



Effectiveness of Mindfulness-Based Cognitive Therapy on Pain Catastrophizing and Job Satisfaction of Employees with Migraine Headaches

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Abstract

Background and Objective: Migraine headache (MH) is a common disorder that is observed with severe pains at different levels of disability that can affect a person's performance. In this context, this study aimed to examine the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on pain catastrophizing and job satisfaction of employees with MH.

Materials and Methods: This was a semi-experimental study with a pretest-posttest control group design. The study's statistical population included all employees with MH in Tehran in 2020. The study samples ($n=30$) included patients with headaches, who were chosen using the available sampling technique and randomly divided into two groups of experimental and control. The pain catastrophizing and job satisfaction questionnaires were employed to collect the required data. Eight 90-minute sessions of MBCT were held for the experimental group, whereas the control group received no intervention. Finally, a multivariate analysis of covariance was used to analyze the obtained data.

Results: The findings of the present study revealed that MBCT significantly reduced pain catastrophizing and increased job satisfaction among employees with MH ($P<0.01$).

Conclusions: In conclusion, MBCT could decrease the catastrophizing of pain and raise job satisfaction among employees. For this purpose, it is suggested to hold workshops and programs by psychologists and specialists for employees with MH.

Keywords: Catastrophizing pain, Job satisfaction, Migraine headache, Mindfulness-based cognitive therapy

Background

It is called chronic pain when the pain persists beyond the time required to heal the tissue and despite various measures to alleviate it [1]. Although acute pain is necessary for human survival, pain loses its adaptive value after becoming chronic and has extensive negative effects on the physical and psychological health, quality of life, and socio-economic status of the affected person, as well as his family and society [2]. Migraine headache (MH) is a common neurological disorder and is considered a vascular-based headache disorder characterized by severe, periodic, and intermittent pains, dizziness and sometimes nausea, sensitivity to light and sound, and varying degrees of weakness [3, 4].

One of the important concepts in many types of MH-related research is pain catastrophizing [5].

Patients who experience MH mostly use this ineffective coping strategy. Catastrophizing in these patients is an independent and significant predictor of pain intensity, and if used frequently in dealing with pain, it can predict depression and physical disability even after controlling pain intensity [6, 7]. Catastrophic thinking about pain can significantly predict the patient's disability, and catastrophizing responses of migraine sufferers predict functional damage independently of other psychological variables and MH characteristics [8]. Bund et al. [9] investigated pain catastrophizing in MH patients in a study, the results of which showed that patients who had more depression and anxiety suffered from high pain catastrophizing. Based on the results of a study performed by Drahozal et al. [10], anxiety sensitivity and pain catastrophizing caused the

exacerbation of symptoms in patients with MH. Among the aspects of one's life that can be affected by MH are his/her performance and job satisfaction [11]. Job satisfaction is measured by the level of positive feelings and attitudes that people have toward their jobs. From an organizational point of view, a high level of job satisfaction is indicative of a very favorable organizational climate resulting in the attraction and survival of employees [12]. Work-related psychological injuries are among the biggest occupational health problems in industrialized and developing countries [13]. Roganti et al. [14] investigated anxiety, depression, and job satisfaction among patients with MH. The obtained results indicated low job satisfaction in patients with MH; moreover, people with high levels of anxiety and depression had less job satisfaction. According to the results of a study carried out by Berardelli et al. [15], patients with MH had low job satisfaction, which increased their feeling of helplessness.

Many patients with MH, despite undergoing drug interventions, still experience pain, and if they do not adapt to their headaches, their quality of life is visibly affected, and their endurance in the face of headaches decreases [16]. Therefore, the theoretical advances and the growth of research have provided the necessary foundations for the conceptualization of headaches as a psycho-physiological disorder [17]. Moreover, considering the frequent psychological problems of patients with a headache, the use of effective psychotherapies, along with drug treatments, can have a significant contribution to the healing of these patients' problems [18]. Several psychological treatments have been designed for patients with headaches; however, most of these pieces of research have focused on a limited number of aspects of this disease, such as personality, and social or psychological problems, and have ignored other aspects of this disease [19, 20].

