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The effect and comparison of mindfulness-based stress reduction training and the combination of mindfulness-based stress reduction and Transcranial Direct Current Stimulation (TDCS) on the stress intensity of migraine sufferers

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Abstract

Introduction: Migraine headaches, as the third most common disease in the world and the sixth cause of disability, affect an average of 10% of the world's population. Due to the neurological nature of this disease, many cognitive functions of the patient, such as memory, attention, decision making, etc., are affected and impaired. Also, this chronic disease periodically and debilitatingly affects the quality of life, relationships and productivity of patients.

Methods: The aim of this study was to evaluate the effect and compare mindfulness-based stress reduction training and the combination of mindfulness-based stress reduction training and Transcranial Direct Current Stimulation (TDCS) to the stress intensity of migraine sufferers.

Results: The present study is applied research in terms of purpose, and is a complete experiment in terms of data collection with pre-test, post-test and follow-up design and control group. The statistical population of this study was all migraine patients aged 30 to 45 years who referred to Imam Khomeini Hospital in 2009. Finally, 49 were divided into three groups. The first group received mindfulness-based stress reduction training, the second group received a combination of mindfulness-based stress reduction methods with Transcranial Direct Current Stimulation (TDCS), and the third group, the control group, as a comparison group, received unstructured training programs such as time management and review of their daily and weekly tasks. The

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research instrument was the Harry Stress Intensity Questionnaire (2000) and repeated measure analysis.

Conclusion: The findings showed that mindfulness-based stress reduction training method and a combination of mindfulness-based stress reduction and Transcranial Direct Current Stimulation (TDCS) reduced stress, compared to the control group reduced stress. The combination of mindfulness-based stress reduction and Transcranial Direct Current Stimulation (TDCS) was more effective in reducing stress than just the mindfulness-based stress reduction training method.

Keywords: Mindfulness-based stress reduction" Migraine" Transcranial Direct Current Stimulation (TDCS)" Stress

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Introduction:

One of the most serious human problems has been stress, from the past to the present. The complexity of life in today's world is such that dealing with all kinds of stress and tension is inevitable, and as long as humans have to deal with different stresses, they are vulnerable and their adaptation to the environment is at risk. Therefore, for maintaining physical and mental health and well-being, acquiring skills to deal effectively with stress is of particular importance.

Unpredictable and uncontrollable events cause more stress than events that the person has more control over them. Human reactions to stress are different, so that the level of stress tolerance is very high in some and very low in others. This tolerance is influenced by several factors, including genetic factors, individual past experiences, personality traits, individual previous conditioning, and individual experiences in the family environment. People raised in family environment where stress has persisted for years tend to respond more strongly to stress.

The word migraine is derived from the Greek word (Hemicrain meaning half of the head), which itself has its roots in the Egyptian language. Migraine is a headache disorder characterized by a combination of neurological and gastrointestinal changes. Migraine pain is often a unilateral throbbing pain that is mild at first and gradually gets worse. Migraine pain in all cases is accompanied by anorexia and nausea and sometimes vomiting.

During migraine attacks, patients are clearly intolerant to light (photophobia) and go to a dark place to rest. There may be intolerance to sound (phonophobia) and sometimes osmophobia. In

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children, migraines are often associated with attacks of abdominal pain, motion sickness, and sleep disorders. Late onset of migraines (over the age of 50) is rare; however, a recurrence of a recovered migraine is not uncommon.

Diagnosis is based on the characteristics of the headache and associated symptoms, because the results of physical examinations and laboratory studies are usually normal. Several types of migraines have been described, the most common of which are: normal migraine (migraine without prodromal) and classic migraine (migraine with prodromal stage).

