

IPA

International Journal of Psychology
Vol. 14, No.1, Winter & Spring 2020
PP. 192-226

Iranian Psychological
Association

The Effectiveness of Eye Movement Desensitization and Reprocessing (EMDR) on Fear of Negative Evaluation (FNE) and Social Adjustment in Female Students with Social Phobia

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Received: 31/ 1/ 2019 Revised: 22/ 3/ 2020 Accepted: 26/3/ 2020
Doi: 10.24200/ijpb.2020.170331.1086

The present study aimed at determining the effect of eye movement desensitization and reprocessing (EMDR) on fear of negative evaluation (FNE) and social adjustment in female students with social phobia. The population of the study consisted of all female students of Mashhad Higher Education Institute of Engineers (Northeastern Iran). Thirty students were selected randomly from among those whose had high scores in the social phobia questionnaire. They responded to the FNE and social adjustment scales. The research was quasi-experimental following a pretest-post-test control group design. The experimental group received an intervention protocol, while the control group received no intervention. The data were analyzed using Univariate/Multivariate covariance analysis (ANCOVA & MANCOVA) through SPSS v.21. The findings indicated that the EMDR leads to reduced FNE ($F = 35.20, p < .0001, \eta^2 = .773$) and increased social adjustment ($F = 41.07, p < .0001, \eta^2 = .699$). Having participated in the EMDR

therapy, students with social phobia reported reduced symptoms of social phobia, such as FNE and greater social adjustment. The EMDR is an effective therapeutic approach to reducing anxiety disorders, including social phobia and enhancing social adjustment.

Keyword: eye movement desensitization and reprocessing, fear of negative evaluation, social adjustment, social phobia

Many people have social concerns when exposed to the community. Indeed, many individuals fear and become anxious under certain social conditions (Atasoy, Karabulut & Yalçinkaya, 2016). Anxiety is a significant psychological phenomenon which affects individuals' lives, and everybody experiences some levels of anxiety in their everyday life (Ganesh Kumar, Athilakshmi, Maharishi & Maya, 2015). Social phobia is one of the most common forms of anxiety disorders which is considered a malicious condition. The disorder is characterized by persistent fears in performance or social situations where individuals are likely to be subject to embarrassment or scrutiny by others (Wong, Sarver & Beidel, 2012).

Social anxiety disorder (SAD), also called social phobia, refers to severe fear or anxiety of situations where the individual is likely to be evaluated by others (American Psychiatric Association, 2013). In other words, social phobia involves situations where severe levels of social anxiety are observed (Necypor, 2015). The disorder is common among children and adolescents and its prevalence in adults reaches 3-13% (Mohammadi & Beige, 2017). SAD or social phobia is highly prevalent and FNE plays an important role in its development. The consequence of this social anxiety or phobia includes disruption of social relationships and damage to individual social adjustment. Thus, finding a treatment to this disorder is of

high priority. Social phobia disorder or social anxiety is a type of anxiety disorder whose main symptom is fear of negative evaluation in one or more social situations. This fear leads to anxiety and distress in those situations. The significant tribulation of those situations makes the individual avoid them (Ranta, 2008). Researchers believe that social anxiety is characterized by FNE. For example, several studies have revealed that individuals with high social anxiety experience extreme anxiety and fear during or before public speaking (Takagishi, Fujii, Nishina & Okada, 2016).

FNE is one of the main cognitive factors in SAD or social phobia. Individuals with this disorder fear of being negatively evaluated by people (Dadashzadeh, Yazdandoost & Gharraee, 2012). Indeed, an individual with FNE is anxious about others' evaluations; she worries and expects others to evaluate her in a negative way. FNE refers to individuals' social concerns in contexts joint with evaluation (Doğan, 2018). FNE is measured as an outstanding feature of SAD. Individuals with social phobia are sturdily afraid of and avoid social interactions and situations (Van der Molen et al, 2014). They might also have difficulty in educational, social, and occupational contexts (Wong et al, 2012).

Naturally, an individual who suffers from phobia or anxiety in social situations cannot demonstrate her potency and faces difficulty coping with social situations and behaviors or tasks associated with diverse roles and circumstances, where the individual's adjustment with those situations is disturbed. Social adjustment is a reflection of the individuals' interaction with others, satisfaction of her roles and the quality of functioning in different social roles (Ranjbar kashkoe, 2013). Many studies know social adjustment as a criterion for mental health

(Rahmati, Adibrad & Tahmasian, 2010). As an essential area in student wellbeing, social adjustment is a strong predictor of life satisfaction and depression. If students perceive themselves as well appearing in the community, they engage in satisfying relationships with others (Smojver-Ažić, Živčić-Bećirević & Jakovčić, 2010). Social adjustment plays an indispensable role in the sustainability and stability of students in student life; therefore, students are expected to create a set of adaptations-one being social adjustment- to cope with new lifestyles, (Gray, Vitak, Easton, Ellison, 2013).

