



Effectiveness of Mindfulness-Based Cognitive Therapy on Illness Acceptance and Quality of Life in Patients with Spinal Cord Injury

ARTICLE INFO

Article Type Original Study

Authors

Ashraf Bagheri¹, PhD Candidate
Alireza Heidari^{2*}, PhD
Farah Naderi², PhD

How to cite this article

Bagheri A, Heidari A, Naderi F, Effectiveness of Mindfulness-Based Cognitive Therapy on Illness Acceptance and Quality of Life in Patients with Spinal Cord Injury. Int. J. Musculoskelet. Pain. Prev. 2024; 9(3): 1057-1064.

¹ Department of Health Psychology, Khorramshahr International Branch, Islamic Azad University, Khorramshahr, Iran.

² Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran.

doi: [10.22034/IJMPP.9.3.1057](https://doi.org/10.22034/IJMPP.9.3.1057)

* Correspondence

Correspondence Address:
Department of Psychology, Ahvaz Branch, Islamic Azad University, Ahvaz, Iran.
P.O. Box: 68875 61349
Tel: 0098 61 33348320
Fax: 0098 33329200
E-mail: heidaria945@gmail.com

Article History

Received: May 17, 2024
Accepted: Jun 26, 2024
ePublished: Jul 12, 2024

ABSTRACT

Aims: Spinal Cord Injury (SCI) can significantly impact a patient's Quality of Life (QoL) and lead to challenges in accepting their illness. Mindfulness-Based Cognitive Therapy (MBCT) has shown promise in improving psychological well-being in various populations. This study aimed to investigate the effectiveness of MBCT on illness acceptance and QoL in patients with SCI.

Method and Materials

A quasi-experimental pre-test post-test with a control group design was employed. The study population consisted of all female and male patients with SCI in Ahvaz City in 2023. Thirty patients with SCI (15 patients per group) from Ahvaz City, Iran, were recruited in 2023 through convenient sampling. Participants completed the Illness Acceptance and Quality of Life questionnaires at pre-test and post-test. The experimental group received eight 90-minute MBCT sessions. Analysis of covariance (ANCOVA) was used to analyze the data.

Findings: Significant differences were found between the experimental and control groups in illness acceptance and QoL scores at post-test ($P < 0.01$). The MBCT intervention led to improvements in both aspects for the experimental group.

Conclusion: This study suggests that MBCT can be an effective intervention for improving illness acceptance and QoL in patients with SCI. Further research with larger samples and longer follow-up periods is warranted.

Keywords: Mindfulness, Quality of life (QoL), Illness Acceptance, Spinal Cord Injuries (SCI)

Introduction

Spinal Cord Injuries (SCIs) are among the most devastating physical traumas, causing disruptions in various bodily systems and potentially threatening life [1]. An individual with an SCI is defined as a person who, due to various causes such as trauma, brain tumors or cancer, cerebrovascular diseases, or even advanced stages of discopathy lesions, experiences damage to their spinal cord from below the bulbous medullae to the cauda equina nerve plexus region which protected by the vertebral column [2]. The extent of the lesion can range from partial to complete, including crushing and morphological alterations, leading to motor, sensory, or autonomic impairments in one or more limbs and the trunk [3]. Individuals with SCIs are classified as severely disabled and experience multiple

disabilities due to nerve damage from sports accidents, motor vehicle collisions, or traumatic workplace injuries [4]. If the injury occurs at the level of the thoracic vertebrae and below, the individual experiences paraplegia, which is paralysis of the lower limbs. If it occurs in the cervical spinal cord region, it leads to quadriplegia or tetraplegia, which is paralysis of all four limbs. The closer the site of the lesion is to the brain, the greater the level and severity of the SCI [5]. Overall, SCI is a devastating condition that, depending on its extent and severity, can cause significant changes in an individual's health and lifestyle [6].

The current situation can lead to social withdrawal and non-acceptance of illness among patients with SCI [7]. Illness acceptance is a process that patients with SCI must undergo

to adapt to their new condition and altered abilities. It can be described as viewing oneself as capable in a different way rather than disabled [8]. Illness acceptance involves a shift in an individual's values, placing less emphasis on physical abilities and more on the things that have remained unchanged after a major life change [9]. Studies have shown that acceptance is a key factor in the recovery process for patients with SCI as it is associated with aspects of adjustment, adaptation, and self-esteem [10]. Coping with disability is a dynamic general process through which patients with SCI gradually move towards a more favorable and consistent state with their surrounding environment [11].

