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The Effect of Eye Movement Desensitization and Reprocessing on Depression and Anxiety in Patients with Spinal Cord Injuries

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Abstract

Background: Spinal cord injury is one of the worst injuries incurred to the individual and family.
Objectives: The aim of the present study was to determine the effect of eye movement desensitization and reprocessing (EMDR) intervention on stress and anxiety of spinal cord injury (SCI) patients in Kermanshah, west of Iran.
Methods: This is a quasi-experimental study, which has been conducted for 6 months in 2018 - 2019. The study population consisted of SCI patients in Kermanshah province. The research instruments included demographic characteristics form, Beck's depression and anxiety inventories completed by patients in both groups after completing the written consent form using the self-report method. Random allocation was used to divide patients into experimental and control groups. To do so, patients were given a sealed card, and if the patient chose a white or black card, they will be placed in the experimental and control groups, respectively. Two sessions were held individually for each patient, and a total of 64 sessions of EMDR-based intervention were held for patients entered into the analysis phase. After data collecting and data entry to SPSS statistical software version 16, the data was analyzed with the use of descriptive statistical tests.
Results: Finding showed the mean (SD) of depression scores before intervention was 45.36 (9.81), which after intervention was reduced to 40.54 (4.25) ($P < 0.02$). Also, in relation to the amount of anxiety, the mean (SD) of the anxiety score of the patients before intervention was 43.15 (4.35), which after intervention was reduced to 20.03 (11.91). After intervention, reduction in anxiety score in patients was more than depression score ($P < 0.000$).
Conclusions: Considering that EMDR, as a non-pharmacological intervention, reduced depression and anxiety of patients, it is suggested that this technique, which is a free or non-complicated intervention for the healthcare system or patient, be carried out when providing clinical care to patients.

Keywords: Eye Movement Desensitization and Reprocessing, Depression, Anxiety, Spinal Cord Injuries

1. Background

Spinal cord injury (SCI) is one of the worst injuries incurred to the individual and family (1). SCI may occur due to an accident or a disease. Traumatic SCI may be due to vertebral dislocation, fracture or vascular injury or a combination of both. While factors such as infectious agents, tumors, multiple sclerosis, etc. can cause non-traumatic SCI (2, 3). SCI causes a lot of sensory-motor problems in the patient, which is why the patients face problems doing activities of daily living (ADL) such as personal hygiene, eating and self-care. (4, 5). SCI causes complications in various systems of the body and disability, and such disability can have a negative effect on the quality of life of patients (6, 7).

SCI is one of the chronic diseases that is associated with different psychological problems (8). These patients may also have post-traumatic stress disorder (PTSD), with an incidence rate of 8% - 25% (9, 10). One of the other psychological problems faced by these patients is depression and anxiety (11). Hatefi et al. reported in a review article in Iran that 53.5% of SCI patients suffer from depression (12). Tzanos et al. also showed in a study in Greece that 18.2% of SCI patients had depression (13). In a study on the anxiety complication among SCI patients, Pakpour et al. (14) and Lim et al. (15), showed that this group of patients suffer from varying degrees of anxiety, which is why it is vital to pay attention to depression and anxiety in these patients (14, 15).

In fact, accidents and disasters leading to SCIs require patients to have rehabilitation services after acute and chronic stages (16, 17). One of the rehabilitation services required by these patients includes psychological interven-

tions (8). One of the most effective psychological interventions on patients' health status is eye movement desensitization and reprocessing (EMDR) intervention (18). EMDR is a safe technique that does not have any complications for patients and uses regular and quick movements of the patient's eyes. EMDR is based on the "adaptive information processing model" (19), which is usable for all ages and its core includes change in inefficient experiences and thoughts stored (20). EMDR seeks to deal with events that cause negative emotions in patients (21). The EMDR technique requires patients to remember disturbing memories during a regular schedule while moving their eyes, which is why the thoughts are organized (22). EMDR has been used in various studies in Iran (23-25). For example, Rahimi et al. showed that implementation of this technique for 30 - 45 minutes reduced stress levels among patients on hemodialysis. (23). Sadeghi et al. also showed that this technique reduced PTSD caused by accidents (24). In addition, findings of Marofi et al.'s study, showed that 45 - 60 minutes implementation of this technique reduced the pre-surgery anxiety of patients aged 12 - 18 years, which indicates the effectiveness of such a technique (25). Although there have been EMDR studies in Iran, researchers have not found any study on SCI patients.

2. Objectives

SCI patients need effective interventions to reduce their depression and anxiety. EMDR is one of the effective and low-cost interventions. Regarding the effect of depression and anxiety on the health status of these patients and since there have been few studies so far in this field, the aim of the present study was to determine the effect of EMDR intervention on depression and anxiety of SCI patients in Kermanshah, west of Iran.

