highly promising therapy and should be considered among the first-line interventions in the treatment of SSD.
Keywords: Somatoform disorders, Treatment efficacy, Clinical trial, Selective serotonin and norepinephrine reuptake inhibitor (SNRI), Quality of life, Emotion dysregulation

INTRODUCTION

In the fifth revision of the Diagnostic and Statistical Manual of Mental Disorders, somatoform disorders section was removed and a new section of somatic symptom and related disorders capturing somatic symptom disorder, illness anxiety disorder, conversion disorder, factitious disorder, and psychological factors affecting other medical conditions was defined (Rief & Martin, 2014; Voigt et al., 2012). The definition of somatic symptom disorder stipulates six months of at least one distressing or disruptive somatic symptom that causes disproportionate and persistent thoughts or anxiety or that takes up excessive time and energy for a principal diagnosis. Even though not clearly known, the prevalence of somatic symptom disorder in general adult population is expected to be around 5% - 7% (American Psychiatric Association, 2013).

***Correspondence:** yldrmabdullah@yahoo.com
Dr. Abdullah Yıldırım, Department of Psychiatry, Yüzüncü Yıl University School of Medicine, Van, Turkey
Phone: +90 432 4445065 Fax: +90 4322167519

Sleep and Hypnosis
Journal homepage:
www.sleepandhypnosis.org

Given that no single treatment has proven outperform another treatment for a single subtype of somatic symptom disorders, it has been suggested that the selection and intensity of the intervention should be drawn from the severity and complexity of the disorder (Schroder et al., 2012). Three groups of antidepressants are particularly considered in pharmacological interventions relevant to somatic disorders. These antidepressants are tricyclic antidepressants (TCAs; e.g., amitriptyline, desimipramine, trimipramine, doxepine, opipramol), selective serotonin reuptake inhibitors (SSRIs; e.g., citalopram, escitalopram, sertraline, paroxetine, fluvoxamine or fluoxetine), and selective serotonin and norepinephrine reuptake inhibitors (SNRIs; e.g. venlafaxine, duloxetine) (Kleinstauber et al., 2015). Systematic reviews of treatment interventions in somatic disorders have consistently concluded that nonpharmacological approaches such as psychotherapy appear to be more effective than pharmacological treatments (Hauser, Bernardy, Arnold, Offenbacher, & Schiltenwolf, 2009; Henningsen, Zipfel, & Herzog, 2007; Wulsin, 2014).

Recent conceptualizations of pain place importance on the processes taking place in the brain, i.e. cortical reorganization, cognitive and motivation factors (Flor, 2002; Flor, Denke, Schaefer, & Grusser, 2001; Karl, Muhlnickel, Kurth, & Flor, 2004; Price, 2000; Turk, 2003). Of note is the fact that affective component of the noniceptive sensations has not been sufficiently taken into account in the previous models of chronic pain (Ray & Zbik, 2001). More recent models hold the premise that the role of the emotion is central in the genesis and maintenance of chronic pain and in turn suggest that treatment should be tailored in a manner addressing the emotional component of noniceptive sensations (Price, 2000; Rome & Rome, 2000; Schneider, Hofmann, Rost, & Shapiro, 2007; van Rood & de Roos, 2009).

Eye movement desensitization and reprocessing (EMDR) is built on the adaptive information processing (AIP) model, which posits that prior affect-laden traumatic experiences result in various patterns of symptoms such as flashbacks, physical sensations and chronic pain (Shapiro, 2001). In accordance with the extant literature of pain (Ray & Zbik, 2001; Rome & Rome, 2000), the AIP model prospects that particularly chronic pain is related to past traumatic experiences, which is assumed to be limbically augmented during the sensitization process (Shapiro, 2014). More importantly, in review of the literature strong evidence with respect to the utilization of EMDR in the treatment of chronic pain has been emerged (Bergmann, 1998; Grant, 1998; Grant & Threlfo, 2002; Schneider et al., 2007; Schneider, Hofmann, Rost, & Shapiro, 2008).

