Comparison of the Effectiveness of Mindfulness-Based Stress Reduction Group Therapy With Acceptance and Commitment Therapy on Severity of Pain and Health-Related Quality of Life in Patients With Migraine

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Abstract

Background: Considering the prevalence of migraine and its detrimental effects on functioning, physical health, and quality of life as well as its psychosocial and social risks. The purpose of this study was to compare the effectiveness of mindfulness-based stress reduction treatment with treatment based on acceptance and commitment to the severity of pain and health-related quality of life in migraine patients.

Methods: In this study, a semi-experimental design used with pre-test, post-test, a 3-month follow-up, and a control group. Using purposive sampling and considering the inclusion criteria, 45 patients with migraine diagnosis selected from among those referring to the neurology department of Imam Hossein hospital in Tehran. They were then randomly assigned to two experimental groups and a control group. The first experimental group received group therapy based on mindfulness (n = 15; 90-minute sessions), the second experimental group received acceptance and commitment based intervention (n = 15; 90-minute sessions), and the control group (n = 15) received no intervention. All subjects responded to pain intensity and health-related quality of life questionnaires before the intervention (pre-test), after the intervention (post-test), and 3 months after the intervention (follow-up).

Results: The findings showed that mean scores for the 2 experimental groups were significantly different from the control group in the post-test and follow-up phases in terms of severity of pain and health-related quality of life, while the mean scores for the two experimental groups did not differ significantly. The results emphasize the importance of these interventions for chronic diseases and offer new horizons in clinical interventions.

Conclusion: The results of this study showed that mindfulness-based stress reduction therapy and acceptance and commitment therapy could positively affect the severity of pain and health-related quality of life in migraine patients, and any of them can be used to improve the variables mentioned above.

Keywords: Mindfulness-based therapy; Acceptance; Commitment, The severity of pain; Health-related quality of life; Migraine.

Introduction

Migraine is a debilitating headache and a neurovascular disorder described as the third common disorder and the seventh cause of disability in the world. This type of headache occurs periodically, usually lasting from 4 to 72 hours. The occurrence rate of migraine per year is 17% in women and 6% in men, and the highest prevalence is in the age group of 35 to 45 years old. Migraine headaches...
are usually associated with dizziness, nausea, and sensitivity to light and sound.\textsuperscript{3} This condition is highly hereditary, but factors such as stress, depression, sleep disorders, hormonal imbalance (menstruation), fatigue, and some foods can trigger migraines.\textsuperscript{4} This chronic and prolonged pain disrupts healthy life and negatively affects physical, psychological, and social health as well as the quality of life.\textsuperscript{5,7} Studies indicate that mental disorders (anxiety, depression, and lack of social support) are more common in people with migraine headaches. This leads to a decrease in quality of life and ultimately, mental disorders.\textsuperscript{5,8} Kollewe et al showed that health-related quality of life, as a multi-dimensional concept, can be considered as the most important goal in treating these patients, in order to reduce symptoms and improve their health and psychosocial functions.\textsuperscript{9} Findings by Shaik et al indicated that women with migraine experience lower levels of physical and psychological quality of life compared to healthy people. Therefore, the frequency and severity of pain are related to the quality of life in women with migraine, and the higher the number of days and the severity of the pain, the lower their quality of life.\textsuperscript{10}