This type of headache, like cluster headaches, is very severe and usually occurs in one part of the head. This headache is so severe that it interferes with a person's daily activities. Migraines can cause nausea, vomiting, visual impairment, and photophobia. Migraine sufferers are unable to respond to natural stimuli such as light, sound, and even pain symptoms, and as a result, the pain intensifies. When migraines occur, the brainstem suffers from malfunction and lack of proper functioning. The brainstem is the part of the brain that controls hunger and respiration related reactions. This part is also responsible for repelling unwanted signals, and excessive and unwanted signals invade the brain, when is disturbed, and fill the brain with extra loads. Among all the medications used to treat migraine headaches, Anticonvulsants are the most widely used, but it has side effects such as fatigue and physical bruising. Patients with migraines experience a variety of psychological problems, including high stress. A variety of methods have been used to deal with chronic pain and reduce the psychological problems of patients. Reviewing studies focused on spinal cord stimulation in patients with unsuccessful lumbar surgery syndrome, Turner et al. concluded that more than 50% of patients experienced pain reduction in the short term after receiving after surgery spinal cord stimulation. But the pain intensified in the long term. A variety of non-pharmacological methods have also been used to treat chronic pain, including migraine headaches, such as Cognitive-behavioral therapies (3), Acceptance and commitment-based therapies (4; 5), and, in general, third-generation therapies or postmodern treatments such as mindfulness-based stress reduction training (mindfulness-based stress reduction) and brain current stimulation techniques such as Transcranial Direct Current Stimulation (3). Given the lack of similar research in Iran, the main question of the present study is whether mindfulness-based stress reduction training is effective in reducing the stress intensity of migraine sufferers? And whether a combination of mindfulness-based stress reduction and brain current stimulation is effective in reducing the stress intensity of migraine sufferers?

Research by Sharma and Rush (2014) showed that mindfulness-based stress reduction is effective in reducing stress. The results of Song and Lindquist (2014) report the effectiveness of mindfulness-based stress reduction in increasing mindfulness. Explaining these results, it should be noted that mindfulness-based stress reduction helps to reduce individual's stress by increasing mindfulness. Many people follow negative patterns of interaction when a conflict arises, which strongly provokes the initial conflict, but the mindful person tends to look at events, issues, and events through the others viewpoint, and less likely to biased attributions (5). Mindfulness also

makes people feel more secure in their romantic relationships and less stressed when conflict arises. If couples try to keep their relationship constant and ignore the changes that will inevitably occur during their life, the likelihood of conflict and dissatisfaction will increase; while mindfulness makes one receptive to changes and new and different aspects of life; In fact, mindful people find change less threatening (8). Mindfulness-based stress reduction is also effective in reducing stress. Conflict is more common in couples who experience higher stress (6). Stress affects people's health, well-being, quality of life, family and work life (7). Therefore, reducing stress has an effective role in reducing marital conflicts and disputes. Also, higher levels of mindfulness have a significant correlation with greater ability to manage negative emotions. Therefore, mindfulness-based stress reduction can be effective in modulating emotional schemas. Conflicts between couples' emotional schemas are the cause of conflict in most difficult couples (9).

In general, migraine sufferers are usually ambitious and perfectionist individuals, who like to live according to a plan, are critical of themselves, and many are more likely to reproach with others and need to be ahead of others. These patients often react to the frustrations caused by their relationship with people, in the form of constant anger and resentment that will certainly not be sufficiently vent. But why an emotional reaction in a person affects the arteries of the skull and, for example, does not cause the muscles contraction in this area, is a question that has not yet been answered. Sometimes the effects of stress on a person last for a long time and the person becomes stressed again by remembering them or seeing similar things.

Explaining this finding, it can be said that people with high mindfulness can create a constantly dynamic and flexible environment in their lives, due to having control over time and not being afraid of change. This dynamic and flexible environment prevents the growth of chronic conflicts and long-term psychological and emotional distances, which themselves will create a chain of problems. The important point is that people with high mindfulness are paying close attention to their point of view and that of their spouse, and this point acts as a means to keep the relationship dynamic and prevent the distance, and ultimately increase the quality of life (6). Langer (1989) believes that in a mindfulness relationship, the ideas and attitudes of an individual or a relationship are more interchangeable. This mindfulness sensitivity creates lasting effects on couples to solve problems with respect, intimacy and empathy. People with high mindfulness are not only aware of themselves and their internal and external situation, but also have high awareness of changes in their spouse's appearance and behavior. This awareness will contribute to change, empathetic attention while increasing the quality of life (8).

Research method:

The present study is applied research in terms of purpose, and is a complete experiment in terms of data collection with pre-test, post-test and follow-up design and control group, and is field research. The data of this research are quantitative and at the level of interval scale.