The focus of the current study was to compare the effectiveness of EMDR and duloxetine in the treatment of patients with somatic symptom disorder. It was hypothesized that painful memories are the antecedents of limbically augmented somatic symptomatology, in which EMDR can be used to reprocess and change somatic reactions to emotionally charged memories linked to somatization.

METHOD

Participants

The trial involved 62 first-time-diagnosed patients with somatic symptom disorder (SSD) consecutively admitted to the psychiatry clinics of Yüzüncü Yıl University Training and Education Hospital and Bağcılar Training and Education Hospital due to the medically unexplained physical symptoms.

Patients were included into the study after being thoroughly informed about the research protocol and providing written informed consent for participation. Inclusion criteria were voluntary agreement of participation, first-time diagnosis based on DSM-5 criteria for SSD, age 18> and 65< years, and no history of other psychiatric problems.

Participants were randomized utilizing the SCL-90 somatization subscale score of each patient with SSD determined at baseline, before commencement of the trial, to one of 2 treatment modalities: 1) EMDR alone or 2) duloxetine alone, so as to minimize group difference in mean somatization score. The study required nearly 1 year to complete since the aim of the study was to recruit

only patients diagnosed for the first time with SSD who had not received any psychotherapy or pharmacotherapy before.

The study was conducted according to the Declaration of Helsinki. All investigative procedures were reviewed and approved by the Institutional Ethics Committee of the Yüzüncü Yıl University, Faculty of Medicine. All participants signed a consent form declaring that they had been fully informed about the purposes, procedures, and conduct of the study. The volunteers were not compensated for their participation.

Treatment Protocols

Half of the women patients (n=31) with SSD received duloxetine treatment alone and no other therapies were provided during the study period. The other half of the sample matched for age, marital status and education was treated with EMDR alone and no other therapies or pharmacotherapy was provided to EMDR group.

Duloxetine, a serotonin norepinephrine reuptake inhibitor (SNRI), was started at a dose of 30 mg/day, always in the morning, for the first week of the trial and thereafter, from the second week of the trial provided at a dose of 60 mg/day.

EMDR treatment consisted of 6 weekly sessions lasting 90 minutes. The EMDR sessions were tailored according to the treatment guidelines for somatic symptomatology (Luber, 2009; Schneider et al., 2007) that were adapted from the basic EMDR protocol developed by Shapiro (2001). During the EMDR sessions although eight step standard protocol was followed by the therapists, somatic sensations and relevant painful memories became the focus of the therapeutic intervention. The antecedents of somatic sensations and affective components of the physical symptoms were targeted and reprocessed during the EMDR sessions.

Outcome variables

A battery of self-report instruments evaluating health well-being, somatization, depression and anxiety levels was administered at the beginning and at the end of the treatment. Self-report measures included the following.

Somatization subscale of the Symptom Checklist-90-Revised (SCL-90-R)

The SCL-90 R (Derogatis, 1977) is a brief self-report questionnaire developed to assess a broad range of psychological symptoms of psychopathology. The questionnaire is also used in measuring improvement in symptoms as outcomes of pharmacological and psychotherapy treatments. We used only somatization subscale of the SCL-90 R in the present study. The somatization subscale consists of 12 items. The Turkish validation of the psychometric instrument was conducted by Kılıç (1991).

Beck Anxiety Inventory (BAI)

The BDI (Beck, Brown, Epstein, & Steer, 1988) was developed to assess frequency and intensity of physiological symptoms of anxiety. The instrument consists of 21 items, each rated on a four-point scale from 0 to 3. The BAI yields a total score ranging from 0 to 63, with higher scores indicating more severe anxiety symptoms. The Turkish version of the BAI was demonstrated to have good reliability and validity (Ulusoy, Sahin, & Erkmen, 1998).

Beck Depression Inventory (BDI)

The BDI (Beck, Rush, Shaw, & Emery, 1979) is designed to assesses frequency and intensity of depressive symptoms. The instrument consists of 21 items, each rated on a four-point scale from 0 to 3. The BDI yields a total score ranging from 0 to 63, with higher scores indicating more severe depressive symptoms. The Turkish version of the instrument had adequate reliability and validity (Hisli, 1989).