The findings suggest that psychological treatments such as mindfulness or acceptance and commitment approaches can help patients with chronic pain. Mindfulness-based treatment is the deliberate and uncritical attention to the present moment which previously taken for granted.\textsuperscript{11} By practicing mindfulness techniques, people acquire greater awareness about their daily activities, becoming aware of the automatic functioning of their minds in the past and the future and gain more control over their minds by constant awareness about their thoughts, emotions, and physical states. In this way, they are set free from the automatic mind, which focused on the future or the past.\textsuperscript{12} Research findings show that mindfulness can be useful in reducing stress and improving the quality of life in patients with migraine.\textsuperscript{13} Zare et al concluded that mindfulness-based stress reduction therapy helps to improve mental health and reduce perceived pain.\textsuperscript{14} Also, many studies have confirmed the positive effects of mindfulness-based stress reduction therapy in chronic patients.\textsuperscript{15-18} Nathan et al\textsuperscript{19} investigated the effect of stress reduction through mindfulness on pain-related disorders, pain intensity, and health-related quality of life in diabetic patients. The results of this study showed positive effects of mindfulness on patients’ performance and their quality of life and reduction in pain catastrophizing and pain intensity. Bakhshani et al\textsuperscript{20} investigated the effect of mindfulness-based stress reduction on the severity of pain and quality of life in patients with chronic headache. Their findings showed significantly reduced pain perception and improved quality of life in the intervention group compared to the control group. They concluded that this treatment could use as a non-pharmacological intervention to improve the quality of life and develop pain-coping strategies in patients with chronic headache.

On the other hand, acceptance and commitment therapy is the only psychological and empirical intervention in which acceptance strategies combined with commitment and behavioral change strategies to increase psychological flexibility and committed action in order to achieve goals based on values.\textsuperscript{21} This theory considers avoidance of pain and stress as the main problem of patients leading to disability and reduced satisfaction in life. Therefore, the primary method of treatment in acceptance and commitment therapy is to expose patients to situations that previously avoided.\textsuperscript{22} This treatment works by increasing people’s ability to stay active and act following their values to improve the quality of life and their functioning.\textsuperscript{23} In this regard, Müller et al\textsuperscript{24} examined the effectiveness of acceptance and commitment-based treatment in migraine patients. According to their findings, this treatment leads to pain reduction and symptom relief by increasing psychological flexibility. A study by Dindo et al\textsuperscript{25} showed that acceptance and commitment therapy increases the acceptability of pain and reduces pain in patients. The findings reported by Bastami et al showed that acceptance and commitment intervention in patients with type 2 diabetes significantly increased the quality of life in the experimental group compared to the control group, after eight sessions of intervention, and lasted after 3 months in the follow-up phase.\textsuperscript{26}

What adds to the importance of this study is the application of relatively new psychological treatments that help improve patients’ quality of life and performance. However, application of this treatment requires further studies. To this end, the effectiveness of mindfulness-based therapy can compare with other treatments which have adequate research support - e.g., acceptance and commitment-based therapy. So far, this topic has not researched in Iran. Therefore, the purpose of this study is to compare the effectiveness of mindfulness-based stress reduction group therapy with acceptance and commitment-based therapy on the severity of pain and health-related quality of life in migraine patients.

**Methods**

This study was semi-experimental in design using pre-test, post-test, control group, and a follow-up period of 3 months. The target population included all migraine patients referred to the neurology department of Imam Hossein hospital in Tehran during the spring of 2018. The sampling process started by selecting 100 patients from the list provided by the hospital, and invitations sent to them via SMS. The screening was carried out on those willing to participate in the study, and 45 subjects selected through purposive sampling. They were then randomly assigned to 3 groups, 2 experimental groups (15 subjects for mindfulness therapy intervention, 15 subjects for acceptance and commitment treatment), and a control group (15 subjects receiving no intervention). The criteria for including subjects in the study were: (1) Diagnosis of...
migraine by neurologists or psychiatrists the absence of other acute or chronic disorders. (2) Not using psychiatric drugs during the study. (3) The minimum education level of a high school diploma. (4) No history of psychotherapy or drug treatment before participating in this research. (5) Minimum age of 20 years, not suffering from other physical illnesses or severe psychiatric disorders. (6) Absence of other disabling or chronic diseases such as kidney, liver, or cardiovascular diseases. (7) Being clean from drug abuse and the patient's willingness to participate in the research. The criteria for exclusion include the reluctance to cooperate in the treatment sessions, and absence in more than 2 sessions. Then, the subjects in experimental groups underwent the treatments mentioned above in 8 (90 minutes) weekly sessions for 2 months. The control group did not receive any treatments. Due to ethical considerations at the end of the research, the treatment also offered to the control group.

