

## Comparing the effectiveness of cognitive behavioral therapy, biofeedback and EMDR on anxiety sensitivity in women with migraine

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### Article Info

### ABSTRACT

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This study aimed to compare the effectiveness of cognitive behavioral therapy, biofeedback and EMDR on anxiety sensitivity in women with migraine. The current research was of an applied type and a quasi-experimental design of pre-test, post-test and follow-up with a control group, in which three separate experimental groups and one control group were used. The statistical population of the present study includes all women who visited Tehran's Cheshm Andaz Ayandeh clinic in 2022 due to migraine. Sixty people were randomly selected and then equally assigned to groups (15 people in each group). Cognitive behavioral therapy was performed based on the Otis et al.'s (2021) protocol in 12 90-minute sessions; EMDR was performed according to the protocol of Maxfield (2019) in 3 sessions of 90 minutes, and biofeedback was performed according to the protocol of Mullally et al.'s (2009) in 15 sessions of 60 minutes. Also, the present study had a one-month follow-up phase. By controlling the effect of pre-test scores for research variables, the difference of all 4 groups in both post-test and follow-up stages for anxiety sensitivity is statistically significant. The effect of group membership for the anxiety sensitivity variable was 0.61 in the post-test phase and 0.52 in the follow-up phase. It shows that group membership explains 0.61 of the changes in grades in the post-test stage and 0.52 in grades in the follow-up stage. In other words, the treatment methods improved 0.52 of anxiety sensitivity in the follow-up. The results of the pairwise comparison showed in the analysis that all three treatments had a significant effect on reducing anxiety sensitivity. However, these three treatments were similar in terms of their effect on anxiety sensitivity.

**Keywords:** Cognitive behavioral therapy, biofeedback, EMDR, anxiety sensitivity.

### 1 Introduction

Migraine is a recurring disease, the prevalence of which is 20% in women and 8% in men, so

guidelines for treating attacks or preventing them with drug treatment or behavioral therapy are of great importance (Kearson et al., 2019). Migraine patients often show resistance to medical treatments, which is partly due to drug

side effects. Therefore, patients may need other strategies to manage pain and symptoms (Malek et al., 2017). Findings show that anxiety sensitivity is a trigger and aggravating factor in migraine (Hellberg, Russell, & Robinson, 2019; Hindiyeh, Krusz, & Cowan, 2013; Wu, Yang, & Chen, 2017). Anxiety sensitivity is the fear of bodily sensations caused by arousal that arises from a person's belief about the meaning of their feelings. People who have a high level of anxiety sensitivity believe that physical sensations caused by arousal are dangerous, and people who have a low level of anxiety sensitivity believe that feelings caused by arousal such as palpitations, tremors, or dizziness are harmless (Floyd, Garfield, & LaSota, 2005; Ranney et al., 2022).

Several psychological therapies have been evaluated for the management of migraine in adults. Psychological therapies provide skills such as coping strategies to help adults change their behavior or thoughts about migraine in an attempt to reduce migraine-related symptoms (Hellberg, Russell, & Robinson, 2019; Sepas, Shaker Dioulag, & Khademi, 2022). There is evidence that pain is often related to the processing of information and certain thoughts in relation to the interpretation of events and experiences, and cognitive behavioral therapy helps us understand the emotional cognitive implications of a person with migraine (Poursardar et al., 2019). Biofeedback as a migraine treatment has been widely investigated in various studies. The goal in this approach is to provide a platform to process traumatic and unpleasant memories in the person's mind and turn those memories into normal memories. The necessity of this issue is that traumatic memories cause changes in the mind and divert the brain from the proper analysis and processing of information (Nestoriuc, Rief, & Martin, 2008; Singhal & Varma, 2022). In addition to education, behavioral therapies and drug therapy, there are other ways such as acupuncture and Eye Movement Desensitization and Reprocessing (EMDR) to treat migraines (Maxfield, 2019). Eye Movement Desensitization and Reprocessing is an experiential therapeutic approach that therapists can use to treat the aftermath of trauma and other negative life experiences. Its clinical applications include a wide range of psychological problems on patients and family members, as well as physical disorders caused by stress and unexplained medical symptoms (Staton, Wilde, & Dawson, 2022).