Following an SCI, individuals typically experience significant life changes that require time and support from others to adapt to and adjust their daily activities to this new reality [12]. In the aftermath of this major life change, many SCI survivors experience conditions such as altered self-concept, loneliness, depression, and anxiety, and their Quality of Life (QoL) is often compromised [13]. Quality of life in patients with SCI can be associated with their level of death anxiety [14, 15]. In general, QoL refers to an individual's subjective perception of their position in life, their culture, and value system, and is closely linked to their personal goals, aspirations, and values [16]. Quality of life encompasses factors such as physical health, psychological well-being, level of independence, social relationships, personal beliefs, and the interplay of these factors with the environmental aspects of an individual's life [17, 18].

In light of the high prevalence of mental health disorders among patients with SCI, group therapy can be utilized to address their challenges [12]. Mindfulness-Based Cognitive Therapy (MBCT) emerges as a promising treatment approach in this context. This was introduced by Segal et al. [19] as a novel intervention for preventing relapse in depression. However, research has demonstrated its efficacy in reducing

psychological distress and stress associated with physical symptoms in cancer patients and other chronic illnesses [20-22]. MBCT Mindfulness-Based Cognitive Therapy rests on three core principles: non-judgmental awareness, enhanced present-moment awareness, and acceptance. It facilitates individuals in processing their cognitive, physiological, and behavioral experiences [23]. Mindfulness-Based Cognitive Therapy has demonstrated remarkable adaptability and effectiveness in primary healthcare settings and similar contexts, yielding optimal outcomes for patients experiencing stress, anxiety, and depressive symptoms [24]. Previous research has demonstrated the effectiveness of MBCT in improving the QoL in patients with multiple sclerosis, increasing medication adherence in diabetic patients, and reducing depression, anxiety, stress, and improving the QoL in older men [25-27].

This study investigates the potential benefits of MBCT for patients with SCI. The necessity arises from the challenges patients with SCI face in adapting to their condition, which can lead to difficulties in accepting their illness and a decline in QoL. The objectives of the study were twofold: firstly, to determine whether MBCT can improve illness acceptance in patients with SCI, and secondly, to assess its impact on their overall QoL. By examining these factors, the research aims to evaluate the potential of MBCT as an intervention to support the well-being of individuals living with spinal cord injuries.

Method and Materials

The present study was a quasi-experimental pre-test and post-test design with a control group. The statistical population included all female and male patients with SCI in Ahvaz, Iran, in 2023. A sample of 30 participants (15 patients per group) was selected using a convenience sampling method from patients with SCI referred to the Orkideh Rehabilitation Center in Ahvaz, a southern city in Iran, considering the inclusion criteria. Inclusion criteria were informed consent to participate in the study, having a minimum

literacy level to understand the questionnaire items, scoring below the mean on the QoL and illness acceptance questionnaires, and not taking concomitant medication for another disorder. Exclusion criteria included dissatisfaction with continued participation in the study and missing more than two treatment sessions. Additionally, after pre-testing all participants, the intervention was implemented for the experimental group, while the control group received no intervention and was placed on a waitlist. After completing the intervention, a post-test was administered to all participants in both groups. To address ethical considerations, the intervention was delivered in a condensed form to the control group after the completion of the study. Data analysis was conducted using analysis of covariance (ANCOVA) in the statistical software package SPSS-27. Data were collected using the following instruments:

The Chronic Illness Acceptance Questionnaire (CIAQ): The CIAQ was used to assess illness acceptance. This 20-item questionnaire, developed by Beacham et al. [28], measures two subscales: Engagement in Activity and Function in the Context of Illness and Willingness and Commitment to Persisting with Illness. Respondents rate their responses on a 7-point Likert scale (0 = not at all to 6=always). Items in the Willingness and Commitment to Persisting with Illness subscale are reverse-scored. Scores from the two subscales are then summed to obtain a total score, which ranges from 0 to 120. Higher scores indicate greater illness acceptance. In this study, the Cronbach's alpha was 0.81.