3. Methods

3.1. Study Type and Setting

This is a quasi-experimental study, which has been conducted for 6 months in 2018-2019. The study population consisted of SCI patients in Kermanshah province.

3.2. Sample Size and Sampling

According to previous studies (25-27), 60 patients were selected as the patient population of the present study. However, due to the probability of the sample size dropping, at the beginning of the study, 75 patients (38 in the experimental and 37 in the control group) were included. In the control group, two patients were excluded, and 35 patients entered the analytical phase and in the experimental group five out of them were Excluded and 33 patients entered the analytical phase.

3.3. Inclusion Criteria

Inclusion criteria included having SCI, individuals age between 18 - 65 years, having at least a reading and writing literacy, a lack of participation in the same classes together or over the past 6 months, and absence of other chronic disease other than SCI.

3.4. Exclusion Criteria

Exclusion criteria also included the patient's unwillingness to participate in the study, being absent in the interventions even a single session, and creating any stressful event (such as death or accident for relatives of the patient, hospitalization, etc.) during the study.

3.5. Data Gathering Tools

The research instruments included demographic characteristics form (gender, age, marital status, duration of the disease (years), education, family support, income per month), Beck's depression and anxiety inventories were completed by patients in both groups after completing the written consent form using the self-report method.

3.5.1. Beck's Depression

Consists of 21 questions, with the possible score range of 0 - 3. The inventory is scored as follows: no or lowest depression (0 - 9), mild depression (10 - 18), moderate depression (19 - 29), and severe depression (30 - 63). The validity and reliability of this questionnaire have been confirmed in previous studies (28-30).

3.5.2. Beck's Anxiety

The questionnaire also consists of 21 questions on anxiety, with the lowest and highest scores of 0 and 3, respectively. The inventory is scored as follows: no or the lowest anxiety (0 - 7), mild anxiety (8 - 15), moderate anxiety (16 - 25), and severe anxiety (26 - 63). Reliability and validity of this questionnaire has also been confirmed in previous studies (31-33).

3.4. Data Collection and Intervention

Random allocation was used to divide patients into experimental and control groups. To do so, patients were given a sealed card, and if the patient chose a white or black card, they will be placed in the experimental and control groups, respectively. Two sessions were held individually for each patient, and a total of 66 sessions of EMDR-based

intervention were held for patients entered into the analysis phase. The procedure was as follows: The EMDR method consists of eight stages. The first stage includes taking history, designing the treatment, preparing the patient, and evaluating him/her. At this stage, they are listening to the disease-induced problems and they cope with them and are used to strengthen the therapeutic relationship. The researcher performed the second phase and told the patients about their realistic expectations from the treatment effects. At this stage, the EMDR process is achieved by stimulating the memory, and the client is asked to conceive a scene or a memory of the disease that caused the mental disturbance of the patient and his mind's concern. In the third step of this technique, the clients are asked to identify an image, a safe place, or a memory where they feel comfortable so that they imagine and can tolerate unpleasant feelings. The fourth stage of this technique is the stage of desensitization and the disturbing emotions of SCI patients are targeted. The fifth stage deals with cognitive restructuring and reprocessing. The remaining physical tensions are evaluated in the sixth stage. In the last two stages of this technique, completion and evaluation is carried out; in other words, the seventh stage ensures that the patient achieves stability at the end of the sessions. The patient is requested to record what may happen during the sessions in a notebook in the form of thoughts, conditions, memories, dreams, and other issues. Finally, the last step of this technique is to re-evaluate the therapeutic effects (23, 34-36). The EMDR-based intervention was then performed for the experimental group during 2 sessions of 45 - 60 minutes.

3.5. Ethical Considerations

The written consent form, which included full explanations of the goals and methodology of the research, was given to the patients prior to the start of the research. They were told that it is completely optional to participate in or withdraw from the research at any time. They were also ensured about the principle of confidentiality of information, imposing no costs, and emphasis on announcing the results in a general manner.

3.6. Statistical Analyses

After data collection and data entry to SPSS statistical software version 16, the data analyzed with the use of descriptive statistical tests (mean and standard variation) as well as analytical statistical tests (independent *t*-test, ANOVA, Pearson correlation coefficient, intensity correlation).

4. Results

The results of Table 1 showed that the majority of male patients (60.6% in the experimental group and 71.4% in the control group), single (72.7% in the experimental group and 60% in the control group), the duration of the disease between 3 - 5 years (57.6% in the experimental group and 57.1% of the control group), high school diploma and low literacy education (78.8% in the experimental group and 62.9% in the control group), medium family support (54.5% in the experimental group and 65.7% in the control group) and poor income (In the experimental group 75.8% and in the control group 77.1%).