Therefore, the purpose of this research is to compare the effectiveness of cognitive behavioral therapy, biofeedback and EMDR on anxiety sensitivity in women with migraine.

## 2 Methods and Materials

### 2.1 Study Design and Participants

The current research was of an applied type and a quasi-experimental design of pre-test, post-test and follow-up with a control group, in which three separate experimental groups and one control group were used. The statistical population of the present study includes all women who visited Tehran's Cheshm Andaz Ayandeh clinic in 2022 due to migraine. Sixty people were randomly selected and then equally assigned to groups (15 people in each group). Also, the present study had a one-month follow-up phase.

### 2.2 Measures and Interventions

#### 2.2.1 Anxiety Sensitivity

The Anxiety Susceptibility Inventory (ASI) is a self-report questionnaire that has 16 items and was developed by Reiss and Patterson (1985). The structure of this questionnaire consists of three factors: fear of physical concerns (8 questions), fear of not having cognitive control (4 questions) and fear of being observed by others (4 questions). To check the internal stability, Cronbach's alpha coefficient was calculated, and this coefficient was obtained between 80% and 90%. The retest reliability after two weeks is 0.75 and for three years 0.71 has shown that anxiety sensitivity is a stable personality construct. Iranian researchers investigated the psychometric properties of this questionnaire. Its reliability was calculated based on three methods of internal consistency, retesting and classification, which obtained reliability coefficients of 0.93, 0.95, and 0.97 for the whole scale (Hellberg, Russell, & Robinson, 2019; Ranney et al., 2022; Sepas, Shaker Dioulag, & Khademi, 2022).

#### 2.2.2 Cognitive behavioral therapy

Cognitive behavioral therapy was performed based on the Otis, Keller and Chevelier's (2021) protocol in 12 90-minute sessions (Otis, Keller, & Chevalier, 2021).

#### 2.2.3 EMDR

EMDR was performed according to the protocol of Maxfield (2019) in 3 90-minute session (Maxfield, 2019).

2.2.4 Biofeedback

Biofeedback was performed according to the protocol of Mullally et al. (2009) in 15 60-minute sessions (Mullally, Hall, & Goldstein, 2009).

2.3 Data Analysis

In order to statistically analyze the data, analysis of covariance test, pairwise mean comparison and SPSS software were used.

3 Findings

The descriptive findings are reported in the Table 1.

**Table 1**

Descriptive findings (Mean and Standard Deviation)

Variable	Stage	CBT		EMDR		Biofeedback		Control	
		M	SD	M	SD	M	SD	M	SD
Anxiety Sensitivity	Pre-test	70.13	6.91	74.23	5.73	69.40	6.16	72.18	5.41
	Post-test	45.71	7.12	42.93	6.67	43.17	6.48	74.28	5.76
	Follow-up	50.31	7.05	49.67	6.31	45.62	5.94	73.63	6.19

According to Table 1, in the post-test, the mean scores of the experimental groups decreased. Covariance analysis was used to check the research hypotheses. Before the test, the prerequisites were checked. For this purpose, the normality of the data distribution was checked and confirmed using the Shapiro-Wilk test. Also, Levene's test results showed that

the equality of variances was established ( $p < 0.05$ ). Also, the results of the M-Box test showed that the significance of F is greater than 0.05 ( $p > 0.05$ ); Therefore, the assumption of homogeneity of the covariance matrix in the studied groups is met.

**Table 2**

ANCOVA results

Variable	Source	SS	df	MS	F	p	Effect size	Power	
Anxiety Sensitivity	Pre-test	Post-test	8602.82	1	8602.82	33.86	0.000	0.54	0.932
		Follow-up	8142.01	1	8142.01	36.45	0.000	0.64	0.842
	Between-group	Post-test	2917.13	2	1286.52	20.51	0.000	0.61	1.00
		Follow-up	3269.91	2	1202.950	15.98	0.000	0.52	1.00

As the results of the Table 2 show, by controlling the effect of pre-test scores for research variables, the difference of all 4 groups in both post-test and follow-up stages for anxiety sensitivity is statistically significant. The effect of group membership for the anxiety sensitivity variable was

0.61 in the post-test phase and 0.52 in the follow-up phase. It shows that group membership explains 0.61 of the changes in grades in the post-test stage and 0.52 in grades in the follow-up stage. In other words, the treatment methods improved 0.52 of anxiety sensitivity in the follow-up.