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The target statistical population of this study was all migraine patients aged 30 to 45 years. The statistical population is all migraine patients aged 30 to 45 years referred to Imam Khomeini Hospital in Tehran in 2009. The sample of this study was available through sampling method. Finally, all three experimental and control groups, which consisted of 49 subjects, were equally randomly divided into experimental groups (N=17) and control group (N=15), and finally attended 8 experimental sessions. The first group received mindfulness-based stress reduction training, the second group received a combination of mindfulness-based stress reduction methods with Transcranial Direct Current Stimulation (TDCS), and the third group, the control group, as a comparison group, received unstructured training programs such as time management and review of their daily and weekly tasks. Before conducting pre-test research at the end of training, post-test and one month after training, follow-up was performed. At the end of the study, 4 out of people in the mindfulness-based stress reduction experimental group (N=17) left and 13 people remained, of the patients in the second experimental group (N=17), a combination of mindfulness-based stress reduction and Transcranial Direct Current Stimulation (TDCS), 3 people were excluded and 14 remained, of the control group of 15 people (N=15), 4 people did not continue the research and finally 11 people remained who were evaluated in post-test and follow-up.

Inclusion criteria for the study participants were: having the main and predominant diagnosis of any type of migraine disorder; Age range between 30 and 45 years; Patient attendance at Imam Khomeini Hospital in Tehran; Minimum diploma literacy. Exclusion criteria of the participants in the study were: the presence of obvious physical diseases such as (epilepsy, cerebral palsy); Presence of neurological diseases (other than migraine) and psychotic; More than two sessions of absence in treatment sessions; The presence of disorders such as Alzheimer's, or common psychiatric illnesses based on patient records and self-reported; Failure to meet or contrary to any of the entry criteria during the intervention period.

The Harry Stress Questionnaire was developed by Dr. S. Chandran Harry in 2000 to measure stress in various life situations, including chronic patients. This test contains 66 items that the respondent must express their answers in a 5-point Likert scale from strongly agree to strongly disagree, and is prepared for 12 years and older people. In Iran, this questionnaire has been used in various studies, especially for cancer patients, and has the necessary validity.

The answers to this test are in a range of 5 degrees from do not accept at all to completely accept, so that 1, 2, 3, 4, 5 score are given to, respectively, I do not accept at all, I do not accept, I do not know, I accept, and I completely accept. Of course, in phrases 2, 4, 6, 8, 11, 13, 14, 16, 17, 31, 43, 44, 46, 48, 49, 60, 64, 65, scoring is reverse, so that 5, 4, 3, 2 and 1, are given to, respectively, I do not accept at all, I do not accept, I do not know, I accept, and I completely accept. If the total score is higher than 150, the person is suffering from stress and it is necessary to change the existing conditions of his life, and if the total score of the person is higher than 250, patients must be under specialized care. Due to the experimental nature and implementation of the educational program for each group, the present study was conducted in several stages:

Experimental Group 1: Mindfulness-Based Stress Reduction Sessions (Mindfulness-Based Stress Reduction)

Subjects completed a stress, quality of life, and cognitive function test during an introductory session.

Session 1: 1. Introduce the participants and a brief description of the 8 sessions; 2. The technique of eating raisins and then body scan meditating for 30 minutes, and talking about the feelings caused by doing these meditations 3. Homework: mindfulness and expanding the technique Eat raisins for other activities.

Purpose: move from life "in auto-pilot" to life with consciousness and conscious choice. Living in auto-pilot can trap us in negative mental states such as "mental rumination". By doing these exercises and increasing awareness, we respond to situations voluntarily and with more choice, instead of habitual or automatic behavior.

Session 2: 1.do body scan meditation and discussing this experience; 2.talk about homework, barriers to practice, and mindfulness program solutions; 3.discussing the difference between thoughts and feelings; 4.do meditation while sitting 5.homework: Mindfulness of a pleasant event, do sitting meditation and body scan and mindfulness of a routine activity.

Purpose: moves from communication with experience from within thought to direct and immediate sensation. Our main intention of this program is to become more aware for more and more times. Our tendency to judge our experiences does not allow us to be on the right way. If we go through our experiences without judgment, we will achieve awareness.