Short Form Health Survey (SF-36)

The SF-36 (Ware & Sherbourne, 1992) is one of the most widely used screening tool developed to assess health status and quality of life. The instrument consists of 36 items that yield ten domains. Physical Functioning assesses problems with physical activities. The Role-Physical and Role-Emotional domains measure debilitation at work or other daily activities as a result of physical health or emotional problems. Bodily Pain assesses

limitations due to pain, and Vitality measures energy and tiredness. The Social Function domain evaluates functioning relevant to physical and emotional health on normal social activities, and Mental Health assesses psychological wellness. The General Health domain evaluates perception and expectation of personal health. These subscales are assumed to form two distinct higher-order clusters of Physical and Mental Components. All domains are scored on a scale from 0 to 100 and the scores are standardized with a mean of 50 and a standard deviation of 10. Three subscales (Physical Function, Physical Role, and Bodily Pain) contribute to the scoring of the Physical Component Summary Measure and three subscales of mental functioning (Role-Emotion, Social Function, and Mental Health) contribute to the scoring of the Mental Component Summary Measure. The Turkish translation of the SF-36 was conducted by Demiral et al. (2006).

Statistical Analysis

Descriptive statistics were derived for demographic variables and sample characteristics were compared between EMDR and duloxetine treatments groups using F test and χ^2 test statistics. The mean scale scores of the 2 treatment groups measured at pre- and post-treatment periods were compared using one-way analysis of variance. Repeated-measures analysis of variance (rANOVA) models were run to evaluate change on psychometric instrument scores obtained over 6 weeks of the treatment. The threshold for statistical significance was $P<0.05$.

RESULTS

All 62 women patients with SSD completed the trial; 31 patients received duloxetine alone and 31 patients received EMDR without pharmacotherapy. The mean age of the overall sample (62 patients) was 28.02 (SD ± 6.32) years, ranging from 18 to 39. Some 53.23% of the participants were married, and 38.71% had college education. As shown in Table 1, the mean age, level of education and marital status did not differ according to the treatment group (ANOVA and χ^2 tests).

Table 2 and 3 report the mean baseline and follow-up scale scores of the 2 treatment groups. The mean scale scores were comparable between 2 treatment groups at the beginning of the treatment, with an exception of that the mean baseline BAI score was statistically significantly greater in the EMDR therapy group than duloxetine group.

The mean scale scores of the somatization subscale of the SCL-90 R, BAI, BDI, and components of the SF-36 of both treatment groups significantly declined during the 6-week protocol. The mean somatization scale score of EMDR group was better reduced from baseline than duloxetine alone group. More importantly, it was the case for the BDI, BAI, and subscales of the SF-36. Accordingly, over the 6-week course of therapy, reduction of the mean scale scores was indicative of the enhanced therapeutic effect of EMDR observed at the end of the trial, in comparison to duloxetine treated patients. Findings are presented in Table 2 and 3.

Table 1. Socio-demographic characteristics

		Treatment					
		EMDR n=31		Duloxetine n=31			
		Mean	SD	Mean	SD	F(1, 60)	P
Age		27.65	5.81	28.48	6.86	0.270	0.605
		N	%	N	%	χ^2 (1)	P
Marital Status	Single	15	48.39	14	45.16	0.065	0.799
	Married	16	51.61	17	54.84		
Education	High school	21	67.74	17	54.84	1.088	0.297
	University	10	32.26	14	45.16		