The World Health Organization Quality of Life Instrument - Short Form (WHOQOL-BREF): The WHOQOL-BREF was employed to assess participants' QoL. This widely used 26-item questionnaire evaluates health across four domains: physical, psychological, social relationships, and the physical environment. Scores on the WHOQOL-BREF reflect an individual's overall well-being and public health status. This questionnaire, developed by the World Health Organization (WHO) in 1989, the WHOQOL-BREF, represents a

refined version of a 100-item questionnaire. Each item is rated on a 5-point Likert scale ranging from "never" (1) to "very often" (5). It is important to note that items 3, 4, and 26 are reverse-scored. The total score on the WHOQOL-BREF can range from 26 to 130, with higher scores indicating better QoL [29]. In this study, the internal consistency of the WHOQOL-BREF was established with a Cronbach's alpha coefficient of 0.89. The intervention was applied as follows:

Mindfulness-Based Cognitive Therapy (MBCT): The experimental group received eight weekly 90-minute sessions of MBCT based on the training protocol developed by Crane [30]. A summary of the MBCT sessions is presented in Table 1.

Table 1) Summary of mindfulness-based cognitive therapy sessions

Sessions	Content
1	Introducing mindfulness, its benefits, and key concepts. Participants practice mindful raisin eating and body scan meditation to cultivate present-moment awareness.
2	Focuses on overcoming obstacles to mindfulness. Participants learn to observe thoughts and emotions non-judgmentally and refine their breath focus through exercises and meditation.
3	Participants refine breath focus, identify positive daily experiences, and explore mindful movement through exercises and meditations that combine gentle body movements with mindfulness.
4	Explores both pleasant and unpleasant experiences without judgment. Participants practice mindfulness through seeing, hearing, walking, and a combined body scan with movement exercise.
5	Combining body scan meditation with gentle movements introduces loving-kindness meditation to cultivate positive thoughts and feelings.
6	The session focuses on refining mindfulness skills. Participants practice focusing on the present moment through mindful sitting meditation and mindful breathing. Additionally, they learn to pay attention to bodily sensations and their surroundings while walking mindfully.
7	Introduces self-compassion meditation to cultivate kindness towards oneself and practices gratitude meditation to appreciate positive aspects of life.
8	Reviews mindfulness concepts and practices, discusses applying mindfulness to daily life, and encourages mindful decision-making. A post-test assesses mindfulness skills and outcomes.

Findings

The studied participants were predominantly

male (n = 19, 63.3%), with an average age of 37.54 years (SD = 4.02). The remaining participants were female (n = 11, 36.7%), with an average age of 32.70 years (SD = 3.61). Table 2 presents the means, standard deviations (SD), and Kolmogorov-Smirnov normality tests for the variables "illness acceptance" and "QoL." As observed in Table 2, the means of the study variables for the experimental groups exhibited changes between pre-test and post-

test measurements, while no significant changes were observed in the control group. Before analyzing covariance (ANCOVA), the assumptions of the test were carefully examined. The normality of data distribution was ensured by checking for the absence of influential outliers using the Kolmogorov-Smirnov normality test (Table 2). This confirmed that the assumption of normality was met for conducting ANCOVA.

Table 2) Means, standard deviations (SD), and Kolmogorov-Smirnov tests for illness acceptance and quality of life variables

Variables	Groups	Pre-test	Post-test	Kolmogorov-Smirnov	
		Mean ± SD	Mean ± SD	Z	P
Illness acceptance	Experimental group	57.01 ± 4.73	85.80 ± 12.73	0.22	0.057
	Control group	59.80 ± 4.31	60.04 ± 4.66	0.17	0.200
Quality of life	Experimental group	40.73 ± 8.02	74.27 ± 16.98	0.20	0.119
	Control group	39.07 ± 4.07	40.47 ± 5.78	0.16	0.200

The homogeneity of variances assumption, which requires equal variances between the experimental and control groups, was assessed using Levene's test. The results indicated that the variances were homogeneous for both the illness acceptance variable (F = 3.98, P = 0.056) and the QoL variable (F = 3.41, P = 0.254). The

homogeneity of regression slopes assumption, which requires parallel regression lines for the experimental and control groups, was examined using the test of parallelism. The results indicated that the regression slopes were homogeneous for both the illness acceptance variable (F = 0.33, P = 0.724) and the QoL variable (F = 3.25, P = 0.056).