Mindfulness-Based Cognitive Therapy (MBCT) was developed to prevent the recurrence of depression; however, currently, it has become one of the most widely used treatments in the field of psychotherapy and counseling [21]. By practicing this treatment, patients learn how to become aware of their emotions, thoughts, and physical feelings, as well as showing an adaptive response to the warning signs of disease recurrence indirectly by reducing the level of stress [22]. The basic principles of this treatment include being present in the present and not judging [23]. In research using mindfulness, there is an emphasis on the interaction between physical, emotional, and cognitive processes [24]. The research results indicate that this treatment is effective in pain catastrophizing [10] and job

satisfaction [15] in patients with MH. In this regard, the current study was conducted to examine the effectiveness of MBCT on pain catastrophizing and job satisfaction among employees with MH.

Objectives

Migraine headache (MH) is a common disorder that is observed with severe pains at different levels of disability that can affect a person's performance. In this context, this study aimed to examine the effectiveness of Mindfulness-Based Cognitive Therapy (MBCT) on pain catastrophizing and job satisfaction of employees with MH.

Materials and Methods

This was a semi-experimental study with a pretest-posttest control group design. The statistical population of the current study involved all employees suffering from MH in Tehran, Iran, in 2020, who had visited brain and nerve clinics in Tehran at the time of sampling. After obtaining the consent of the officials of the clinics and the patients, 30 patients were selected from the patients diagnosed with chronic headaches by a psychiatrist or brain and nerve specialist, and they were randomly assigned into two groups of experimental and control ($n=15$ each) [25]. The criteria for entering the study included being an employee, being in the age range of 25-50 years, being married, having the ability to read and write, not suffering from any serious illness other than chronic headache, not using psychiatric drugs, and consuming single-sided headache drugs for up to 1 period. On the other hand, the exclusion criteria were failure to answer the questions, worsening of the patient's headache, and absence of more than 2 sessions in therapy sessions.

Pain Catastrophizing Scale

The 13-item Pain Catastrophizing Scale, designed by Sullivan et al. [26], evaluates different dimensions of catastrophizing pain and helps to better understand the mechanism of its effect on pain experience. The responses to this scale are scored on a 5-point Likert scale. Factor analysis has shown that catastrophizing includes the subscales of rumination, magnification, and helplessness [26]. Participants are asked to choose a number from 0=never to 4=always to describe the frequency of 13 different feelings and thoughts related to the pain experience. According to Mohammadi et al. [27], the reliability of the subscales of rumination, magnification, and helplessness were 0.65, 0.53, and 0.81, respectively, and Cronbach's alpha coefficient for the whole scale was obtained at 0.84. In the present study, Cronbach's alpha coefficient for the

total score was 0.85, and those for the subscales of rumination, magnification, and helplessness were estimated at 0.81, 0.79, and 0.86, respectively.

Spector Job Satisfaction Questionnaire

Spector Job Satisfaction Questionnaire, developed in 1985, is a suitable tool for measuring job satisfaction among employees [28]. This questionnaire consists of 36 self-report items and is scored on a 6-point Likert scale (from 1=completely agree to 6=completely disagree). In total, the questionnaire has 9 dimensions, each one being measured by 4 items. Akbaratabar et al. [29] evaluated the reliability of the total score of this questionnaire using Cronbach's alpha coefficient ($\alpha=0.67$). In the present research, Cronbach's alpha coefficient for the total scale was calculated at 0.81,

and the reliability scores of the dimensions of pay, promotion, supervision, fringe benefits, contingent rewards, operating procedures, coworkers, nature of work, and communication were obtained at 0.75, 0.81, 0.84, 0.79, 0.72, 0.83, 0.80, 0.86, and 0.78, respectively.

Mindfulness-Based Cognitive Therapy

Before the start of the intervention, the questionnaires were administered among all the patients as a self-report (pre-test); afterward, the members of the experimental group received MBCT as a group during 8 sessions of 90 minutes (2 months, one session per week) [30]. During the study period, the members of the experimental and control groups received their routine treatment for their headaches.