Note. Eye Movement Desensitization and Reprocessing

Table 2. One-way ANOVA comparisons between treatment groups

		Treatment						
		EMDR n=31		Duloxetine n=31				
		Mean	SD	Mean	SD	F (1, 60)	P	η^2
Somatization	Baseline	26.58	4.49	26.00	3.38	0.332	0.567	0.005
Somatization	Post-treatment	5.03	4.96	19.35	3.50	172.483	**<0.001**	0.742
Beck Anxiety Inventory	Baseline	25.71	6.94	11.87	5.36	77.239	**<0.001**	0.563
Beck Anxiety Inventory	Post-treatment	3.90	2.89	8.48	3.44	32.177	**<0.001**	0.349
Beck Depression Inventory	Baseline	23.19	9.82	19.03	10.19	2.681	0.107	0.043
Beck Depression Inventory	Post-treatment	4.35	3.77	13.84	6.47	49.693	**<0.001**	0.453
Physical function	Baseline	43.71	23.84	37.10	19.27	1.443	0.234	0.023
Physical function	Post-treatment	84.03	11.43	47.74	13.77	127.412	**<0.001**	0.680
Role function	Baseline	0.00	0.00	0.00	0.00	-	-	-
Role function	Post-treatment	90.32	26.36	28.23	25.61	88.493	**<0.001**	0.596
Body pain	Baseline	27.61	18.11	25.65	15.07	0.216	0.644	0.004
Body pain	Post-treatment	83.55	15.52	43.58	13.55	116.598	**<0.001**	0.660
General health	Baseline	22.00	17.98	22.32	20.20	0.004	0.947	0.000
General health	Post-treatment	74.58	13.23	37.84	16.23	95.402	**<0.001**	0.614
Physical component	Baseline	31.06	7.46	28.80	5.88	1.752	0.191	0.028
Physical component	Post-treatment	52.15	4.88	35.48	5.44	161.239	**<0.001**	0.729
Vitality	Baseline	23.06	16.96	19.52	16.60	0.693	0.409	0.011
Vitality	Post-treatment	72.90	13.46	34.03	15.35	112.328	**<0.001**	0.652
Social function	Baseline	31.05	20.38	30.24	18.19	0.027	0.870	0.000
Social function	Post-treatment	81.85	16.72	45.97	15.27	77.860	**<0.001**	0.565
Role emotion	Baseline	0.00	0.00	3.23	13.21	1.849	0.179	0.030
Role emotion	Post-treatment	91.07	25.15	29.03	30.73	75.705	**<0.001**	0.558
Mental health	Baseline	30.32	14.08	35.61	14.55	2.117	0.151	0.034
Mental health	Post-treatment	72.13	12.46	45.81	8.69	93.087	**<0.001**	0.608
Mental component	Baseline	26.17	5.09	28.30	6.04	2.260	0.138	0.036
Mental component	Post-treatment	51.08	6.71	34.95	6.75	88.998	**<0.001**	0.597

Note. Significant P values are boldfaced.

DISCUSSION

The therapeutic response to antidepressant medications is often delayed up to 4-6 weeks (Stahl, 2013). A meta-analysis of 27 studies, consisting of a total of 1781 participants who has received short-term psychotherapy for multiple medically unexplained physical symptoms identified small to large within-group effect sizes for repeated assessments for the different outcome variables. Researchers concluded that psychotherapy seem to play an important role in the treatment of physical symptoms relative to pharmacotherapy that facilitate passivity of patients, support somatic health beliefs and convey the risk of side effects (Kleinstauber, Witthoft, & Hiller, 2011) . Thus, strategies to improve the strength and extent of the therapeutic outcomes in somatic disorders are the major clinical interest. The current study explored whether an enhanced and a more rapid therapeutic effect is obtained in women SSD patients when EMDR was administered over a six-week course of the treatment than when duloxetine antidepressant pharmacotherapy is administered alone in the morning. The results of the current follow-up study showed that SSD patients who received EMDR therapy versus those patients with SSD who received duloxetine alone experienced significantly sheerer reduction of not only somatization as measured on the respective subscale of the SCL-90, but also the BDI, BAI, and the SF-36 outcome measures, including all subscales of the SF-36. Moreover, any adverse effects of EMDR such as prolonged sleep terrors or inflated anxiety were not reported by the patients.