Different therapies have been used to treat anxiety disorders, including pharmacotherapy, behavioral therapy (exposure), and cognitive behavioral therapy (CBT). Since anxiety disorders are multifaceted in nature, accordingly multiphasic therapies covering different dimensions of the issue are needed. EMDR is one of these integrated therapies, which consists of eight steps (Table 1). It identifies and reprocesses past memories underlying current problems (Solomon & Rando, 2012). EMDR is a psychological method used to treat post-traumatic stress disorder, but has since been used as a general approach to traumatic life-long experiences. Once the therapy finishes, emotional distress decreases, negative beliefs are reformulated, and physiological arousal diminishes (Höfel et al, 2018).

EMDR is a comprehensive therapeutic approach that is consistent with all contemporary theoretical orientations (Shapiro & Lalotis, 2011). This therapeutic approach consists of standard procedures and protocols, retrieving unprocessed memories and, at the same time, uses eye bilateral movement (Shapiro, 2014). It is a complex psychotherapy approach incorporating physical, emotional, cognitive, and behavioral components. The treatment stages include history taking,

preparation, assessment, desensitization, installation, body scanning, closure and reassessment (Moreno-Alcázar et al, 2017). This treatment is effective in resolving negative memories that play a key role in a wide range of psychological syndromes or problems (De Jongh, Ernst, Marques, Hornsveld, 2013). It has also proved effective for many disorders, including epilepsy-related post-traumatic stress and anxiety (Dautovic, De Roos, Van Rood, Dommerholt & Rodenburg, 2016), traumatic loss (Lenferink et al, 2017), depression (Wood & Ricketts, 2013), psychological worry in generalized anxiety (Farima, Dowlatabadi & Behzadi, 2015), grief and bereavement (Solomon & Rando, 2012), bipolar disorders, unipolar depression, anxiety disorders (Valiente-Gómez et al, 2017), glossophobia (Aslani, Miratashi & Aslani, 2014) and social, emotional and health adjustment of male prisoners (Narimani et al, 2014).

A review of research conducted in Iran, in particular, shows that no research has simultaneously used this treatment to reduce the underlying causes of social phobia, including FNE and increased social adjustment for female students. Research has shown that social phobia (Doğan, 2018; American Psychiatric Association, 2013) and FNE (Doğan, 2018; Atasoy et al, 2016) are higher in women and girls, and good social adjustment has increased the satisfaction of life in female students (Smojver-Ažić et al., 2010). For this purpose, the present study seeks to answer the question of whether EMDR is effective in reducing FNE and increasing social adjustment of female students.

Method

The statistical population of the study consisted of all female students with social phobia in Mashhad Higher Education

Institute of Engineers. Four hundred female students were enrolled at this higher education institute. The social phobia scale (Connor et al, 2000) was distributed among all of the 400 students. Out of these 400 students, only 140 students voluntarily completed the scale and returned it to the researcher. Of these 140 students, 90 reported high scores in the social phobia scale. Out of these 90 students, 30 were selected randomly as the final participants of the study. The inclusion criteria were as follows:

- a score of 19 and above on the social phobia scale,
- willingness to participate in the research,
- not participating in other therapeutic programs simultaneously,
- not receiving individual counseling or medication, and
- Informed consent.

The current study was a quasi-experimental research method aimed at determining the effectiveness of the EMDR in Female students with social phobia. The study comprised of two groups (one experimental and one control) with the pretest–posttest group design. The random selection method was used and both groups took the pretest and posttest; also, the experimental group received the treatment protocol while the participants of the control group did not receive any treatment. The present study followed a semi-experimental research type with a pretest-posttest control group design. Thirty participants, whose scores on the social phobia scale were high, were randomly assigned into two experimental and control groups of 15. All members of the sample responded to two instruments including Leary's Fear of Negative Evaluation Scale and Bell's Social Adjustment Sub-Scale in the pre-test phase. The experimental group received

EDMR therapy from February to July 2017, while the control group was not exposed to any interventions. For each client, 10 one-hour individual sessions were held. The intervention program was developed based on Kinowski's training protocol (Kinowski, 2003) and other available resources (Shapiro & Maxfield, 2002; Shapiro, 2014; Solomon & Rando, 2012). The goal of the treatment was to improve fear of negative evaluation and social adjustment. This protocol was implemented by the second author who was trained in the field of EMDR. At the post-test stage, the participants responded to the scales again. First, a multivariate analysis of covariance (MANCOVA) was conducted to investigate the EMDR effectiveness designed to reduce participants' FNE, social phobia and to improve social adjustment. If the MANCOVA results were significant for at least one of the dependent variables, then univariate analysis of covariance (ANCOVA) was used to track the results. The data were analyzed using SPSS V. 21. In this research, ethical considerations, including maintaining confidentiality and informed consent, were respected.