Session 3: 1. Practice seeing and hearing (in this exercise participants are asked to look and listen non-judgmentally for 2 minutes); 2. Sitting Meditation and breathing according to the physical senses 3. Discussion of homework; 3-minute breathing space exercise, this meditation has three stages: paying attention to the exercise in the moment of doing, paying attention to breathing and paying attention to the body; 4. Do one of the mindfulness movement exercises; 5. Homework: sitting meditation, body scan, 3-minute breathing space exercise, mindfulness of a new daily activity, and mindfulness of unpleasant events.

Purpose: move towards being and full presence in the present moment, instead of being involved with the past or the future. This week we will discover how and where we are and we can learn not to get caught up in the useless and unwanted consequences of mental travel in time and calm our disturbed and scattered minds, and experience peace and tranquility.

Session 4: 1. Sitting meditation with regard to breathing, body sounds and thoughts (also called four-dimensional sitting meditation); 2. Talk about an individual's stress responses and reactions to difficult situations and alternative attitudes and behaviors; 3. Mindfulness steps exercise; 4.

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Sitting meditation homework, body scan or one of the mindfulness body movements and 3-minute breathing space practice (in an unpleasant event)

Purpose: Instead of trying to avoid, and get rid of unpleasant experiences, let us move toward them willingly. How we face difficulties causes us to control them or they control us. As we become more aware of the thoughts and feelings and bodily sensations evoked by events, we free ourselves from the habitual and automatic methods of reactions, and as a result we respond with mindfulness and skill.

Session 5: 1. Sitting meditation; 2. Presenting and performing mindfulness body movements 3. Homework: Sitting meditation; 3-minute breathing space practice in an unpleasant event and mindfulness of a new routine activity.

Purpose: Instead of trying to change everything, let them stay as they were. In these exercises, we become conscious of whatever dominates our moment-by-moment experience. We must first accept and stop trying to change them and let the experiences remain as they are. Acceptance does not mean surrender, but it allows us to be aware of difficulties.

Session 6: 1. 3-minutes breathing exercises; 2. Talk about homework in groups of two; 3. Presenting an exercise entitled "Creation, Thought, Separate Perspectives" with this sense: The content of thoughts is often not real; 4. Accepting emotions as feelings; 5. Homework: Choosing a combination of meditations that is a personal preference. In addition do three minutes breathing space in an unpleasant event and mindfulness of a new daily activity.

Purpose: Thoughts are not reality but only mental events. Our thoughts have a powerful effect on our emotions and behavior. Most thoughts are automatic when they begin. So the more we become aware of them through practice, the more we can distance from them and reduce their dominance. As a result, we realize that thoughts are only mental events, and we become aware of their consequences.

Session 7: 1. Four-dimensional meditation and awareness of everything that comes to consciousness in the moment; 2. The sense of this session is: What is the best way to take care of myself?; 3. Provide an exercise in which participants identify which events in their lives are pleasant and which are unpleasant, as well as how to make a plan that has enough enjoyable events; 4. Teaching acceptance without judgment; 5. Homework: Do a combination of meditation that one prefers, a 3-minutes breathing exercise in an unpleasant event. Mindfulness of a new routine activity.

Purpose: Instead of threatening or criticizing ourselves, move towards taking care of ourselves with kindness and compassion. What we do in our time can all have a powerful effect on our health and well-being and our ability to skillfully deal with problems. The more real we are in the moments of life, the better we can make mindfulness decisions.

Session 8: 1. Scanning; 2. The sense of this session is: Using what you have learned so far; 3. Practicing 3-minutes breathing space; 4. Talk about ways to cope with obstacles to meditation; 5. Ask questions about the whole session, for example, did the participants gain self-control? Do they feel that their personality has grown? Do they feel that their coping skills have improved and do they like to continue their meditation exercises?

Purpose: Planning for mindfulness future by understanding the benefits of awareness and consciousness and accepting and mindfulness responding, instead of showing immediately "automatic or pre-programmed reactions", we make a new plan. (We have to understand that some things are unchangeable and some are changeable, and then we can plan for them by visualizing them).

At the end of the eighth session, the subjects completed the relevant questionnaires.

One month after the end of the administration, the follow-up stage was performed and the subjects answered the stress intensity questionnaire.