In a systematic review of the relevant literature, Shapiro (2014) places emphasize on the beneficial implications of EMDR in that many patients suffering from somatization and chronic pain who may actually

Table 3. Repeated-measure one-way ANOVA comparisons between mean scale scores measured at pre-treatment and post-treatment

		Baseline			Post-treatment				
		n	Mean	SD	Mean	SD	F (1, 30)	P	η^2
Somatization	EMDR	31	26.58	4.49	5.03	4.96	477.858	**<0.001**	0.941
	Duloxetine	31	26.00	3.38	19.35	3.50	63.074	**<0.001**	0.678
Beck Anxiety Inventory	EMDR	31	25.71	6.94	3.90	2.89	310.375	**<0.001**	0.912
	Duloxetine	31	11.87	5.36	8.48	3.44	44.951	**<0.001**	0.600
Beck Depression Inventory	EMDR	31	23.19	9.82	4.35	3.77	144.875	**<0.001**	0.828
	Duloxetine	31	19.03	10.19	13.84	6.47	21.172	**<0.001**	0.414
Physical function	EMDR	31	43.71	23.84	84.03	11.43	106.886	**<0.001**	0.781
	Duloxetine	31	37.10	19.27	47.74	13.77	25.474	**<0.001**	0.459
Role function	EMDR	31	0.00	0.00	90.32	26.36	363.946	**<0.001**	0.924
	Duloxetine	31	0.00	0.00	28.23	25.61	37.654	**<0.001**	0.557
Body pain	EMDR	31	27.61	18.11	83.55	15.52	249.297	**<0.001**	0.893
	Duloxetine	31	25.65	15.07	43.58	13.55	27.996	**<0.001**	0.483
General health	EMDR	31	22.00	17.98	74.58	13.23	145.007	**<0.001**	0.829
	Duloxetine	31	22.32	20.20	37.84	16.23	23.026	**<0.001**	0.434
Physical component	EMDR	31	31.06	7.46	52.15	4.88	219.364	**<0.001**	0.880
	Duloxetine	31	28.80	5.88	35.48	5.44	41.680	**<0.001**	0.581
Vitality	EMDR	31	23.06	16.96	72.90	13.46	171.441	**<0.001**	0.851
	Duloxetine	31	19.52	16.60	34.03	15.35	31.019	**<0.001**	0.508
Social function	EMDR	31	31.05	20.38	81.85	16.72	192.359	**<0.001**	0.865
	Duloxetine	31	30.24	18.19	45.97	15.27	23.766	**<0.001**	0.442
Role emotion	EMDR	31	0.00	0.00	91.07	25.15	406.617	**<0.001**	0.931
	Duloxetine	31	3.23	13.21	29.03	30.73	28.682	**<0.001**	0.489
Mental health	EMDR	31	30.32	14.08	72.13	12.46	153.534	**<0.001**	0.837
	Duloxetine	31	35.61	14.55	45.81	8.69	23.808	**<0.001**	0.442
Mental component	EMDR	31	26.17	5.09	51.08	6.71	282.660	**<0.001**	0.904
	Duloxetine	31	28.30	6.04	34.95	6.75	38.104	**<0.001**	0.560

Note. Significant P values are boldfaced; EMDR= Eye Movement Desensitization and Reprocessing

debilitated by unprocessed painful memories encoded along with the somatic sensations. The adaptive Information Process (AIP) model holds that chronic pain is assumed to involve the automatic emotional reactions in response to the sensations elicited by nociceptive receptors. Pain reactions also may be stimulated by physiologically stored memories of similar sensations, which is suggested to contain images and thoughts as well as physical sensations. Adverse memories may convey affective aspects of traumatic experiences that are probably out of conscious awareness and are significantly associated with pain or somatization. The prospect of the AIP model includes EMDR therapy can result in completely elimination of the stressful somatic perception. The previous studies of EMDR have provided robust evidence empirically supporting the theoretical considerations of the AIP model that EMDR therapy for phantom limb pain which is assumed to be caused by the unprocessed painful memories containing the physical sensations during the time of the event indicate an excessive success rate as defined by almost complete elimination of the painful somatic sensations (de Roos et al., 2010; Russell, 2008; Schneider et al., 2008; Wilensky, 2006). Completed processing of the memory through is premised to include an integration and reconsolidation of the originally stored memory that results in alterations in emotions, beliefs and bodily sensations (Shapiro, 2001, 2007; Solomon & Shapiro, 2008). Therefore, EMDR therapy is beneficial in the treatment of chronic pain and somatic symptoms.