Instruments

Social Phobia Inventory

Connor et al. Social Phobia Inventory (SPIN) consists of 17 items graded based on a five-point Likert scale. The inventory has three scales: fear (6 items), avoidance (7 items) and physiological discomfort (4 items). The test, with its stable psychometric features, can be used to measure the severity of symptoms of SAD. As it is susceptible to decreasing symptoms over time, it can act as a screening tool. It is also used to test response to treatment or distinguish treatments with different effectiveness. The developers of this scale calculated the

reliability of the test using the retest method in groups with SAD diagnosis from .78 to .89. They also reported the overall internal consistency of the scale items as .94 and for the three components of fear, avoidance, and physiological discomfort, as .89, .91, and .80, respectively, which were highly desirable (Connor et al, 2000). The convergent validity for the whole scale in patients with SAD compared with the Brief Social Phobia Scale scores, reported a high significant correlation coefficient of .57-.80. The inventory separates individuals with SAD and those without disorder with a cut-off point of 19 and a diagnostic accuracy and efficiency of .79 (Davidson et al, 1997).

Leary's brief Fear of Negative Evaluation Scale

Leary's brief Fear of Negative Evaluation Scale has 12 items which measures the level of anxiety experienced by individuals or their negative evaluation, which is graded in a 5-point Likert scale. The higher scores on this scale are associated with higher degrees of FNE (Weeks et al, 2005). A survey of a group of students showed that the instrument has a high correlation ($r = .96$) with the main form. The internal consistency of the test is high ($\alpha = .9$). The reliability of test showed a coefficient of .75 in a four-week interval. This scale revealed correlation coefficient of .56 with Lybowitz's social anxiety scale (Dadashzadeh et al., 2012).

Bell's Social Adjustment Subscale

Bell's social adjustment subscale was used to assess social adjustment. The adult form of the scale consists of 160 items, which measure five dimensions of family adjustment, health adjustment, social adjustment, emotional adjustment, and job adjustment (Bell, 1962). The reliability coefficient of this scale

has been reported in different dimensions of adjustment (.62, .82, .67, .74, .57, and .051, respectively) using Spearman-Brown's formula. The Cronbach's alpha coefficient of this questionnaire has been reported .89 (Narimani et al, 2014). In the present research study, the social adjustment subscale consisting of 32 items was used. Lower scores in this instrument are associated with better social adjustment. The reliability of the dimension of social adjustment of the questionnaire was .79 using Cronbach's alpha coefficient, indicating the acceptability of the social dimension of this questionnaire. Also, the correlation coefficient of social adjustment subscale with its total score of this questionnaire was .88 (Bell, 1962).

Table 1
Overview of Eight-Phase Eye Movement Desensitization and Reprocessing (EMDR) Therapy Treatment

Phase	Procedures
History taking	<p>At this point, we use questions and techniques to identify past events that underlie pathology, current stimulus, and future needs.</p> <p>In the history stage, the goal is to identify experiences that underlie current problems. It is essential to identify the first social anxiety or stimulus status at this stage.</p> <p>At this point, moments of past distress are identified. Often, the moment of realizing social anxiety is a good initial goal.</p> <p>Client evaluation of EMDR suitability is crucial. EMDR can be used when the client is able to understand the emotional impact of the problems, has sufficient emotional tolerance to deal with the emotions that may arise, and has sufficient internal and external</p>

stability.

Preparation

The EMDR preparation phase involves building a therapeutic alliance, providing training on symptom set (including fear of negative evaluation and social anxiety processes), discussing EMDR treatment and its effects, and using metaphors and techniques that enhance stability and sense of personal control in the clients. In this regard, one needs to consider the client's needs. In the reprocessing phase, new connections are created between the disrupted memory network and the memory networks containing more adaptive information. The clinician should determine if the essential memory networks contain appropriate and adaptive information. If this is not the case, memory networks should be supplemented with appropriate experience and information. For example, a client with a history of anxiety problems (**FNE and social adjustment**) may need to experience a relationship with an accepting, cordial therapist to serve as a substitute for previous negative experiences. After encoding these positive experiences, they become part of the client's memory network. At present, the memory network contains relationships that can now be used to link and reconfigure memory networks containing negative relationship experiences. In order for information to be processed, the customer needs to have access to the dysfunctionally-stored information and maintain a dual awareness. It means that it is present in the present time and at the same time experiences the previous memory. If the client lacks the ability to retain dual

knowledge, we need to include the following in preparation: training our control techniques such as relaxation skills, strengthening stability, self-mastery, skill, resourcefulness and control. In the first session, EMDR therapy is discussed and the client is given several emotion and affect management strategies. This includes a safe place, deep breathing, and other basic procedures.