Table 3) ANCOVA results for post-test illness acceptance and quality of life scores

Variables	SS	df	MS	F	P	η²
Illness acceptance	8072.04	1	8072.04	47.67	0.001	0.65
Quality of life	4971.43	1	4971.43	53.85	0.001	0.67

ANCOVA: Analyze Co-Variance

Based on the fulfillment of the assumptions, ANCOVA was deemed appropriate for the analysis. To compare the experimental and control groups on post-test scores while controlling for the effect of pre-test scores, ANCOVA was used to determine the impact of mindfulness-based cognitive therapy intervention on illness acceptance and QoL in patients with SCI. The post-test results are presented in Table 3. The results of the ANCOVA analysis examining illness acceptance and QoL are presented in Table 3. Post-hoc comparisons revealed a significant improvement in illness acceptance scores

following the intervention, after controlling for pre-test scores (η² = 0.65, F = 47.67, P< 0.001). This indicates a substantial positive effect of MBCT on illness acceptance among patients with SCI. Similarly, the ANCOVA analysis for QoL demonstrated a significant difference in post-test scores compared to pre-test scores, while accounting for pre-test scores (η² = 0.67, F = 53.85, P< 0.001). This finding suggests that the MBCT intervention effectively improved the QoL of participants.

Discussion

The primary objective of this study was to investigate the effectiveness of MBCT in enhancing illness acceptance and QoL among patients with SCI. The study findings demonstrated the effectiveness of MBCT in improving both illness acceptance and QoL in patients. SCIMBCT intervention led to a significant improvement in illness acceptance scores, as evident in the post-test assessment. This finding aligns with the results of a previous study by Bulbuloglu et al. [31]. The positive impact of MBCT on illness acceptance can be attributed to the core principles of mindfulness, which emphasize acceptance of the present moment, non-judgmental awareness, and self-compassion. These principles enable individuals to cultivate a more accepting attitude towards their illness, reducing the negative emotional impact and facilitating adaptation to the challenges of living with SCI.

Acceptance of illness is a cognitive process that involves assigning positive meaning to the illness experience and regaining a sense of personal control over one's life. This allows individuals to integrate their illness into their lifestyle without compromising their overall well-being [32]. A crucial factor influencing the development of acceptance is the duration of the illness. Patients newly diagnosed with a chronic condition often exhibit less willingness to tolerate illness symptoms compared to those with longer durations of illness. This stems from the significant life change brought about by the diagnosis, leaving them with limited time to adapt. Initially, these patients may avoid engaging with illness symptoms due to the novelty and painfulness of the experience. However, over time and with repeated exposure, they gradually become accustomed to the symptoms [31].

The effectiveness of MBCT in enhancing illness acceptance can be attributed to its emphasis on "exposure," a core mechanism of mindfulness. Exposure training, incorporated into meditation practices, teaches patients to confront their discomfort and pain without attempting to escape or avoid it. By observing and accepting these sensations without judgment, patients learn to tolerate them and

continue with their activities. This training translates into everyday life, empowering individuals to manage their illness and its consequences while maintaining their daily routines [33].

The study findings further demonstrated the efficacy of MBCT in enhancing the QoL among patients with SCI. This finding aligns with the results of a previous study by Camino et al. [27]. The positive impact of MBCT on QoL can be attributed to its core principles of mindfulness, which emphasize living in the present moment and non-judgmental awareness. This approach facilitates the cultivation of positive experiences, fostering a sense of empowerment and reducing feelings of helplessness and hopelessness in the face of life's challenges and illness-related issues. Mindfulness training also promotes stress reduction, further contributing to an improved QoL [27].

MBCT empowers patients with SCI to cultivate a fresh perspective on their thoughts, feelings, and behaviors. By encouraging mindful attention to the present moment, MBCT promotes non-judgmental acceptance of life events and challenges. This shift in perspective fosters a sense of detachment from negative emotions and encourages patients to observe their experiences without the burden of judgment. One potential explanation for the positive impact of mindfulness on QoL lies in its ability to activate brain regions associated with positive emotions [34]. This activation can enhance self-protective mechanisms, contributing to improved psychological well-being.