Consistent with accumulated evidence in the literature supporting the potent efficacy of EMDR in the treatment of somatic symptoms (Kleinstauber et al., 2011; Tefft & Jordan, 2016; Tesarz et al., 2014) the present results provided further support and extended the relevant findings. The reported scores of EMDR treated patients with SSD on the

SF-36 improved considerably in all domains. Enhanced therapeutic outcomes were also evident for highly reduced scores of somatization subscale of the SCL-90 R, depression and anxiety over 6 week course of the EMDR treatment that can be attributable to the validity of basic hypothesis of the AIP model as to the significant associations between emotions and somatic sensations on the basis of prior painful memories (Shapiro, 2001, 2014). More importantly, in consonant with previous suggestions as to effectiveness of psychotherapy in the literature (Hauser et al., 2009; Henningsen et al., 2007; Wulsin, 2014) the greater effect sizes in EMDR alone treated group relative to duloxetine treatment which were indicative of incomparable improvement in outcome measures showed that EMDR therapy should be considered as one of the first-line treatment alternatives in SSD.

This study has several limitations one should bear in mind while interpreting these findings. First, the sample sizes were relatively small in both EMDR and duloxetine groups. Second, although the study was conducted with a longitudinal research design including pre- and post-treatment measurements of the therapeutic outcomes, a follow-up measurement could have significantly contributed to the assessment of the long-term stability of improvements of EMDR therapy on outcome measures. Third, a combination of EMDR therapy plus duloxetine treatment group could have been helpful to more reliably evaluate the effectiveness of EMDR therapy relative to pharmacotherapy in SSD. In the treatment guidelines of somatic-related disorders and pain, cognitive-behavior therapy (CBT) have been recognized as one of the most widely accepted first-line nonpharmacological intervention indeed (e.g. Wulsin, 2014). Efficacy of EMDR therapy versus CBT should be investigated in further case controlled randomized trials including an additional pharmacotherapy alone or combination treatment group. Finally, the current sample of patients in both treatment groups consisted of women patients with first-time-diagnosis patients with SSD. Effectiveness of EMDR therapy should be warranted in male patients suffering from SSD.

Both treatment groups revealed significant decreases in somatization levels as rated on the respective subscale of the SCL-90 and somatization-related physical and mental health function reported on the SF-36 subscales. Either duloxetine or EMDR treatment resulted in substantial decrease in both anxiety and depression scores as well. However, EMDR treatment exhibited excess of the effect sizes relative to SNRI group.

Declaration of Conflicting Interests

The authors declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding

The authors received no financial support for the research, authorship, and/or publication of this article.

References

American Psychiatric Association. (2013). *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition (DSM-5)*. Washington, DC: American Psychiatric Publishing.

Beck, A. T., Brown, G., Epstein, N., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology, 56*(6), 893-897. doi:Doi 10.1037/0022-006x.56.6.893

Beck, A. T., Rush, J., Shaw, B. F., & Emery, G. (1979). *Cognitive therapy of depression*. New York, NY: Guildford Press.

Bergmann, U. (1998). Speculations on the neurobiology of EMDR. *Traumatology, 4*(1), 2. doi:10.1177/153476569800400102

de Roos, C., Veenstra, A. C., de Jongh, A., den Hollander-Gijsman, M. E., van der Wee, N. J. A., Zitman, F. G., & van Rood, Y. R. (2010). Treatment of chronic phantom limb pain using a trauma-focused psychological approach. *Pain Research & Management, 15*(2), 65-71.