Table 1. Content of sessions and protocol of Mindfulness-Based Cognitive Therapy [30]

Session	Target	Topic
1	Becoming more aware of emotions and thoughts, having bodily sensations from moment to moment, and experiencing being in the moment.	Explaining the importance of being in the moment here and now, opening the concept of mindfulness for members using several techniques, and learning to do everyday affairs, along with paying attention to them.
2	Paying attention to feelings and thoughts, and expanding and accepting unpleasant thoughts and feelings.	Getting to know the wandering mind and practicing what to do, experiencing physical sensations, and paying attention to breathing.
3	Learning response skills to unpleasant thoughts or feelings.	Calming the wandering mind by practicing breathing and examining the body, sitting meditation, and performing exercises that bring attention to the moment.
4	Preventing the establishment of negative thoughts.	Learning to stay in the present moment without running away from people and watching the turmoil of thoughts.
5	Changing old habits of thinking.	Being fully aware of thoughts and feelings and accepting them without judgment or direct interference.
6	Being aware of the warning signs of resilience and psychological well-being.	Changing mood and thoughts through the indoctrination of thoughts as just thoughts and not reality.
7-8	Becoming aware of minor mood changes.	Being aware of the signs of decreased resilience and psychological well-being, setting up a plan to deal with possible signs of decreased resilience and psychological well-being; Planning for the future and using the techniques of being present at the moment to continue living and generalizing them to the whole flow of life.

Results

Table 2 presents the mean and standard deviation of pretest-posttest scores of catastrophizing pain and job satisfaction of employees with MH in both groups. It also reports the results of the Shapiro-Wilk test used to determine whether variables in the two groups were normally distributed. According to this table, Shapiro-Wilk statistics were non-significant for all variables, indicating that the variables were distributed normally (Table 2).

Levene's test was used to determine whether dependent variables had a homogeneous variance in groups, the results of which revealed that the variance of catastrophizing pain ($F=1.44$, $P=0.240$) and job satisfaction ($F=1.27$, $P=0.268$) were equal in both groups. Box's M test was

employed to check whether the covariance matrix of dependent variables was equal between the experimental and control groups; according to the results of this test, the covariance matrix of the dependent variables was equal (Box's $M=107.59$, $F=0.73$, $P=0.967$).

Box's M test suggests that this assumption is valid since its significance is greater than 0.05. Additionally, the findings of the Chi-square-Bartlett test, which was used to investigate the sphericity or significance of the relationship between catastrophizing pain and job satisfaction, indicated that this relationship was significant ($\chi^2=98.84$, $df=77$, $P<0.01$). Followingly, a multivariate analysis of covariance was performed to find out the differences between the groups (Table 3).

Table 2. Descriptive Indices of Study's Variables in Experimental and Control Groups