Assessment

Drawing up (eliciting) the image, negative beliefs that are currently important, favorable positive beliefs, current and physical feelings (sensations), and baseline formulation are important goals of this phase. The measurement phase introduces the EMDR re-processing steps, in which the specific elements of targeted memory come to mind. After acquiring the disturbing experience as the primary target for reprocessing, the client identifies the worst image, negative beliefs, and feelings associated with recalling that experience (**social anxiety**) and the location of the associated physical sensations. When the annoying experience comes to mind, negative beliefs such as "I'm not good enough", "I'm vulnerable", "I'm powerless" may come to mind. Next, positive and desirable cognitions should be identified and replaced by negative beliefs. Two tools are used to measure clients' cognitions and emotions and feeling: Validity of Cognition (VoC) scale and a Subjective Units of Disturbance ([SUD] scale).

Desensitization

The sensitization step is the first of three active reprocessing steps. Here, the client focuses on the image, negative beliefs, and

physical feelings associated with disturbing memory (**social anxiety**), while simultaneously being subjected to sets of two-way (bilateral) stimulation. The purpose of this step is to address the dysfunctional aspects of memories and to integrate them fully into adaptive memory networks. Spontaneous changes in cognition, emotion, and physical sensation reflect the therapeutic effects of the session. Positive patterns for future adaptive behaviors are also considered.

Installation

The purpose of this step is to enhance the validity of the desired positive belief and fully integrate the positive effects into the memory network. The installation phase inhibits this natural move towards resilience and adaptive clarity by pairing positive cognition with traumatic memory and continuing processing with additional two-way stimulation. Processing continues by reinforcing the association between dysfunctionally-stored information and existing positive cognitive schemas as well as facilitating generalization effects in memory networks. The VoC scale is used to measure the therapeutic effects.

Body Scan

The EMDR focuses heavily on nonverbal information such as images, smells, tastes, and sounds, and bodily sensations caused by stress or discomfort resulted from **social anxiety**. When processing seems to be complete for a particular target, clients are asked to close their eyes, have a positive awareness (cognition) in mind and focus on different parts of their body, and start this from their head and go down and continue. They should also notice any stress, stiffness

	or unusual sensation in their body. If such a sensation is experienced, it is processed with bilateral stimulation.
Closure	Use guided or self-control imaging techniques if needed. Expectations and behavioral reports should be included between sessions. At the end of the session, preparing ways for the client to return to balance can be important (for example, practicing in a safe place or other stabilization strategies can be important). In addition, the client is reminded that processing may continue between sessions. It is also suggested to write down any discomfort that may arise between sessions as this is useful and can be addressed at later sessions. The client is also reminded that she/he can continue to use the self-care techniques she learned during the EMDR preparation phase. No specific "homework" is assigned to the clients.
Reassessment	Evaluation of therapeutic effects and evaluation of integration into the larger social system are the goals of this phase. The following session will examine the client: their current psychological states, whether the therapeutic effects of the previous session were maintained, and other substances (such as dreams, flashbacks, other memories) that may have emerged from the last session. The result of this evaluation will guide further treatment.

Results

Table 2 presents the mean and standard deviation of the pretest and posttest scores of the dependent variables for the two experimental and control groups. In Table 2, the results of the

Shapiro-Wilk test to examine the normal distribution of variables in the groups have been reported as well. According to Table 2, the z statistic of the Shapiro-Wilk test is non-significant for all variables. Thus, it can be concluded that the distribution of these variables is normal. The results of Pearson correlation analysis from participants' pre-test scores showed that the relationship between social phobia and fear of negative evaluation as well as social adjustment was respectively +.56 and -.43, and the robustness of these relationships interpreted as moderate.

Table 2
Descriptive Statistics of the Pre-Test and Post-Test Scores
for the Experiment and Control Groups (N = 30)

Variable	Time	Groups	M±SD	Shapiro -Wilk	P- value
Fear of Negative Evaluation	Pre-test	experimental	44.27±5.06	.51	.95
		Control	42.61±5.19	.52	.94
	Post-test	experimental	35.25±4.41	.73	.64
		Control	44.33±5.04	.89	.40
Social Adjustment	Pre-test	experimental	88.75±10.48	.56	.91
		Control	86.92±9.71	.88	.42
	Post-test	experimental	53.15±5.86	.35	1
		Control	87.83±8.74	.48	.93
Social Phobia	Pre-test	experimental	36.27±13.55	.53	.89
		Control	37.07±13.32	.81	.40
	Post-test	Experimental	24.87±16.37	.42	.96
		Control	35.67±13.76	.41	.96

For analyzing the effect of intervention on all variables MANCOVA was used. Before that, by the Shapiro-Wilk test for normality of the distribution of scores, and the Leven ($P > .05$) and Box M test ($F = 1.30$, $P = .325$) for equality of variances and homogeneity of regression, assumptions of parametric covariance tests were confirmed. The results of MANCOVA showed that all of values were less than the significant level (For example the value of Wilks' Lambda = .072, $F = 72.127$, $P < .0001$, Observed Power = 1.000). Thus, there was a significant difference between the two groups at least in one dependent variable (Table 3).

