



Effectiveness of Mindfulness-Integrated Cognitive-Behavioral Group Therapy in Motivational Structure of Hepatitis B Patients

Marjan Faramarzi ¹, Javad Khalatbari ^{1,*}, Shohreh Ghorban Shiroudi ¹ and Khadijeh Abolmaali ²

¹Department of Psychology, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran

²Department of Psychology, Roudehen Branch, Islamic Azad University, Roudehen, Iran

*Corresponding author: Department of Psychology, Tonekabon Branch, Islamic Azad University, Tonekabon, Iran. Email: javadkhalatbaripsy2@gmail.com

Received 2021 November 17; **Revised** 2021 December 12; **Accepted** 2022 January 07.

Abstract

Background: It is essential to understand and support hepatitis B patients to minimize their challenges and limitations and provide them with appropriate treatment. Therefore, it is essential to incorporate training and consulting programs to prepare for and identify various aspects of the disease.

Objectives: The present study aimed to investigate the effectiveness of mindfulness-integrated cognitive-behavioral group therapy (MiCBT) in the motivational structure of hepatitis B patients in Tehran, Iran.

Methods: This quasi-experimental study utilized a pretest-posttest design with a control group. The study sample consisted of 28 hepatitis B patients selected from all patients visiting specialist clinics in Tehran in 2020. Following the interviews and completion of the Personal Concerns Inventory, 14 patients were selected per group using simple random sampling and were randomly divided into intervention and control groups. A posttest was conducted after 12 sessions of MiCBT (one 90-min group session weekly for three months). Data were analyzed using the multivariate analysis of covariance in SPSS software.

Results: The results revealed a significant increase in adaptive motivational structure ($P < 0.001$) and a significant decrease in maladaptive motivational structure ($P = 0.012$) in hepatitis B patients following the therapeutic intervention.

Conclusions: The study indicated the MiCBT effectiveness in increasing adaptive motivational structure and decreasing maladaptive motivational structure in hepatitis B patients. As a therapeutic approach, MiCBT can make the motivational structure of hepatitis B patients more adaptive.

Keywords: Cognitive-Behavioral Therapy, Mindfulness, Motivation, Hepatitis B

1. Background

Chronic viral hepatitis is a considerable threat to global health, with a 3.5% global prevalence in the general population (1). Carriers of hepatitis B are at high risk for hepatocellular carcinoma (HCC), and they are assessed for chronic liver disease severity according to the model for end-stage liver disease (MELD) (2, 3). Like other chronic diseases, hepatitis B affects individuals' mental and social health and brings about clinical complications (4). In general, hepatitis B patients are not emotionally healthy (5). Besides the severe complications of hepatitis B, the patients suffer from severe depression and anxiety due to medications such as interferon, ribavirin, and amantadine. In addition, numerous disease complications, medication side effects, and society's rejection can induce emotional instability. These patients become very irritable, have a shallow tolerance threshold, and develop psycho-

logical problems over time (6).

The effects of psychosocial (stigma, disclosure, depression, and anxiety) and medical (medication-induced psychological disorders) factors in hepatitis patients B indicate that they tend to suffer from mental disorders that can affect their motivation (7, 8). Mental health is the prerequisite for motivation and goal orientation. Although the motivational structure in chronic diseases, in general, and hepatitis, in particular, is unclear, social and psychological issues and problems may make the motivational structure more maladaptive (9, 10). Cox and Klinger (11) defined adaptive and maladaptive motivational structures. They assumed that individuals with the maladaptive motivational structure are more likely to provoke their emotions in unhealthy ways. These individuals usually look for avoidance goals and believe that achieving them will be of little pleasure. On the contrary, individuals with adap-

tive motivational structures spend their resources pursuing healthy goals (12).

Individuals with the maladaptive motivational structure are more likely to feel less satisfied with life, are less motivated to change their behaviors and care for themselves, and suffer from lower psychological health than those with adaptive motivational structures. The motivational construct view posits that people with maladaptive motivational structures have avoidance motivation and negative incentives to pursue their ambitions. They need the training to change their maladaptive motivational structure and make it more adaptive (13, 14). Furthermore, hepatitis B patients experience various psychological reactions that must be controlled and managed by themselves or health care providers. Therefore, it is essential to design health interventions emphasizing psychological care to prevent problems and implement training programs and counseling on hepatitis B (15). Psychological interventions and training for patients with chronic diseases are essential to not only enable them to adapt to the disease but also "motivate" them through treatment and follow-up. Many difficulties are linked with motivating patients in the long run, which makes caregivers' work frustrating. In practice, "motivating the patients" is often not an easy task, mainly where many behavioral changes must be made in their lives (16).