**McGill Pain Questionnaire**
The McGill Pain Questionnaire is the most reliable instrument for measuring pain (especially chronic and resistant pain). The most critical requirements of measurement instruments are accuracy, reliability, and validity, which are all fulfilled by the McGill pain questionnaire. In the present study, Cronbach's alpha coefficient for reliability was 0.73. This questionnaire allows the patients to express their perception of pain in sensory, affective, and evaluative dimensions. Another feature of the McGill Pain Questionnaire is its potential value in the diagnosis of differential pain. This questionnaire was used by Melzack (1973) on 297 patients suffering from various types of pain. Initially, specialists had reported 102 words that were commonly used by patients to express their pain. After numerous studies, McGill Pain Questionnaire has accepted as a reliable instrument for studying and evaluating pain through various clinical methods. The main part of this questionnaire consists of 20 sets of verbal descriptors related to the mental perception of pain.

**Quality of Life Questionnaire (SF-36)**
This questionnaire is designed by Ware et al. It is a comprehensive questionnaire for measuring the quality of life in all health-related aspects. The questionnaire examines eight dimensions for quality of life consisting of 36 items that can be completed by respondents or through interviews. It could use for different age groups and diseases. Reliability and validity of this questionnaire were approved by Ware et al in 1988. The questionnaire shows people's perceptions of their quality of life in 8 dimensions whose scores may vary from 0 to 100. The score of 100 represents the ideal conditions, and zero indicates the worst conditions for each dimension. These dimensions include physical functioning, role limitations due to physical health problems, bodily pain, vitality, general health, mental health, role limitations due to emotional problems, and social functioning. This questionnaire has international reliability and validity. In Iran, it has been translated by the Institute for Health Sciences of the Academic Center for Education, Culture, and Research. This institute has also verified the reliability and validity of the SF-36 questionnaire. Cronbach's alpha coefficient as a measure of its reliability has calculated between 77% and 95% for all dimensions except for vitality, whose reliability coefficient was 65%. Therefore, the reliability and validity of this questionnaire have approved for the Iranian population. In a study by Montazeri et al, internal consistency analysis showed that except for the vitality scale (Cronbach's alpha = 65%), other scales of the SF-36 questionnaire had the minimum reliability coefficients ranging from 77% to 90%. Also, the convergent validity test using the correlation of each item with the hypothesized scale yielded favorable results, and all the correlation coefficients exceeded the recommended value of 4%.

**Results**
Mean, standard deviation, frequency distribution table, and one-way analysis of variance (ANOVA) were employed to analyze the collected data using SPSS-21 software. The results have shown in Tables 1 and 2. In this study, 45 patients with migraine studied. The age of the participants ranged from 20 to 45 years old, and they assigned to 3 groups (15 subjects in the mindfulness-based intervention group, 15 subjects in the acceptance and commitment based intervention group, and 15 subjects in the control group).

Considering that the significance level of the Kolmogorov-Smirnov Z statistic for all of the research variables are higher than 0.05 in both measurement intervals and for all the groups, it could argue with a 95% certainty that all the research variables in this study have normal distributions. One-way ANOVA was used to examine the homogeneity of the 3 research groups (control/experimental) in pre-test scores. The results reported in Table 2.

**Statistical Results**
Considering that the observed F statistic values (for both research variables and their components) are smaller than the critical value of $F_{\text{0.05}}$ with 42 and 2 degrees of freedom (3.22), the null hypothesis of lack of difference between mean values of pre-test scores in the 3 research groups is confirmed.