Table 3
Multivariate Analysis of Covariance (MANCOVA) Tests

Test Name	Value	F	Hypothesis df	Error df	P-Value
Pillai's trace	.923	92.126	3.00	23.00	.0001
Wilks' Lambda	.072	72.127	3.00	23.00	.0001
Hotelling's trace	12.016	92.126	3.00	23.00	.0001
Roy's largest root	12.016	92.126	3.00	23.00	.0001

For analyzing data from effect of EMDR on FNE and social adjustment, two distinct ANCOVAs were run. The results of the test for the homogeneity of regression slopes of FNE pretest and posttest for the experimental and control groups showed that the regression slope was equal in both groups ($F_{1,28} = .62$, $p = .44$). The results of the test for the homogeneity of regression slopes

for social adjustment also showed that the slope in both groups is equal ($F_{1,28} = .09, p = .87$). The results of the Levene's test for homogeneity of error variances in dependent variables revealed that the variance of FNE ($F_{1,18} = 2.30, p = .14$) and social adjustment ($F_{1,18} = 2.91, p = .09$) were equal in the groups. Table 4 reports the results of ANCOVA to examine the difference between the experimental and control group's FNE and social adjustment pre-test and post-test scores.

Table 4
Results of Three Separate ANCOVA to Determine the Difference between the Experimental and Control Groups on the Dependent Variables (FNE and Social Adjustment and Social Phobia)

Dependent variable	Source	SS	df	MS	F	P-value	η^2
Fear of Negative Evaluation	Group membership	424.34	1	424.34	283.08	.0001	.913
	Error	40.47	27	1.50			
Social Adjustment	Group membership	138.49	1	138.49	47.42	.0001	.637
	Error	78.85	27	2.92			
Social Phobia	Group membership	742.31	1	742.31	27.08	.0001	.501
	Error	739.99	27	27.41			

According to Table 4, the F statistic of FNE in the post-test phase is 238.08, which is statistically significant at 99% confidence level, suggesting a significant difference between the two groups in the level of FNE ($p < .0001$). To further examine this difference, the FNE scores of the groups in the pretest and posttest stages are shown in Figure 1. The effect size of .91 for this dependent variable reveals that this difference is large. In

addition, the F statistic of social adjustment in the posttest stage was 47.42, which is statistically significant at 99% confidence level, indicating a significant difference between the two groups in terms of social adjustment ($p < .0001$). The social adjustment scores of the groups in the pretest and posttest stages are shown in Figure 2. The effect size of .64 for this dependent variable shows that this difference is large. Eventually the F statistic of social phobia in the posttest stage was 27.08, which is statistically significant at 99% confidence level, indicating a significant difference between the two groups in terms of social phobia ($p < .0001$). The social phobia scores of the groups in the pretest and posttest stages are shown in Figure 3. The effect size of .50 for this dependent variable suggests that this difference is large. Note that lower scores in this test mean better adjustment. Overall, according to these findings, the EMDR intervention can reduce FNE and improve social adjustment.

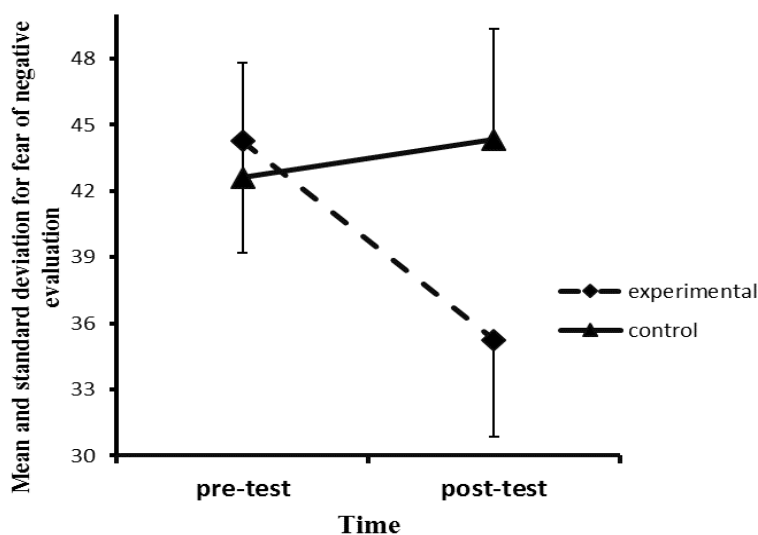


Figure 1. Comparison of FNE pretest and post-test mean scores for the experimental and control groups