Cognitive-behavioral therapy (CBT) is the first-line treatment for those with motivational dysfunctions and has had the most evidence of effectiveness (17). This therapy aims to enable individuals to let go of false assumptions and identify the irrational ways of dealing with issues (18, 19). Depression, anxiety, and stress may result from cognitive distortions caused by maladaptive motivational structures in hepatitis patients. The cognitive-behavioral concept can be effective in coping with maladaptive motivational structure through cognitive restructuring (20). Mindfulness is a third-wave therapy that has received considerable attention in recent years. Through the mindfulness practices, participants learn to observe their thoughts and feelings (21). Mindfulness skills training increases individuals' motivation to achieve and stay committed to their goals, reduce avoidance, and believe in the chance and perceived duration of the goal (22).

2. Objectives

Based on the above considerations, the present study aimed to investigate the effectiveness of mindfulness-integrated cognitive-behavioral group therapy (MiCBT) in the motivational structure of hepatitis B patients.

3. Methods

This quasi-experimental study was conducted using a pretest-posttest design with a control group. The statistical population comprised all hepatitis B patients, aged 25 and 45 years, living in Tehran (Tehran Association of Patients with Liver Diseases) in 2020 with relatively high maladaptive motivational structure. Sample selection for the present study was made from May to July 2020. Twenty-eight hepatitis B patients were selected using convenience sampling and randomly divided into intervention ($n = 14$) and control ($n = 14$) groups. We included 14 hepatitis B patients in each group using G-power statistical software with a test power of 0.95 and $\alpha = 0.05$. The researcher did randomization after obtaining participants' consent, and the participants were assigned to the groups by the table of random numbers. The patients were selected based on specialized hepatitis diagnostic tests under the supervision of internal medicine specialists. Inclusion criteria were an age of 20 - 45 years, hepatitis B diagnosis, minimum high school education, and absence of brain damage, mental retardation, hallucinations, delusions, and depression. The exclusion criteria included a history of mental illness diagnosis and absence from more than two treatment sessions. As the participants were selected and assigned to the intended groups, good relations were made to attract their cooperation, and necessary explanations were provided. Informed consent was obtained from them to participate in the study and perform the tests. First, a psychologist examined all participants using the motivational structure scale under similar conditions. Questionnaires were filled out anonymously, and the therapists guaranteed the therapist-client confidentiality. For ethical considerations, the researchers received written consent from the participants in the research.

The corresponding author, a Ph.D. student in health psychology and formal training in CBT and mindfulness, implemented the therapeutic interventions. Each group therapy session was designed based on the integrative cognitive-behavioral approach. The control group received no MiCBT. At the end of the study, to observe ethical considerations, the control group received a course of MiCBT. The intervention group participated in 12 group therapy sessions (one 90-min session weekly for three months) using MiCBT. A summary of group therapy sessions using MiCBT is presented in Table 1.

3.1. Instruments

3.1.1. Demographics Questionnaire

In the present study, a researcher-made questionnaire was used to collect the demographic characteristics of the

Table 1. A summary of Mindfulness-integrated Cognitive-behavioral Group Therapy Sessions