Variables		Groups	Mean	SD	Shapiro-Wilk test	P-value
Rumination	Pre-test	Experimental	19.60	1.59	0.091	0.052
		Control	19.26	2.52	0.074	0.096
	Post-test	Experimental	18.06	1.47	0.105	0.094
		Control	19.40	1.96	0.069	0.063
Magnification	Pre-test	Experimental	17.40	2.85	0.114	0.051
		Control	17.26	1.51	0.058	0.055
	Post-test	Experimental	16.06	2.74	0.096	0.057
		Control	17.05	3.05	0.118	0.061
Helplessness	Pre-test	Experimental	17.66	1.97	0.077	0.091
		Control	17.34	1.52	0.063	0.051
	Post-test	Experimental	16.00	2.14	0.107	0.067
		Control	17.20	2.31	0.051	0.081
Pay	Pre-test	Experimental	13.14	1.40	0.069	0.060
		Control	13.20	2.67	0.132	0.071
	Post-test	Experimental	4.15	1.38	0.053	0.056
		Control	13.30	2.90	0.094	0.057
Promotion	Pre-test	Experimental	17.01	1.69	0.053	0.106
		Control	17.20	3.41	0.104	0.068
	Post-test	Experimental	18.40	1.72	0.114	0.075
		Control	17.33	1.68	0.096	0.091
Supervision	Pre-test	Experimental	14.80	2.49	0.052	0.058
		Control	14.66	1.06	0.103	0.074
	Post-test	Experimental	16.13	2.51	0.084	0.065
		Control	14.86	1.96	0.064	0.087
Fringe benefits	Pre-test	Experimental	15.53	1.44	0.058	0.051
		Control	15.420	2.63	0.126	0.084
	Post-test	Experimental	17.06	1.74	0.095	0.094
		Control	15.60	2.34	0.091	0.052
Contingent rewards	Pre-test	Experimental	13.93	2.79	0.076	0.104
		Control	13.73	1.40	0.105	0.067
	Post-test	Experimental	14.86	1.90	0.058	0.050
		Control	13.91	2.08	0.097	0.064
Operating procedures	Pre-test	Experimental	16.13	3.39	0.116	0.068
		Control	16.01	1.73	0.087	0.071
	Post-test	Experimental	15.05	2.16	0.109	0.094
		Control	16.37	2.97	0.085	0.075
Coworkers	Pre-test	Experimental	16.73	2.60	0.055	0.053
		Control	16.53	1.26	0.101	0.051
	Post-test	Experimental	15.42	2.46	0.059	0.074
		Control	16.53	1.82	0.071	0.067
Nature of work	Pre-test	Experimental	15.53	2.69	0.110	0.060
		Control	15.33	1.53	0.060	0.097
	Post-test	Experimental	16.46	2.89	0.079	0.052
		Control	15.07	2.01	0.081	0.058
Communication	Pre-test	Experimental	13.60	1.79	0.064	0.067
		Control	13.40	2.38	0.073	0.095
	Post-test	Experimental	15.26	1.63	0.113	0.093
		Control	13.66	2.17	0.092	0.054

According to the calculated effect size, the independent variable accounted for 71% of the total variance in the experiment and control groups. However, a univariate analysis of the covariance test was used in the MANCOVA test to determine in which areas the difference was significant, the results of which are reported in Table 4.

According to Table 4, F-statistic is significant for

r Rumination (53.86), magnification (17.29), helplessness (33.84), pay (14.15), promotion (16.12), supervision (27.09), fringe benefits (24.15), contingent rewards (17.94), operating procedures (16.12), coworkers (37.16), nature of work (28.92), and communication (23.06) at the level of 0.001. Based on these findings, significant differences existed between the groups regarding these variables.

Table 3. Results of Multivariate Analysis of Covariance on Mean Post-Test Scores

Test	Value	F	df	df error	P-value	Effect value
Pillai's Trace	0.716	11.762	12	5	0.001	0.71
Wilks' Lambda	0.385	11.762	12	5	0.001	0.71
Hotelling's Trace	2.341	11.762	12	5	0.001	0.71
Roy's Largest Root	2.341	11.762	12	5	0.001	0.71

Table 4. Results of Univariate Analysis of Covariance on the Mean of Post-Test Scores of Dependent Variables in the Control and Experimental Groups

Variables	SS	SS error	df	MS	MS error	F	P-value	Effect value
Rumination	16.411	4.87	1	16.411	0.30	53.86	0.001	0.77
Magnification	5.942	5.49	1	5.942	0.34	17.29	0.001	0.52
Helplessness	15.388	7.27	1	15.388	0.45	33.84	0.001	0.68
Pay	3.535	3.99	1	3.535	0.25	14.15	0.001	0.47
Promotion	7.338	7.28	1	7.338	0.45	16.12	0.001	0.50
Supervision	8.306	4.90	1	8.306	0.30	27.09	0.001	0.62
Fringe benefits	13.639	9.03	1	13.639	0.56	24.15	0.001	0.60
Contingent rewards	3.609	3.21	1	3.609	0.20	17.94	0.001	0.53
Operating procedures	5.409	5.36	1	5.409	0.33	16.12	0.001	0.50
Coworkers	4.748	2.04	1	4.748	0.12	37.16	0.001	0.69
Nature of work	12.047	6.67	1	12.047	0.41	28.92	0.001	0.64
Communication	13.956	9.68	1	13.956	0.60	23.06	0.001	0.59

Discussion

This study was conducted with the aim of investigating the effectiveness of MBCT on pain catastrophizing and job satisfaction among employees with MH. According to the results, MBCT could decrease pain catastrophizing and increase job satisfaction among employees with MH. These results are in agreement with those of earlier studies [9-15].