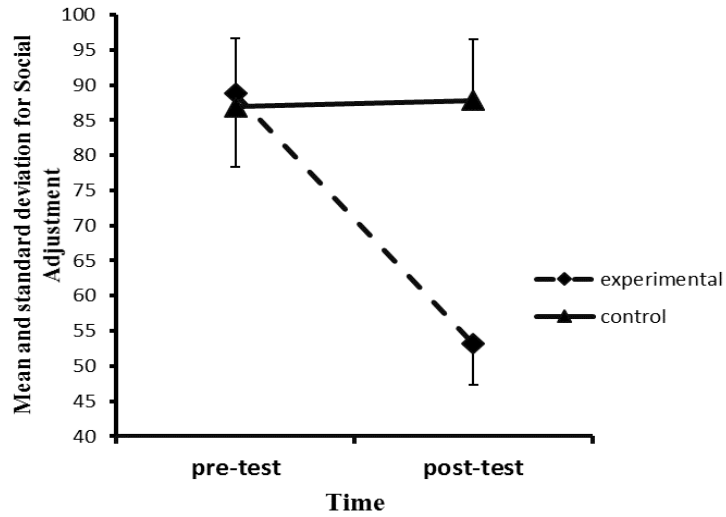


Figure 2. Comparison of social adjustment pretest and posttest mean scores for the experimental and control groups

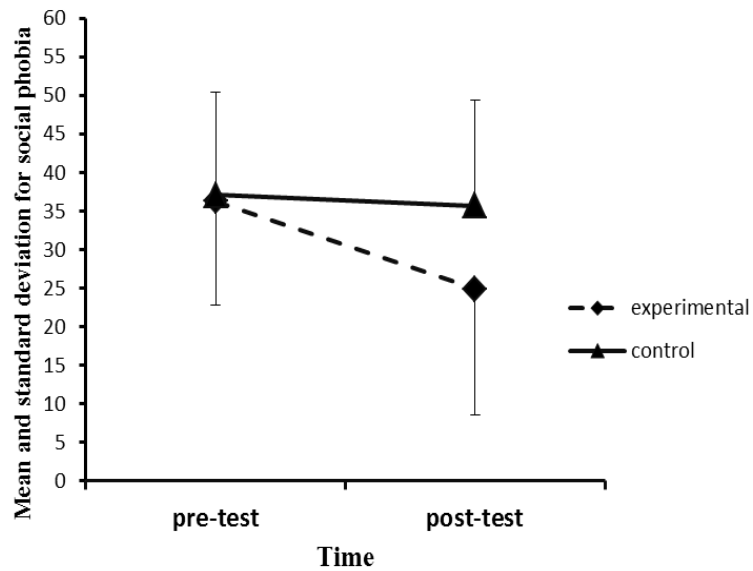


Figure 3. Comparison of social phobia pretest and posttest mean scores for the experimental and control groups

Discussion

The purpose of this study was to investigate the effectiveness of the EMDR therapy on the FNE and social anxiety of female students. Data analysis revealed that both hypotheses of this research were confirmed. Regarding the first research hypothesis, it could be argued that this therapeutic approach has reduced FNE. Given that FNE underlies social phobia, social fears can be expected to decline. The findings of this study are consistent with various studies on the effectiveness of EMDR in reducing several types of anxiety disorders.

Farima et al (2015) Found that EMDR is effective in reducing psychological worries of generalized anxiety by increasing tolerance to uncertainty. Ashayeri et al (2011) also showed that both the EMDR and CBT methods reduce the level of anxiety symptoms equally and the results of these two interventions were better than those of pharmacotherapy. Davidson & Parker (2001) reported that EMDR is more effective in the treatment of anxiety and trauma as compared with the absence of therapy or non-exposure therapies. In this regard Dautovic et al. (2016) showed that this method is effective in the treatment of epilepsy-related post-traumatic stress and anxiety in children. Horst et al (2017) found that EMDR, as with CBT, was effective in the treatment of panic disorder. Moreno-Alcázar et al (2017) pointed out that EMDR is superior to waitlist/placebo conditions and is effective in reducing anxiety syndrome and PTSD as compared with CBT. Research by Chen et al. (2014) also revealed that this therapy significantly reduces PTSD syndrome, depression, anxiety and subjective distress in patients with PTSD. In Iran, Khanjani, Hashemi & Vatani (2016) reported that EMDR is effective in the treatment of certain phobia disorders. Likewise, Shanhnnavazi

et al. (2016) showed that the anxiety of adolescents with thalassemia decreased after EMDR intervention.

In sum, it has been proved that this model is more effective in treating injuries than other therapies are, and its effectiveness is appropriate in other cultures (Wilson et al, 2018). Individuals with social phobia avoid attending public and social situations or interactions. They are worried because of the fear of negative evaluation by others. The fear of negative evaluation is the cognitive core of social anxiety and phobia, and research has shown that these two variables are correlated (Weeks, Heimberg & Rodebaugh, 2008; Ganesh Kumar et al, 2015). Therefore, if fear of negative evaluation is reduced, social phobia also diminishes.