Sessions	Description
1	Establishing the initial communication, describing goals and methods, reviewing the extant problems among hepatitis B patients, interacting and goal setting; automatic guidance of introduction (how they were persuaded to enter the group and what they want to talk about in the group), setting the policy of the meetings, inviting the participants to keep the information and events of the meetings confidential, obtaining written consent from the participants; practicing mindful raisin meditation with the physical examination.
2	Clinical Assessment of Behavior (CAB) training, identifying irrational thoughts about hepatitis B and its impact; "overcoming obstacles," examining assignments and sharing experiences from them, practicing physical examinations, reviewing exercises, mindful breathing, practicing thoughts and feelings, and reviewing exercises.
3	Problem-solving training, mindful breathing (and mindful physical activities), mindful movement and reviewing the exercise, practicing seeing and hearing, practicing breathing and stretching (mindful breathing and stretching, and then sitting meditation while focusing on breathing and the body), reviewing the exercise, and performing the three-minute breathing space practice.
4	Providing information on medicinal and therapeutic issues for hepatitis B. "staying in the present moment," visual or auditory mindfulness, sitting meditation (awareness of breath, body, sounds, thoughts, and consciousness without specific bias) and reviewing it, performing three-minute breathing space practices, discussing chronic pain and components of psychological capital and psychological well-being.
5	Teaching interpersonal coping skills and desirable social skills, improving communication in general and in particular; "acceptance and permission/permission to attend," reviewing assignments, sitting meditation and reviewing it, performing three-minute breathing space practice, imagining a problematic state, and exploring its impact on the body and mind, and reading poetry.
6	Teaching positivism towards hepatitis B and discovering strengths, group discussion, and designing supplementary activities; "thoughts not facts" practice, sitting meditation and reviewing it, awareness of breath, body, sounds, and thoughts and then reviewing and examining its impact on the body and mind, performing three-minute breathing space practice, and explaining "a gate to the body" to explore more ways to it.
7	Cognitive reconstruction through replacing irrational thoughts with logical thoughts, group discussion, and supplementary activities; "how can I best take care of myself," sitting meditation and reviewing exercises, awareness of breath, body, sounds, thoughts, and emotions and reviewing exercises, understanding the relationship between activity and mood, preparing a list of daily activities, and determining which one is boring or uplifting and which one creates a sense of dominance or pleasure in the person.
8	Explaining the principle of "applying what has been learned on future experiences," reviewing assignments, sitting meditation, summarizing, receiving written comments from participants in the course of cognitive distortions, and cognitive self-control techniques.
9	Teaching communication skills and group discussions along with supplementary activities.
10	Immunization training against hepatitis B-induced stress and anxiety, group discussion, and supplementary activities.
11	Following-up of interventions, QA session for hepatitis B patients and the therapist.
12	Summarizing feedback, expressing feelings, and concluding the discussion.

participants, including age, education, marital status, and history of the disease.

3.1.2. Personal Concerns Inventory

The 10-item personal concerns inventory (PCI) was developed by Cox and Klinger in 2004 to assess the motivational structure. It was completed in three phases, and participants scored the items from 0 to 10 in 11 facets of life, including: (1) achievement: the degree of inclination or desire to achieve goals; (2) avoidance: prevention or avoidance of achieving goals; (3) control: the amount of control over that goal; (4) the amount of information about how to achieve goals; (5) the probability of success if one tries; (6) chance: participant's belief in the chance to achieve goals without effort; (7) satisfaction in the intervention of achievement that is expected when achieving goals; (8) dissatisfaction when achieving goals; (9) dissatisfaction with not achieving goals; (10) commitment: the degree of determination to achieve goals; and (11) the probable time required to achieve goals. In this inventory, items 1, 2, 3, 4, 6, and 7 were about adaptive motivational structure, and items 5 and 8 were about maladaptive motivational structure. The minimum and maximum scores for adaptive motivational structure are 0 and 60, respectively. A higher score indicates a higher level of adaptive motiva-

tional structure. Moreover, the minimum and maximum scores of the maladaptive motivational structure are 0 and 20, respectively. A higher score indicates a higher level of maladaptive motivational structure (23). Ebrahimi et al. (24) reported Cronbach's alpha of 0.75 for the questionnaire. In this study, Cronbach's alpha coefficient was 0.79 for the questionnaire.

3.2. Statistical Analyses

Data were analyzed by descriptive and inferential statistics, such as mean, standard deviation, and multivariate analysis of covariance. SPSS version 19.0 was further used for analyzing the data.

4. Results

In this study, 28 female patients with hepatitis B were investigated to determine the effect of integrative group therapy. According to the descriptive findings, the mean age was 34.15 ± 6.48 and 31.86 ± 5.38 years in the intervention and control groups, respectively. The demographic characteristics of the participants are shown in Table 2.

Motivational structures in the pretest and posttest were measured for the intervention and control groups,

Table 2. Demographic Characteristics of the Participants ^a

Groups	Age (y)	Duration of illness (y)	Education		Marital Status	
			High School Education	College Education	Married	Single
Intervention	34.15 ± 6.48	4.75 ± 2.39	9 (64.29)	5 (35.71)	4 (28.57)	10 (71.43)
Control	31.86 ± 5.38	5.11 ± 2.75	10 (71.43)	4 (28.57)	5 (35.71)	9 (64.29)

^a Values are expressed as mean ± SD or No. (%).

as shown in Table 3. The results indicated that the intervention group's mean score of the adaptive motivational structure increased from 30.50 ± 7.11 in the pretest to 44.00 ± 12.26 in the posttest. The mean score of maladaptive motivational structure decreased from 12.21 ± 3.04 in the pretest to 6.78 ± 4.63 in the posttest, while there was no significant change in the control group.