**Table 3**

Pairwise comparison of the means

Variable	Group 1	Adjusted Mean	Group 2	Adjusted Mean	SE	p
Anxiety Sensitivity	Post-test	CBT	EMDR	42.93	1.69	0.327
			Biofeedback	43.17	2.25	0.436
			Control	74.28	4.67	0.000
	EMDR	EMDR	Control	42.93	5.16	0.000
			Biofeedback	43.17	0.36	0.852

	Biofeedback	43.17	Control	74.28	4.93	0.000
Pre-test	CBT	50.31	EMDR	49.67	0.29	0.892
			Biofeedback	45.62	1.09	0.527
			Control	73.63	3.37	0.012
	EMDR	49.67	Control		3.67	0.010
			Biofeedback	45.62	0.95	0.489
			Control	73.63	4.67	0.000
Biofeedback	45.62					

The results of the pairwise comparison in Table 3 showed in the analysis that all three treatments had a significant effect on reducing anxiety sensitivity ( $p > 0.05$ ). However, these three treatments were similar in terms of their effect on anxiety sensitivity ( $p < 0.01$ ).

#### 4 Discussion and Conclusion

This study aimed to compare the effectiveness of cognitive behavioral therapy, biofeedback and EMDR on anxiety sensitivity in women with migraine. The results showed in the analysis that all three treatments had a significant effect on reducing anxiety sensitivity. However, these three treatments had similar effects on anxiety sensitivity.

One of the causes of migraines in women with migraine is their thoughts about migraines and constant worry about the occurrence of migraines and their interpretation of these thoughts. When they are taught to correct their perception of migraines and replace their misinterpretations, their frequency of migraines is greatly reduced. In fact, these people no longer have fear, apprehension, anxiety and the expectation of pain and migraine attacks (Otis, Keller, & Chevalier, 2021).

EMDR can also be used to help people with migraines who have high anxiety sensitivity to work on anxiety-provoking memories and fears that lead to the continuous activation of the warning system in the person and increase the sensitivity of people to the symptoms of migraine. Finally, they can improve these memories and reduce anxiety sensitivity (Maxfield, 2019; Staton, Wilde, & Dawson, 2022).

Finally, biofeedback allows the anxious individual to observe and manage their physiological responses to anxiety (Mullally, Hall, & Goldstein, 2009; Nestoriuc, Rief, & Martin, 2008). When a person experiences anxiety, some changes are displayed visually and audibly using non-invasive tools. Showing these features in women and helping

them to control their bodies consciously made them able to manage their anxiety sensitivity well and reduce it.

#### 5 Limitations and Suggestions

Among the limitations of this study, the following can be mentioned: The possibility of follow-up for more than one month and one stage was not available for the clients. It was not possible to continue the meetings consecutively over a time interval of several years for the present research. This research was conducted only on women and it was impossible to compare the two genders.

Considering the effectiveness of cognitive-behavioral treatments on pain attacks, anxiety sensitivity, quality of sleep and quality of life in people with migraine, it is suggested that this treatment be used for all people with this disease. Considering the effectiveness of desensitization treatments with rapid eye movements and reprocessing on pain attacks, anxiety sensitivity, quality of sleep and quality of life in people with migraine, it is suggested that this treatment be used for all people with this disease. Considering the effectiveness of biofeedback treatments on pain attacks, anxiety sensitivity, quality of sleep and quality of life in people with migraine, it is suggested that this treatment be used for all people with this disease.

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#### Declaration of Interest

The authors of this article declared no conflict of interest.

#### Ethics principles

In this research, ethical standards including obtaining informed consent, ensuring privacy and confidentiality were observed.

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