Experimental group 2: Combination of mindfulness-based stress reduction and Transcranial Direct Current Stimulation (TDCS)

Subjects completed a stress, quality of life, and cognitive function test during an introductory session.

Intervention sessions are organized in 8 sessions (2 sessions per week) for about 2 hours. The first 40 minutes of each session include 10 minutes of preparation for Transcranial Direct Current Stimulation and 30 minutes of mindfulness exercises along with receiving stimulation. The final 1 hour is devoted to explaining the done process. 36 subjects are randomly divided into 3 groups. Twelve people in the control group receive only mindfulness-based stress reduction exercises.

Fifteen people in the experimental group receive mindfulness-based stress reduction exercises and 2.0 mA Transcranial Direct Current Stimulation at point F3 of the 10.20 EEG International System (anode) and right shoulder (cathode). Fifteen people in the stimulation group receive mindfulness-based stress reduction exercises and 0.1 mA Transcranial Direct Current Stimulation at point F3 of the 10.20 EEG International System (anode) and right shoulder (cathode).

At the end of the eighth session, the subjects completed the relevant questionnaires.

One month after the end of the administration, the follow-up stage was performed and the subjects answered the stress intensity questionnaire.

Control group: time management program and review of daily and weekly tasks

The subjects in the control group completed the stress, quality of life and cognitive functions test during a preliminary session.

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The control group, as a comparison group, received their non-structured training program such as time management and review of their daily and weekly tasks in the form of 8 sessions of approximately 2 hours. Accordingly, most of the content of the meetings included answering individual's questions and behavior, as well as daily conversations on political and social issues and ordinary conversations, which, according to oral polls, almost all of them were satisfied with such periodic meetings.

At the end of the eighth session, the subjects completed the relevant questionnaires.

One month after the end of the administration, the follow-up stage was performed and the subjects answered the stress intensity questionnaire.

Results:

Table 1 presents the mean and standard deviation of the variable studied in migraine sufferers in the experimental groups, mindfulness-based stress reduction training, and a combination of mindfulness-based stress reduction and Transcranial Direct Current Stimulation and control group.

The noteworthy point in this table is that the scores of the participants in the control and experimental groups in the pre-test are very similar, however, we can see the differences between the groups in post-test and follow-up stage, due to the effect of educational intervention.

Table1: Mean and standard deviation of experimental and control groups

Groups	levels	test	Statistical indicators	Stress
Groups	mindfulness-based stress reduction	Pre-test	mean	46.41
			Standard deviation	3/23
		Post-test	mean	35/12
			Standard deviation	15/35
		Follow up	mean	37/58
			Standard deviation	13/36

Effect of combination of mindfulness-based stress reduction and Transcranial Direct Current Stimulation	Pre-test	mean	46/95
		Standard deviation	4/65
	Post-test	mean	29/20
		Standard deviation	17/57
	Follow up	mean	31/20
		Standard deviation	18/05
control	Pre-test	mean	35/16
		Standard deviation	5/52
	Post-test	mean	36/04
		Standard deviation	35/086
	Follow up	mean	35/87
		Standard deviation	6/87

In order to examine the first hypothesis, the scores of the participants in completing the Harry Stress 2000 questionnaire in the pre-test, post-test and follow-up stages were statistically analyzed, the results of which are presented in the following tables. Repeated measurement test was used to examine this variable. Table 2 presents the results of the Moachley's test of Sphericity to investigate the hypothesis of multivariate analysis of variance in the hypotheses and research question.

Table2: Results of Moachley's test of Sphericity to investigate the hypothesis of multivariate analysis of variance in the hypothesis and research question

row	Indicators

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		Moachley's test of Sphericity	W Moachley	Chi squares	degree of freedom	Significance level
hypothesis		stress intensity	۰/۶۷	۱۰/۷۲	۱	۰/۰۰۵
research question		stress	۰/۶۷	۱۰/۷۲	۲	۰/۰۰۵

The results of Table 2 show that the Moachley's test of Sphericity is significant for stress in the first hypothesis and stress in the research question. The result obtained assuming the sphericity of the Greenhouse-Geiser test should be used instead of Sphericity Assumed of Huynh- Feldt and Lower- bound. The results of these tests are presented in Table 3.