Demiral, Y., Ergor, G., Unal, B., Semin, S., Akvardar, Y., Kivircik, B., & Alptekin, K. (2006). Normative data and discriminative properties of short form 36 (SF-36) in Turkish urban population. *Bmc Public Health, 6*. doi:10.1186/1471-2458-6-247

Derogatis, L. R. (1977). *SCL-90-R administration, scoring and procedures manual* (2nd Edition ed.). Maryland, MD: Johns Hopkins University School of Medicine.

Flor, H. (2002). The modification of cortical reorganization and chronic pain by sensory feedback. *Applied Psychophysiology and Biofeedback, 27*(3), 215-227. doi:10.1023/A:1016204029162

Flor, H., Denke, C., Schaefer, M., & Grusser, S. (2001). Effect of sensory discrimination training on cortical reorganisation and phantom limb pain. *Lancet, 357*(9270), 1763-1764. doi:10.1016/S0140-6736(00)04890-X

Grant, M. (1998). *Pain control with EMDR*. Denver: Mentor Books.

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

Hauser, W., Bernardy, K., Arnold, B., Offenbacher, M., & Schiltenwolf, M. (2009). Efficacy of multicomponent treatment in fibromyalgia syndrome: A meta-analysis of randomized controlled clinical trials. *Arthritis & Rheumatism-Arthritis Care & Research, 61*(2), 216-224. doi:10.1002/art.24276

Henningsen, P., Zipfel, S., & Herzog, W. (2007). Management of functional somatic syndromes. *Lancet, 369*(9565), 946-955. doi:10.1016/S0140-6736(07)60159-7

Hisli, N. (1989). The validity and reliability of the Beck Depression Inventory among university students. *Turkish Journal of Psychology, 7*, 3–13.

Karl, A., Muhlnickel, W., Kurth, R., & Flor, H. (2004). Neuroelectric source imaging of steady-state movement-related cortical potentials in human upper extremity amputees with and without phantom limb pain. *Pain, 110*(1-2), 90-102. doi:10.1016/j.pain.2004.03.013

Kılıç, M. (1991). Belirti Tarama Listesi (SCL 90-R) nin geçerlilik ve güvenirliği. *Türk Psikolojik Danışma ve Rehberlik Dergisi, 1*(2), 45-52.

Kleinstauber, M., Witthoft, M., & Hiller, W. (2011). Efficacy of short-term psychotherapy for multiple medically unexplained physical symptoms: A meta-analysis. *Clinical Psychology Review, 31*(1), 146-160. doi:10.1016/j.cpr.2010.09.001

Kleinstauber, M., Witthoft, M., Steffanowski, A., Van Marwijk, H. W., Hiller, W., & Lambert, M. J. (2015). Pharmacological interventions for somatoform disorders in adults, a Cochrane systematic review. *Journal of Psychosomatic Research, 78*(6), 606-607. doi:10.1016/j.jpsychores.2015.03.070

Luber, M. (2009). *Eye movement desensitization and reprocessing (EMDR) scripted protocols : Basics and special situations*. New York, NY: Springer.

Price, D. D. (2000). Neuroscience: Psychological and neural mechanisms of the affective dimension of pain. *Science, 288*(5472), 1769-1772. doi:DOI 10.1126/science.288.5472.1769

Ray, A. L., & Zbik, A. (2001). Cognitive behavioral therapies and beyond. In C. D. Tollison, J. R. Satterhwaite, & J. W. Tollison (Eds.), *Practical Pain Management* (3rd Ed ed., pp. 189-208). Philadelphia, PA: Lippincott.