**Discussion**
The results of this study regarding the positive effects of mindfulness-based stress reduction on the severity of pain and health-related quality of life in migraine patients indicated that the severity of pain and health-related quality of life in these patients were improved. The
Mindfulness-based stress reduction therapy has positive effects on migraine because this therapy emphasizes abandoning the internal struggle, self-acceptance without judgment, and enhancing awareness of the present moment. The techniques used in this type of therapy not only raise awareness and increase spirituality but also improve mental health and quality of life. Mindfulness-based stress reduction employs 2 essential techniques (observation and acceptance), which help in reducing depression, anxiety, and stress symptoms, worries, negative thoughts, and emotional distress. This treatment also improves well-being and self-esteem and leads to better physical health. Patients gain the ability to improve the quality of their lives by learning autonomy and flexibility in dealing with stressful events and acquiring mental and physical skills to change the challenge. Mindfulness training involves paying attention to the present moment and particular emotions such as physical sensations in the body; thus, the mind focuses on thoughts, emotions, voices, or other physical feelings and remembers the content of this awareness. As a result, attention gradually shifts back to the present from the past and future. This prevents thoughts from deviating from reality. Regular observation of thoughts makes it possible to see similar thought patterns merely as thoughts (not the reality itself). In the present study, mindfulness-based stress reduction techniques have reduced pain and improved quality of life in people with migraine.

In this study, investigating the effectiveness of acceptance and commitment-based therapy on the severity of pain and health-related quality of life in people with migraine, showed that this treatment has been effective in reducing the severity of pain and improving health-related quality of life. Although no similar research has previously done in the population of migraine patients, our results are consistent with other findings. Clinical studies emphasize the importance of acceptance-based strategies in reducing pain symptoms and increasing
Kamani et al. showed that acceptance and commitment-based therapy has significant effects on emotional, social, and physical functioning and leads to acceptance and reduction of pain in adolescents with chronic pain. According to their findings, this treatment also improves psychological flexibility and reduces depression symptoms in the parents.

Acceptance and commitment-based therapy work by active and productive confrontation with emotions, avoiding avoidance, changing attitudes toward oneself and challenges, reviewing values and goals of life, commitment to social goals, and psychological flexibility. Psychological flexibility is the main outcome of this treatment, which increases resilience and psychological well-being, and brings about a sense of calm and ultimately improves the quality of life. It could argue that acceptance is the main reason for the success of this treatment reducing the effect of painful experiences on emotional functions. Studies show that acceptance has 2 essential components. The first component is the experience of pain without trying to manage or avoid it. The second component is addressing life activities along with the experience of pain.

Patients who are more willing to experience thoughts, undesirable memories, and emotional experiences tend to function better socially, physically, and emotionally. By performing defusion exercises (not to confuse oneself with the thoughts and feelings caused by illness), people can act more independently and consciously in the real world, and set themselves free from concentration on their narratives. This helps in using more effective coping styles, reducing stress and anxiety, improving the quality of life, and reducing pain. It could argue that one of the most apparent advantages of this treatment is that, unlike

<table>
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<th>Component/Variable</th>
<th>Source of Variations</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Squares</th>
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<td>1.400</td>
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many other therapies, it does not impose any particular value or lifestyle on individuals, and clients decide about the required changes based on their values. Encouraging patients to identify their values and determine their goals, actions, obstacles, and ultimately by a commitment to them, people achieve their goals despite the problems. This leads to more satisfaction and improved quality of life.\(^4\)

The results of this study regarding the effectiveness of mindfulness-based stress reduction and acceptance and commitment-based therapy in migraine patients indicate that they are equally effective. The similarities between the 2 therapeutic approaches can justify similar therapeutic outcomes. Psychological flexibility, values and abilities, emphasis on mindfulness and presence at the moment, acceptance, freedom from dissatisfactions, and committed action are common concepts in mindfulness and acceptance and commitment-based therapies. They reduce the severity of pain and improve the quality of life in people with migraines. Finally, it should note that like any other study, this research has also been subject to some limitations, including convenience sampling and not investigating some intervening variables. Therefore, caution should take in generalizing the results. In future studies, it has suggested that the effectiveness of both treatments should investigate for other rare conditions in the field of health psychology.

**Conflict of Interest Disclosures**

The authors declare that they have no conflict of interests.

**Ethical Statement**

All ethical principles considered in this article. The participants were informed about the purpose of the research and its implementation stages and signed the informed consent. They also assured about the confidentiality of their information. Moreover, they were allowed to leave the study whenever they wish, and if desired, the results of the research would be available to them.

**Acknowledgments**

We would like to thank all the employees and members of the neurology clinic of Imam Hossein hospital who helped in this project, and without their cooperation, this study would not have been possible.

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