MBCT also plays a crucial role in addressing stress and emotional disturbances. By strengthening positive reappraisal skills and emotional regulation techniques, mindfulness can effectively reduce stress levels and alleviate mood disorders [35]. The underlying cause of diminished QoL in patients with SCI is often rooted in the distress and anxiety associated with chronic pain. MBCT addresses this issue by training patients to focus on the sensation of pain in their bodies and joints without reacting emotionally. This mindful observation can diminish negative emotional responses like anxiety and depression, which

often exacerbate pain in patients with SCI. MBCT encourages patients to allow their thoughts to arise and pass without attempting to alter, suppress, or expand upon them. This practice fosters a sense of detachment from intrusive thoughts, preventing them from spiraling into negative emotional states [36]. The current study acknowledges several limitations that should be addressed in future research. First, the absence of a follow-up period hinders the ability to assess the long-term effects of MBCT on illness acceptance and QoL. Second, the study did not examine how individual psychological characteristics, such as personality traits and coping styles, might influence treatment outcomes. Additionally, the potential impact of comorbid psychological conditions, such as depression and anxiety, on treatment response was not fully explored. Finally, the sample was limited to patients with spinal cord injury from Ahvaz, Iran, which restricts the generalizability of the findings to other patient populations.

Conclusions

The findings demonstrated that MBCT significantly improved illness acceptance and QoL in patients with SCI. The findings of this study underscore the therapeutic value of MBCT in addressing the psychological well-being of patients with SCI. By enhancing illness acceptance, MBCT can empower individuals to manage their condition more effectively, improve their QoL, and foster a greater sense of psychological resilience. Spinal cord injury rehabilitation programs should consider incorporating MBCT as a core therapeutic intervention. This could provide patients with the opportunity to learn mindfulness skills early in their recovery journey, promoting better adaptation and long-term well-being.

Acknowledgments

The authors express their gratitude to all individuals who participated in the research.

Author Contribution

AB conducted all stages of the study. AH supervised the study. FN advised the study.

Conflict of Interest

There is no conflict of interest for this study.

Ethical Permission

The research received approval from the Ethics Committee of Islamic Azad University, Ahvaz branch, under the code IR.IAU.AHVAZ.REC.1403.025

Funding

This research did not receive any specific grant from funding agencies in the public, commercial, or non-profit sectors.

References

1. Alcántar-Garibay OV, Incontri-Abraham D, Ibarra A. Spinal cord injury-induced cognitive impairment: a narrative review. *Neural Regen Res.* 2022;17(12):2649-2654. doi:10.4103/1673-5374.339475.
2. Lima R, Monteiro A, Salgado AJ, Monteiro S, Silva NA. Pathophysiology and Therapeutic Approaches for Spinal Cord Injury. *Int. J. Mol. Sci.* 2022; 23(22). doi: 10.3390/ijms232213833.
3. Evaniew N, Mazlouman SJ, Belley-Côté EP, Jacobs WB, Kwon BK. Interventions to Optimize Spinal Cord Perfusion in Patients with Acute Traumatic Spinal Cord Injuries: A Systematic Review. *J Neurotrauma.* 2020;37(9):1127-1139. doi:10.1089/neu.2019.6844.
4. Duff J, Ellis R, Kaiser S, Grant LC. Psychological Screening, Standards and Spinal Cord Injury: Introducing Change in NHS England Commissioned Services. *J Clin Med.* 2023;12(24):7667. doi:10.3390/jcm12247667.
5. Griffin JM, Bradke F. Therapeutic repair for spinal cord injury: combinatory approaches to address a multifaceted problem. *EMBO Mol Med.* 2020;12(3):e11505. doi:10.15252/emmm.201911505.
6. Ahuja CS, Wilson JR, Nori S, Kotter MRN, Druschel C, Curt A, et al. Traumatic spinal cord injury. *Nat Rev Dis Primers.* 2017;3(1):17018. doi: 10.1038/nrdp.2017.18.
7. Kim S, Whibley D, Williams DA, Kratz AL. Pain Acceptance in People With Chronic Pain and Spinal Cord Injury: Daily Fluctuation and Impacts on Physical and Psychosocial Functioning. *J Pain.* 2020;21(3-4):455-466. doi:10.1016/j.jpain.2019.08.014.
8. Farahani MF, Khankeh HR, Hosseini M, Dalvandi A, NorouziTabrizi K. Exploring Facilitators of Regaining Autonomy in People with Spinal Cord Injury: A Qualitative Study. *Iran J Nurs Midwifery Res.* 2021;26(2):154-161. doi:10.4103/ijnmr.IJNMR_25_20.
9. Kowalewska B, Cybulski M, Jankowiak B, Krajewska-Kulak E. Acceptance of Illness, Satisfaction with Life, Sense of Stigmatization, and Quality of Life among People with Psoriasis: A Cross-Sectional Study. *Dermatol. Ther.* 2020;10(3):413-30. doi: 10.1007/s13555-020-00368-w.
10. Anderson K, Aito S, Atkins M, Biering-Sørensen F, Charlifue S, Curt A, et al. Functional recovery