Table3: Results of within-subject effects tests for experimental and control groups

test	Sum square	degree of freedom	mean square	**F**	Significance level
Group	۲۵۱٤,۷۲	۱	۲۵۱٤,۷۲	۸,۳٦	۰/٤٥٦
Greenhouse - Geiser	٥۲۸٦,۰٦	۱,٥۰	۳٥۰۹,۲٤	۲٤,۱٤	۰/۰۰۱
Time*Group	۲۷٥٥,۳٥	۱,٥۰	۱۸۲۹,۱۹	۱۲,٥۸	۰/۰۰۱
error	٦۱۲۹,۹۱	٤۲,۱۷	۱٤٥,۳۳	-	-

The results show that the control and experimental groups have a significant difference in at least one of the pre-test, post-test and follow-up tests because the Greenhouse Geiser test is significant at 0.001 level. Also in the table above, the effect of time and group factor shows that all individual under training have improved over time. But there is no difference between the groups in the group factor, ie in the pre-test stage.

Table 4 Results of multivariate analysis of variance tests to compare stress based on group variable

Source of variance	Test name	Value	df Hypothesis	df error	F	Significance level
The effect of mindfulness-based stress reduction training	Pilay effect	۰,۵۲	1	22	14.84	۰/۰۰۱
	Wilkes Lambda	۰,٤۷	1	22	۱٤,۸٤	۰/۰۰۱
	Hoteling's trace	۱,۰۹۹	1	22	۱٤,۸٤	۰/۰۰۱
	Roy's Largest Root	۱,۰۹	1	2	۱٤,۸٤	۰/۰۰۱

Table 4 shows the results of multivariate analysis of variance, Pilay effect, Wilkes lambda, hoteling's trace and the Roy's largest root for stress comparison based on group variable. Based on the information in Table 4, it can be said that the groups are different in terms of stress. That is,) in the experimental and control groups, there is a difference between at least one of the stress tests (pre-test, post-test and follow-up). It should be noted that the significance of multivariate analysis of variance tests does not indicate in the experimental and control groups, there is a difference between which tests (pre-test, post-test and follow-up). To examine these differences, dual comparisons were performed, the results of which are listed in Table 5.

Table5: Dual comparisons of experimental and control groups in stress pre-test, post-test and follow-up

Source of variance	comparisons	Sum square	degree of freedom	mean square	F	Significance level
time	Pre-test - post-test	۷٦٤۸,۰۳	۱	۷٦٤۸,۰۳	۲۷,۱۳	۰/۰۰۱**
	Post-test - follow-up	۹,٦۳۳	۱	۹,٦۳۳	۰,۱۰۲	۰/٦۲
Time*Group	Pre-test - post-test	۳٦٥۲,۰۳	۱	۳٦٥۲,۰۳	۱۲,۹٥	۰/۰۰۱**
	Post-test - follow-up	٥۰,۷	۱	٥۰,۷	۰,٥٤۱	۰/٤٦
Error	Pre-test - post-test	۷۸۹۲,۹۳	2	۲۸۱,۸۹		-

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	Post-test - follow-up	٢٦٢٠,٦٧	2	٩٣,٥٩٥	-

As can be seen from Table 5, there is a significant difference between the pre-test and post-test scores of the experimental group. This result shows that mindfulness-based stress reduction training is effective in reducing stress symptoms in people with migraines. The table also shows that there is no significant difference between the pre-test and post-test scores of the experimental group, which means that the subjects in the experimental group who received low scores in stress post-test, obtained approximately the same scores on the follow-up test. This finding indicates that mindfulness-based stress reduction training has good stability in reducing the stress symptoms of people with migraines over time.

Hypothesis 2: Simultaneous combination of mindfulness-based stress reduction methods and Transcranial Direct Current Stimulation (TDCS) is effective in reducing the stress intensity of migraine patients.

In order to examine the first hypothesis, the scores of the participants in completing the stress intensity in the pre-test, post-test and follow-up stages were statistically analyzed, the results of which are presented in the following tables.