According to the findings of Table 2, the mean (SD) of depression scores before intervention was 45.36 (9.81), which after intervention was reduced to 40.54 (4.25) ($P < 0.02$). Also, in relation to the amount of anxiety, the mean (SD) of the anxiety score of the patients before intervention was 43.15 (4.35), which after intervention was reduced to 20.03 (11.91). After intervention, reduction in anxiety score in patients was more than depression score ($P < 0.000$).

5. Discussion

The findings showed that EMDR reduced depression and anxiety in patients, which shows the effectiveness of EMDR as a non-pharmacological and non-complicated technique. This technique has not been performed on the SCI group, and this is why the researcher compares the results of this study with other groups of patients. Other studies have evaluated the effect of this technique on the patient's health status and their results are consistent with the results of the present study. Carletto et al. showed in a study in Italy that the EMDR reduces PTSD in patients (37). In a systematic study, Valiente-Gomez et al. reviewed 17 studies that evaluated the effect of EMDR in reducing the psychological problems of trauma patients, and the results showed that EMDR can lead to improved psychotic symptoms, chronic and affective pain (38).

EMDR has been effective in different patient groups with psychological problems. For example, Nazari et al., used EMDR and citalopram for patients with the obsessive-compulsive disorder (OCD). The results showed that both interventions had a positive effect on the obsessive signs of the patients, but EMDR had a greater effect on patients' final outcome than the citalopram group (39). Triscari et al. also showed that EMDR and a combination of psychological interventions reduced flight anxiety (40), which is consistent with the results of the present study. Perez-Dandieu et al. also showed in a study that EMDR reduced depression in trauma patients (41). Wood et al. (42) and Gauhar (43) also showed that EMDR reduced depression in patients.

Table 1. Demographic Data of the Experimental and Control Group Patients

Demographic Variables	No. (%)		P Value
	Experimental	Control	
Gender			
Male	20 (60.6)	25 (71.4)	0.35
Female	13 (39.4)	10 (28.6)	
Marital status			
Married	9 (27.3)	14 (40)	0.27
Single	24 (72.7)	21 (60)	
Duration of the disease, y			
1 - 2	7 (20)	7 (20)	0.85
3 - 5	19 (57.6)	20 (57.1)	
More 5	7 (21.2)	8 (22.9)	
Education			
Reading and writing literacy	4 (12.1)	6 (17.1)	0.66
Diploma and low literate	26 (78.8)	22 (62.9)	
Collegiate	3 (9.1)	7 (20)	
Family support			
Low	3 (9.1)	5 (14.3)	0.14
Medium	18 (54.5)	23 (65.7)	
A lot	12 (36.4)	7 (20)	
The income per month, Rials			
Less than 500 thousand	25 (75.8)	27 (77.1)	0.70
500 to 1 million	7 (21.2)	8 (22.9)	
More than 1 million	1 (3)	0 (0)	
Age, M ± SD	48.66 ± 12.66	49.17 ± 10.13	0.85

Table 2. Comparison of Depression and Anxiety in patients with SCI Before and After Intervention

Variable	M ± SD		P Value, T
	Before Interventoin	After Interventoin	
Depression			
Experimental	45.36 ± 9.81	40.54 ± 4.25	0.02, 2.39
Control	43.48 ± 8.54	43.57 ± 7.41	0.90, -0.11
P value, F, T	0.40, 0.24, 0.84	0.04, 7.46, -2.04	-
Anxiety			
Experimental	43.15 ± 4.35	20.03 ± 11.91	0.000, 10.10
Control	44.68 ± 4.19	45.14 ± 4.79	0.36, -0.97
P value, F, T	0.14, 0.38, -1.47	0.000, 14.38, -11.50	-

Behnammoghadam et al. also revealed that EMDR reduced depression in patients with myocarditis (44). In a study on two adolescents aged between 14 and 16 years, Bae et al. showed that EMDR technique reduces depression in adolescents (45), which is consistent with the results of the present study showing the effectiveness of EMDR on reducing depression in patients.

5.1. Conclusions

Considering that EMDR, as a non-pharmacological intervention, reduced depression and anxiety of patients, it is suggested that this technique, which is a free or non-complicated intervention for the healthcare system or patient, be carried out when providing clinical care to patients.

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Footnotes

Authors' Contribution: Study concept and design: Masoud Hatefi and Asma Tarjoman. Analysis and interpretation of data: Milad Borji and Shahriyar Moradi. Drafting of the manuscript: Masoud Hatefi and Asma Tarjoman. Critical revision of the manuscript for important intellectual content: Asma Tarjoman. Statistical analysis: Milad Borji and Shahriyar Moradi.

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