- measures for spinal cord injury: an evidence-based review for clinical practice and research. *J Spinal Cord Med.* 2008;31(2):133-44. doi: 10.1080/10790268.2008.11760704.
11. Dorsett P, Geraghty T, Sinnott A, Acland R. Hope, coping and psychosocial adjustment after spinal cord injury. *Spinal Cord Ser Cases.* 2017;3:17046. doi:10.1038/scsandc.2017.46.
 12. Schultz KR, Mona LR, Cameron RP. Mental Health and Spinal Cord Injury: Clinical Considerations for Rehabilitation Providers. *Curr Phys Med Rehabil Rep.* 2022;10(3):131-139. doi:10.1007/s40141-022-00349-4
 13. Schwartz CE, Stucky B, Rivers CS, Noonan VK, Finkelstein JA. Quality of Life and Adaptation in People With Spinal Cord Injury: Response Shift Effects From 1 to 5 Years Postinjury. *Arch. Phys. M.* 2018;99(8):1599-608.e1. doi: 10.1016/j.apmr.2018.01.028.
 14. Cardile D, Calderone A, De Luca R, Corallo F, Quartarone A, Calabrò RS. The Quality of Life in Patients with Spinal Cord Injury: Assessment and Rehabilitation. *J. Clin. Med."* 2024; 13(6):1820. doi: 10.3390/jcm13061820.
 15. Rofi'i AYAB, Maria R, Masfuri. Quality of life after spinal cord injury: An overview. *Enfermería Clínica.* 2019;29:1-4. doi: 10.1016/j.enfcli.2019.05.001.
 16. Kazemi SS, Panahi R, Rafighi M. Low Back Pain Intensity and Quality of Life among Patients referred to a Pain Clinic in Iran. *International Journal of Musculoskeletal Pain Prevention.* 2021;6(4):595-600. doi: 10.52547/ijmpp.6.4.595.
 17. Mugisa R, Kironde EL, Mwaka ES. Quality of life of patients with traumatic spinal cord injuries: a cross-sectional study at a tertiary hospital in Uganda. *Afr Health Sci.* 2023;23(3):521-533. doi:10.4314/ahs.v23i3.60.
 18. Daundasekara SS, Arlinghaus KR, Johnston CA. Quality of Life: The Primary Goal of Lifestyle Intervention. *Am J Lifestyle Med.* 2020;14(3):267-270. doi:10.1177/1559827620907309.
 19. Segal Z, Williams M, Teasdale J. Mindfulness-based cognitive therapy for depression: Guilford publications; 2018.
 20. Najafinejad S. Mindfulness Intervention for Chronic Low Back Pain: A Systematic Review. *International Journal of Musculoskeletal Pain Prevention.* 2022;7(1):670-8. doi: 10.52547/ijmpp.7.1.8.
 21. Sheikhzadeh M, Zanjani Z, Baari A. Efficacy of Mindfulness-Based Cognitive Therapy and Cognitive Behavioral Therapy for Anxiety, Depression, and Fatigue in Cancer Patients: A Randomized Clinical Trial. *Iran J Psychiatry.* 2021;16(3):271-280. doi:10.18502/ijps.v16i3.6252.
 22. Jahanshahi Hesari N, Asgari P, Naderi F, Heidari A. Effectiveness of Positive Mindfulness Therapy and Emotion-Focused Cognitive-Behavioral Therapy in Improving Pain Perception and Sleep Quality in Fibromyalgia Patients. *Int. J. Musculoskelet. Pain Prev.* 2021;6(4):564-72. doi: 10.52547/ijmpp.6.4.564.
 23. Im S, Stavas J, Lee J, Mir Z, Hazlett-Stevens H, Caplovitz G. Does mindfulness-based intervention improve cognitive function?: A meta-analysis of controlled studies. *Clin. Psychol. Rev.* 2021;84:101972. doi: 10.1016/j.cpr.2021.101972.