There are various explanations regarding the effect of EMDR. However, given that FNE deals with biased information processing, it seems that explanations related to the processing of information are more appropriate, because the EMDR model assumes that psychological trauma occurs when disturbing experiences are not adequately processed, and thus hypothesizes that EMDR speeds up information processing (Shapiro & Maxfield 2002). Van der Molen et al's research (2014) showed that individuals expect evaluative feedback, and when they are faced with social evaluation, their information processing is biased. In this context, Button et al (2015) found that individuals with several FNE's, process information of social evaluation in a different way. Therefore, socially anxious individuals have maladaptive evaluation of social situations and retrieve negative information about them selectively. These individuals use this biasedly processed information for negative self-evaluation. In many cognitive models, it is suggested that individuals with social anxiety have a range of biases in the processing of

information which results in anxiety. As a result, this anxiety and negative evaluation help to persist and maintain anxiety (Van der Molen et al., 2014). EMDR is driven through the Adaptive Information Processing (AIP) model (Shapiro, 2014). The AIP model conceptualizes the effects of traumatic experiences in the form of traumatic memories networks within a physiological information processing system (Solomon & Rando, 2012). The goal of EMDR is to achieve sufficient processing of negative experiences and creation of new adaptive information (Moreno-Alcázar et al, 2017).

The AIP model assumes that when experiences are processed in a healthy manner, various elements associated with those experiences, including thoughts, imaginations, emotions, and body sensations are stored in memory. When the traumatic or disturbing event occurs, this information processing is not completed. As a result, access to healthy and adaptive information stored in the memory network is obstructed. In this case, individuals will stick in experiencing a visual flashback or emotion and cannot adapt to that experience. Thus, that experience is not processed and the physiological system is not able to return to a healthy state and as a result, the individual's emotions will maintain in a state of imbalance (Höfel et al, 2018; Wood & Ricketts, 2013). In simple terms, we can say that, the reason that the trauma continues after the traumatic event is that every day stimulus invokes the negative emotions and thoughts associated with these traumatic memories and cause the client to act in compliance with the trauma. Inappropriate information processing means that the clients emotionally and behaviorally respond in line with harm. Many of the things that are considered mental disorders are the result of improper storage of information in the brain. Thus, improvement occurs

when this information is released and processed (Sabori Moghaddam, Fakhshipoor-Roodsari & Ghahraman-Moharrampoor, 2014). EMDR facilitates the processing of traumatic memories through their intense recognition and using bilateral eye stimulation. As a result, emotional distress disappears, negative beliefs are reformulated, and physiological arousal decreases (Höfel et al, 2018; Wood & Ricketts, 2013).

Upon completion of the 8-step process of treatment in EMDR and after proper information processing at stages 4 and 5, a cognitive setting is created in the individual. Indeed, cognitive reconstruction occurs and maladjusted cognitions are replaced with healthy adaptive cognitions. Cognitive reconstruction is one of the mechanisms of this therapy (Solomon & Shapiro, 2008). Cognitive reconstruction does not seem to be the end of treatment, since, based on the AIP model, the stored disturbing data must be physiologically experienced. Thus, EMDR is not complete unless the clients can bring the disturbing memories into mind without any significant body tension (Shapiro & Maxfield, 2002). In this way, the emotions of unpleasant experiences are minimized and the pressure exerted on them is eliminated such that the clients do not avoid being exposed to an unpleasant stimulus. Accordingly, this cognitive reconstruction seems to result in emotional regulation in the individual as well, as EMDR is a complex psychotherapy approach with physical, emotional, cognitive, and behavioral components, where each of these components plays a key role (Moreno-Alcázar et al, 2017).

EMDR can increase self-awareness, alter beliefs and behaviors, and reduce anxiety and depression and eventually lead to positive emotions (Chen et al., 2014). Shapiro (2014) also believed that the processing of memories of negative

experiences leads to the rapid elimination of negative emotions, beliefs, and body feelings. It seems that these interventions, along with information processing and cognitive reconstruction, stimulate the emotional intelligence where the regulation of emotional intelligence makes it possible to reduce the symptoms of social phobia. In this regard, Khademi (2013), Rasooli et al. (2013) and Karami et al. (2015) also reported a relationship between emotional intelligence and emotional regulation with social phobia, where emotional imbalance and instability can lead to fixation of social phobia. Thus, if individuals' emotions can be regulated, their social phobia in social situations can be reduced too. Farima et al (2015) showed that EMDR reduced the pathological worries in patients with generalized anxiety disorder. In their explanation, they also considered emotional intelligence as an important mechanism.