Repeated measurement test was used to examine this variable. Table 2 represents the results of the Moachley's test of Sphericity to investigate the assumptions of multivariate analysis of variance of intergroup stress intensity. The results of Table 2 show that the Moachley's test of Sphericity is not significant. The result obtained assuming the sphericity of the Greenhouse-Geiser test should be used instead of Sphericity Assumed of Huynh- Feldt and Lower- bound. The results of these tests are presented in Table 6.

Table 6 Results of multivariate analysis of variance tests to compare stress based on group variable

Source of Variance	Test Name	Value	df hypothesis	df error	F	Significance level
The main effect of stress intensity	Pilay effect	٠,١٧	1	23	٤,٣١	٠/٠٢
	Wilkes Lambda	٠,٨٢	1	23	٤,٣١	٠/٠٢
	Hoteling's trace	٠,٢١	1	23	٤,٣١	٠/٠٢

	Roy's Largest Root	۰,۲۱	1	23	٤,۳۱	۰/۰۲

Table 6 shows the results of multivariate analysis of variance, Pilay effect, Wilkes lambda, hoteling's trace and the Roy's largest root for comparing stress intensity based on group variable. Based on the information in this table, it can be said that the groups are different in terms of stress intensity. That is, there is a difference in stress intensity between at least one of the tests (pre-test, post-test and follow-up) in the experimental and control groups. It should be noted that the significance of multivariate analysis of variance tests does not indicate in the experimental and control groups, there is a difference between which tests (pre-test, post-test and follow-up).

Table 7: Results of within-subject effects tests for experimental and control groups

Test	Sum square	degree of freedom	mean square	F	Significance level
Group	۱۱۰۷,۳۳	۱	۱۱۰۷,۳۳٤	۰,۷۳	۰/۳۹
Greenhouse - Geiser	٦٥٨٧,٦٦	۲	۳۲۹۳,۸۳۳	٥,۲۸	۰/۰۰۹
Time*Group	۸۳٥٤,٥۷	۲	٤۱۷۷,۲۸۷	٦,۷۰	۰/۰۰۳
Error	٥۲۳٥۸,۰۲	23	2276.43	-	-

The results obtained in the group row show that there is no difference between the control and experimental groups in the pre-test stage. but these groups are significantly different in at least one of the pre-test, post-test and follow-up tests because of the time factor. Because Sphericity Assumed Test is significant at 0.009 in the time dimension. Also, in Table 7, the effect of time and group factor shows that all people under training have improved over time.

Table 8 Double comparisons of experimental and control groups in pre-test, post-test and follow-up of stress intensity

Source of Variance	Comparisons	Sum square	degree of freedom	mean square	F	Significance level

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Time Factor	Pre-test - post-test	۱۳۰۰۹/۶۵	۱	۱۳۰۰۹/۶۵	۸/۱۸	۰/۰۰۷
	Post-test-follow-up	۴۶۴۸/۱۲	۱	۴۶۴۸/۱۲	۴/۹۴	۰/۰۳
	Pre-test-Follow-up	۶۶۰۴/۶	۱	۶۶۰۴/۶	۹/۲۵	۰/۰۴
Time* Group	Pre-test - post-test	۱۵۸۶۳/۴۷	۱	۱۵۸۶۳/۴۷	۹/۹۸	۰/۰۰۳
	Post-test-follow-up	۱۴۲۸/۱۲	۱	۱۴۲۸/۱۲	۱/۵۲	۰/۲۲
	Pre-test-Follow-up	۱۵۹۶/۴۹	۱	۱۵۹۶/۴۹	۷/۱۹	۰/۰۰۹
Error	Pre-test - post-test	۶۶۷۳۰/۵۳	23	20.3033	-	-
	Post-test-follow-up	۳۹۴۵۱/۷۶	23	29.1715	-	-
	Pre-test-Follow-up	۳۵۴۱۸/۴۴	23	93.1539	-	-

As can be seen from Table 8, there is a significant difference between the pre-test and post-test scores of the experimental group. This result shows that the simultaneous combination of mindfulness-based stress reduction methods and Transcranial Direct Current Stimulation (TDCS) is effective in reducing the stress intensity of migraine patients. The table also result shows that there is a difference between the post-test and follow-up scores of the experimental group, which means that the experimental group, who had high scores in the stress intensity interaction in the post-test, showed a sharp decline in scores in the follow-up stage. The teaching method has not been effective over time, and this shows that this educational method has not been effective over time.