 24. Elices M, Pérez-Sola V, Pérez-Aranda A, Colom F, Polo M, Martín-López LM, et al. The Effectiveness of Mindfulness-Based Cognitive Therapy in Primary Care and the Role of Depression Severity and Treatment Attendance. *Mindfulness (N Y).* 2022;13(2):362-72. doi: 10.1007/s12671-021-01794-3.
 25. Nauta IM, van Dam M, Bertens D, Kessels RPC, Fasotti L, Uitdehaag BMJ, et al. Improved quality of life and psychological symptoms following mindfulness and cognitive rehabilitation in multiple sclerosis and their mediating role for cognition: a randomized controlled trial. *J Neurol.* 2024. doi: 10.1007/s00415-024-12327-y.
 26. Bao H. Intervention Effect of Mindfulness-Based Cognitive Therapy on Diabetes-Related Distress and Self-Care. *Iran J Public Health.* 2022;51(3):606-614. doi:10.18502/ijph.v51i3.8937.
 27. Camino M, Satorres E, Delhom I, Real E, Abella M, Meléndez JC. Mindfulness-based Cognitive Therapy to Improve Sleep Quality in Older Adults with Insomnia. *Psychosoc Interv.* 2022;31(3):159-167. doi:10.5093/pi2022a12.
 28. Beacham AO, Linfield K, Kinman CR, Payne-Murphy J. The chronic illness acceptance questionnaire: Confirmatory factor analysis and prediction of perceived disability in an online chronic illness support group sample. *Journal of Contextual Behavioral Science.* 2015;4(2):96-102. doi: 10.1016/j.jcbs.2015.03.001.
 29. Skevington SM, Lotfy M, O'Connell KA; WHOQOL Group. The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. *Qual Life Res.* 2004;13(2):299-310. doi:10.1023/B:QURE.0000018486.91360.00.
 30. Crane, R. Mindfulness-Based Cognitive Therapy Distinctive Features. Publisher : Routledge. 2017.
 31. Bulbuloglu S, Gunes H. Mindfulness-based cognitive therapy for adherence of immunosuppressive treatment in liver transplant recipients: A randomized controlled trial. *Explore (NY).* 2024. doi:10.1016/j.explore.2024.01.005
 32. Haugmark T, Hagen KB, Smedslund G, Zangi HA. Mindfulness- and acceptance-based interventions for patients with fibromyalgia - A systematic review and meta-analyses. *PLoS One.* 2019;14(9):e0221897. doi:10.1371/journal.pone.0221897.
 33. Marks E, Moghaddam N, De Boos D, Malins S. A systematic review of the barriers and facilitators to adherence to mindfulness-based cognitive therapy for those with chronic conditions. *Br. J. Health Psychol.* 2023;28(2):338-65. doi: 10.1111/bjhp.12628.
 34. Arvaneh E, Mohammadi Shirmahleh F, Gholami

- Tooranposhti M, Meschi F. Comparing the Effectiveness of Coping Skills and Mindfulness-Based Training on Pain Perception in Patients with Renal Failure. *International Journal of Musculoskeletal Pain Prevention* 2023;8(1):827-35. doi: 10.22034/ijmpp.8.1.827.
35. Chacko E, Ling B, Avny N, Barak Y, Cullum S, Sundram F, et al. Mindfulness-Based Cognitive Therapy for Stress Reduction in Family Carers of People Living with Dementia: A Systematic Review. *Int J Environ Res Public Health*. 2022;19(1). doi: 10.3390/ijerph19010614.
36. Hofmann SG, Gómez AF. Mindfulness-Based Interventions for Anxiety and Depression. *Psychiatr Clin North Am*. 2017;40(4):739-749. doi:10.1016/j.psc.2017.08.008.