In explaining these findings, it can be acknowledged that mindfulness helps patients to understand how to rediscover peace and contentment from the depths of their being and integrate it into their daily life and lifestyle; it helps them to save themselves from worry, anxiety, fatigue, and depression [31]. This approach believes that if anyone is involved in periods of suffering and pain, this pain and suffering, with the awareness of the mind, turns into empathic suffering that leads to feelings of compassion for oneself and others, and consequently, greater resilience when facing it. Without awareness, pains and suffering are experienced as debilitating emotion that is mixed with discomfort and anger and is accompanied by a feeling of extreme helplessness [32].

In other words, MBCT helps patients to learn how to become conscious of their emotions, feelings, and physical thoughts, and indirectly by reducing the level of stress, makes individuals give an adaptive response to the symptoms of relapse [22]. Performing mindfulness exercises leads to the development of various factors, including observation, non-judgment, non-reactivity, and action with awareness, and finally, the growth of psychological well-being, a reduction in stress, and a decrease in psychological symptoms [21]. An increase in awareness leads to an improvement in the ability to step back and observe situations, such as anxiety; as a result, a person can break free from self-controlling behaviors, and through understanding and re-acceptance, he will be no longer under the control of states, such as fear and anxiety, rather he can utilize the information gathered from these

states, and involve his emotions, to improve his job satisfaction [34]. The reason is that mindfulness is a non-judgmental and balanced way of observing and accepting emotions and physical phenomena as they happen [22]. Therefore, teaching it to patients with MH causes them to accept their feelings and physical symptoms, including headaches, and the acceptance of these feelings causes a decrease in attention and excessive sensitivity in patients [35].

Effective cognitive mechanisms, such as exposure, cognitive change, self-management, relaxation, and acceptance, help reduce the intensity of the pain [24]. In other words, people learn a skill that would help them to be aware of their physical state, feelings, and thoughts at any moment, as well as identifying defective physical and mental states instead of retreating and controlling during the exercises. The person accepts them, keeps them in time, and puts them aside, that is, instead of denying them, he accepts their existence, and his acceptance lowers the negative burden of this state and prevents the progress of symptoms [36]. Using mindfulness techniques causes changes in the thinking patterns of a person. For example, using the technique of observing thoughts related to pain without judging can lead to understanding that these experiences are only thoughts and do not represent the truth or reality [23].

In this research, the required data were collected using questionnaires, which, due to their self-reporting nature, there was a possibility of bias in the responses. Due to the limitation of the statistical community of this research, it is suggested that the current research be carried out among different statistical communities in other cities as well. Moreover, in addition to a questionnaire survey, other methods of collecting information, such as observation and interviews, should also be used.

Conclusions

Based on the results of the current study, MBCT, with the use of its processes and techniques, was shown to increase job satisfaction and reduce

catastrophizing in the pain group. Considering the important role of employees in the family and society, and on the other hand, the necessity of paying attention to their psychological and physical health, it is suggested that in headache associations, psychological clinics of government hospitals and clinics, individual and group MBCT be used in the field of increasing job satisfaction and reducing the catastrophic pain of employees with MH.

Compliance with ethical guidelines

The current study was approved by the Ethics Committee of Baqiyatallah University of Medical Sciences Tehran, Iran (Code: IR.BMSU.REC.1398.276).

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Authors' contributions

Conceptualization of the project: F, B-S & A, F-A; Methodology: F, B-S, V, S-N. & Z, B; Writing the original draft: F, B-S & N, M; Review and editing: F, B-S & A, F-A.

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Conflicts of Interest

The authors declare that there is no conflict of interest.

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