Conclusion:

It seems that some migraine sufferers did not understand some of the questions related to the questionnaires, in which case the researcher would provide more explanation for the individuals. Migraine sufferers suffer from a variety of cognitive or behavioral problems, and they may have

referred to different people for treatment and rehabilitation to solve their problems, believe that their problem will not be solved. The researcher's experience shows that applying an objective formula away from abstract perspectives can improve the therapist's success rate in increasing the abilities of migraine sufferers.

Migraine sufferers, due to having tension headaches, at the beginning of treatment to get rid of various symptoms and physical problems and in order to recover sooner, it is better to hold various sessions to increase anger management, increase their quality of life and so on. Because the researcher's experiences during the treatment process showed that during the tests or the training and treatment process, several of these subjects experienced migraine and tension headaches at different times and this phenomenon may cause problems in the treatment process.

However, researchers believe that targeting stress intensity with mindfulness-based stress reduction training methods and combining mindfulness-based stress reduction and Transcranial Direct Current Stimulation (TDCS) for migraine sufferers cannot completely solve their main problem. It seems that reducing the problems of migraine sufferers requires special clinical attention.

The present study, focusing on mindfulness-based stress reduction training and combining mindfulness-based stress reduction and Transcranial Direct Current Stimulation (TDCS) in migraine sufferers, was able to observe significant results from the implementation of this new training method, including reducing the severity of stress. Only a few people may not have experienced a headache, the pain is the most common type of pain which includes all the inter-cranial structures as well as the extra-cranial structures. The most important issue in dealing with a headache is the distinction between malignancy and benign headache. Headaches that first appear with relatively high intensity are completely different from chronic or persistent periodic headaches. Benign headaches are so common that they can sometimes be considered a normal aspect of life. A subtle point that can be looked at in particular, regardless of the statistical structure of the present study and the perspective of the executor, is that the experience of this study showed that wherever people with migraines or other family members work better with the researcher to do homework, that is they had implemented the program more correctly and better during the week, the results of the researcher's comparisons with other participants showed the effect of family cooperation in the treatment process.

The results showed that mindfulness-based stress reduction training is effective in reducing stress intensity in migraine patients. Also, by simultaneously combining mindfulness-based stress reduction methods and Transcranial Direct Current Stimulation (TDCS), we achieved significant results in reducing the stress intensity of migraine patients, and research hypotheses were proved.

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References

1. Saffarinia M., Shahandeh M., Ali Akbari, M., Bagherian Sararoudi R.. The effect of psychosocial group therapy on the improvement of migraine attacks and quality of life in patients with migraine, Journal of Isfahan Medical School, 2014: 2410 -2401
2. Rice F.. Human Development: The Developmental Psychology from Birth to Death, translated by M, Foroughan, Tehran, Arjmand, 2008
3. McCracken L., Gross, R., Eccleston C.. Multimethod assessment of treatment process in chronic low back pain: Comparison of reported pain-related anxiety with directly measured physical capacity. Behavior Research and Therapy, 2002; 40; 5:585-594.
4. Hayes S.C., Strosahl, K.D. Wilson K.G.. Acceptance and Commitment Therapy. The Process and Practice of Mindful Change (Second Edition). New York, NY: Guilford Press, 2012
5. Williams K. A., Kolar M. M., Reger B. E., Pearson J.C.. Evaluation of a wellness-based mindfulness stress reduction intervention: a controlled trial. American Journal of Health Promotion, 2001
6. Liebetanz D., Nitsche MA., Tergau F.. Pharmacological approach to the mechanisms of transcranial DC-stimulation-induced after-effects of human motor cortex excitability. Brain 2002; 125: 2238–2247.
7. Mohammadi H.. Stress and internal pressures, Mashhad, Atrak, 1397.
8. Langer, E. Mindfulness. Cambridge, MA: Da Capo Press. 1989
9. Bögels SM., Lehtonen A., Restifo K.. Mindful Parenting in mental health care. Mindfulness, 2010;1:107–120
10. Burpee L.C., Langer E.J.. Mindfulness and Marital Satisfaction, J Adult Development, Vol. 2005, 12, 43–51