The reason could be attributed to the eye movement component, as eye movement reduces negative cognitions, relaxes negative emotions and unpleasant physical feelings associated with traumatic memory, and enhances positive cognitions (Moreno-Alcázar et al., 2017). Eye movements can contribute to reduction of emotions (De Jongh et al., 2013). Lee & Cuijpers (2015) found that when eye movements are added to treatment, the transparency of traumatic memories decreases dramatically and their emotional load drops. Leer et al. (2017) also concluded that eye movements during recollection of memories diminish the clarity of their mental memories and emotional load. Bilateral eye movement in EMDR can create favorable neurophysiological conditions and a sense of relaxation and security, resulting in integrated memory, reduced perception of traumatic memories and diminished transparency

of memories (Pagani, Amann, Landin-Romero & Carletto, 2017).

Researchers believe that EMDR activates brain hemispheres through left- and right-side eye movements, and depletes the emotional experiences that are stuck in the nervous system (Sabori-Moghaddam et al., 2014). When an individual is exposed to a traumatic stimulus, a process begins in her central nervous system, which leads to norepinephrine secretion. However, in the EMDR therapy, individuals also make eye movements while thinking of the traumatic memory. As with REM, these eye movements seem to prevent norepinephrine secretion. As a result, it prevents the powerful limbic reaction and allows the cortex to handle cognitive processing of information more strongly, because when a subject faces a fearful stimulus, the amygdala route is activated and responds in the form of sense of danger and avoidance. In EMDR, eye movements prevent the persistence of amygdala response, causing the cortex to process the fearful stimulus faster than the amygdala route, resulting in an adaptive response (Khanjani et al., 2016). Researchers believe that psychotherapy for traumatic syndrome should include areas of the brain that are related to the representation of emotions and memories. Areas such as the amygdala that link memory and emotions should also be considered in treatment. This matter happens in EMDR treatment (Amano & Toichi, 2016).

In sum, it can be stated that EMDR leads to a cognitive reconstruction in an individual. Healthy cognitions can reduce FNE. In addition, eye movements help stabilize the individual's emotional state, and by manipulating the emotional intelligence, it leads to decreased social phobia, as there is a relationship between emotional intelligence and social phobia.

Regarding the second hypothesis, the findings of the research showed that this treatment improved the social adjustment of girls with social phobia. In Iran, only one single study (Narimani et al, 2014) has been conducted on the effect of EMDR on social, emotional, and health adjustment of male prisoners. Its results have shown that this approach has increased the social adjustment of male prisoners. Regarding the present research, it can be argued that FNE is related to social phobia (Shafiei, Zare, Alipoor & Hatami, 2014) and is an underlying factor for social phobia (Atasoy et al., 2016). Consequently, when FNE is reduced (the first hypothesis confirmed that EMDR has reduced FNE), social phobia could also be expected to decrease. Thus, the individual appears to improve in social communication, and with better assertiveness, she can play a variety of educational, occupational, family, and communication roles; as we know people with social phobia have a lower degree of social assertiveness (American Psychiatric Association, 2013).

When social phobia and anxiety are reduced, the individual appears more courageous in the public and assumes different roles. In this regard, Amidnia et al. (2010) found a relationship between self-expression (assertiveness) and the degree of individual and social adjustment in female students. Naderi et al (2007) also found that social skills training is effective in individual-social adjustment, aggression, and assertiveness of high-risk girls. Attari, Shaheni, Koochaki & Beshlideh (2005) also reported that social and communication skills training is effective in the adjustment of delinquent adolescents. Thus, the more one can develop his/her social and communication network without worries and discomfort, the greater his social adjustment will be (Barzegar-Befrooei, 2015). In their research, Rahmati et al. (2010) showed that life skills training are

effective on social adjustment in children and one of the factors affecting social adjustment is learning social skills. It is because if a person's social status in a group improves, so does his or her compatibility (adjustment). Smojver-Ažić et al. (2010) also stated that students who perceived themselves as being well-assimilated (accepted) in the community, participated in more satisfying relationships with others, and ultimately showed better social adjustment.

Thus, it can be concluded that EMDR interventions helped female students reduce their fear of negative evaluation, as well as their social phobia so as to be present in social and communication environments and to play different educational and communication roles with more relaxation and courage (assertiveness). Accordingly, due to this successful presence in social situations, their social adjustment would also improve. The present research aimed only at female students. Since students are more likely to understand the treatment plan and perform treatment guidelines better than ordinary people, generalization of the results to the public should be done with caution. There was no sham group in this study and thus the current results may be due to Hawthorne effect. The sample size in this study was small and so this is one of the limitations of the present study that should be carefully considered. It is suggested that similar research studies be conducted on other samples, including less educated people, male population and the effectiveness of this model be compared between male and female students. Long-term follow-ups can also measure and validate the therapeutic model over time.

Acknowledgments

We thank all the female students and the officials of Mashhad Higher Education Institute of Engineers who, with their cooperation, provided the conditions for conducting this research.

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