Rief, W., & Martin, A. (2014). How to use the new DSM-5 somatic symptom disorder diagnosis in research and practice: A critical evaluation and a proposal for modifications. *Annual Review of Clinical Psychology, 10*, 339-367. doi:10.1146/annurev-clinpsy-032813-153745

Rome, H. P., & Rome, J. D. (2000). 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. doi:DOI 10.1046/j.1526-4637.2000.99105.x

Russell, M. C. (2008). Treating traumatic amputation-related phantom limb pain: A case study utilizing eye movement desensitization and reprocessing within the armed services. *Clinical Case Studies, 7*(2), 136-153. doi:10.1177/1534650107306292

Schneider, J., Hofmann, A., Rost, C., & Shapiro, F. (2007). EMDR and phantom limb pain: Theoretical implications, case study, and treatment guidelines. *Journal of EMDR practice and Research, 1*(1), 31-45. doi:10.1891/1933-3196.1.1.31

Schneider, J., Hofmann, A., Rost, C., & Shapiro, F. (2008). EMDR in the treatment of chronic phantom limb pain. *Pain Medicine, 9*(1), 76-82. doi:10.1111/j.1526-4637.2007.00299.x

Schroder, A., Rehfeld, E., Ornbol, E., Sharpe, M., Licht, R. W., & Fink, P. (2012). Cognitive-behavioural group treatment for a range of functional somatic syndromes: randomised trial. *British Journal of Psychiatry, 200*(6), 499-507. doi:10.1192/bjp.bp.111.098681

Shapiro, F. (2001). *Eye movement desensitization and reprocessing (EMDR): Basic principles, protocols and procedures* (n. Ed. Ed.). New York, NY: Guilford Press.

Shapiro, F. (2007). EMDR, adaptive information processing, and case conceptualization. *Journal of EMDR practice and Research, 1*(2), 68-87.

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), 71-77. doi:10.7812/TPP/13-098

Solomon, R. M., & Shapiro, F. (2008). EMDR and the adaptive information processing modelpotential mechanisms of change. *Journal of EMDR practice and Research, 2*(4), 315-325.

Stahl, S. M. (2013). *Stahl's essential psychopharmacology: Neuroscientific basis and practical applications*. Cambridge, MA: Cambridge University Press.

Tefft, A. J., & Jordan, I. O. (2016). Eye Movement Desensitization Reprocessing as Treatment for Chronic Pain Syndromes: A Literature Review. *Journal of the American Psychiatric Nurses Association, 22*(3), 192-214. doi:10.1177/1078390316642519

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. doi:10.1111/pme.12303

Turk, D. C. (2003). Cognitive-behavioral approach to the treatment of chronic pain patients. *Regional anesthesia and pain medicine, 28*(6), 573-579. doi:10.1016/S1098-7339(03)00392-4

Ulusoy, M., Sahin, N. H., & Erkmen, H. (1998). Turkish version of the Beck Anxiety Inventory: Psychometric properties. *Journal of Cognitive Psychotherapy, 12*(2), 63-172.

van Rood, Y. R., & de Roos, C. (2009). EMDR in the treatment of medically unexplained symptoms: A systematic review. *Journal of EMDR practice and Research, 3*(4), 248-263. doi:10.1891/1933-3196.3.4.248

Voigt, K., Wollburg, E., Weinmann, N., Herzog, A., Meyer, B., Langs, G., & Lowe, B. (2012). Predictive validity and clinical utility of DSM-5 Somatic Symptom Disorder - Comparison with DSM-IV somatoform disorders and additional criteria for consideration. *Journal of Psychosomatic Research, 73*(5), 345-350. doi:10.1016/j.jpsychores.2012.08.020

Ware, J. E., & Sherbourne, C. D. (1992). The MOS 36-item Short-form Health Survey (Sf-36) .1. Conceptual framework and item selection. *Medical Care, 30*(6), 473-483. doi:10.1097/00005650-199206000-00002

Wilensky, M. (2006). Eye movement desensitization and reprocessing (EMDR) as a treatment for phantom limb pain. *Journal of Brief Therapy, 5*(1), 31-44.

Wulsin, L. (2014). Intensive interventions for somatic symptom disorders. In G. O. Gabbard (Ed.), *Gabbard's treatments of psychiatric disorders* (5th Edition ed., pp. 591-602). Washington, DC: American Psychiatric Publishing.