Table 3. Mean ± Standard Deviation (SD) of Variables in Experimental and Control Groups in Pretest and Posttest

Variables and Phase	Intervention	Control	P
Adaptive motivational structure			
Pretest	30.50 ± 7.11	27.35 ± 7.02	0.328
Posttest	44.00 ± 12.26	23.42 ± 6.06	0.001
Maladaptive motivational structure			
Pretest	12.21 ± 3.04	11.85 ± 3.48	0.687
Posttest	6.78 ± 4.63	10.92 ± 3.95	0.011

Abbreviation: MiCBT, mindfulness-integrated cognitive-behavioral group therapy.

Data distribution was examined, and the Shapiro-Wilk test and Levene's test were used to see whether data were parametric or non-parametric. The results indicated that the sample had a normal distribution. The non-significant results of Levene's test for both components of motivational structure including maladaptive motivational structure in the pretest [$F(1, 26) = 0.82, P = 0.777$] and posttest [$F(1, 26) = 0.97, P = 0.333$] and adaptive motivational structure in the pretest [$F(1, 26) = 3.024, P = 0.0.94$] and posttest [$F(1, 26) = 0.18, P = 0.676$] indicated the homogeneity of variances. The Box's M test revealed the homogeneity of the covariance matrices. The test indicated that the homogeneity of the covariance matrices was met (Box's $M = 8.57, F = 2.62, P = 0.050$); thus, the analysis of covariance was permitted.

The MANCOVA results indicated a significant difference between the intervention and control groups in at least one variable by eliminating the pretest effect ($F = 24.12, P < 0.001$). Univariate analysis of covariance was conducted to decide which variable contributed to this significant difference, as presented in Table 4. The results

suggested a significant difference between the intervention and control groups in adaptive motivational structure ($F = 36.79, P = 0.001, \eta^2 = 0.60$). Based on the results, the mean score of the adaptive motivational structure increased towards being more adaptive from the pretest to the posttest. In other words, MiCBT improved the scores of motivational structure of participants in the intervention group compared with the control group. There was a significant difference between the intervention and control groups in maladaptive motivational structure ($F = 7.31, P = 0.012, \eta^2 = 0.23$). The effect rate was 0.23, i.e., 23% of individual differences in the posttest scores of the maladaptive motivational structure were related to the effect of integrative psychological interventions.

5. Discussion

The present study aimed to investigate the effectiveness of MiCBT in the motivational structure of hepatitis B patients. The results indicated that MiCBT significantly increased adaptive motivational structure in hepatitis B patients, which is in line with the results of Javaherforushzadeh and Soltani Kuhbanani (25), demonstrating that mindfulness skills training increased motivation to achieve and stay committed to goals, reduced avoidance, and belief in chance, and perceived duration of achieving goals. Much research has been conducted on the effect of mindfulness on depression, stress, aggression, anxiety, and many other disorders, showing positive results (26-28).

In the mindfulness part of this course, the participants were enabled to pay attention to the warning signs of anxiety, repetitive thinking cycles, and distraction of negative thoughts (21). The therapy emphasized the understanding of the cognitive and psychological dimensions of experiences, and the participants learned how to divert their minds from one approach to another while becoming aware of their mental patterns at all times through mindfulness exercises (26). They practiced being more aware of negative thoughts and feelings in case of potential relapse and responding to those thoughts and feelings in a way that enables them to detach themselves from frustrating

Table 4. Results of Univariate ANCOVA on Motivational Structure of Hepatitis B Patients

Variables	SS	df	MS	F	P	η^2	Power
Adaptive motivational structure	3253.92	1	3283.92	36.79	0.001	0.60	1.00
Maladaptive motivational structure	130.31	1	130.30	7.31	0.012	0.23	0.74

and depressing thoughts. It developed their mental ability to achieve their goals (27). Considering that emotional discharge was one of the main themes in mindfulness and cognitive-behavioral intervention, it seems that the integrative intervention positively affected their emotions in achieving goals (29). Individuals who are more aware of their emotions and feelings and are non-judgmental experience more positive emotions, which, in turn, reduces problems and encourages the use of appropriate strategies to cope with challenges. In addition, it makes people reappraise life events more positively, which boosts their life expectancy (30). Therefore, integrative therapy seems to increase life expectancy, enthusiastic motivation, optimism in achieving goals, emotional involvement in achieving goals, and mental empowerment among patients, making their motivational structure more adaptable.

Since this study was conducted on female patients with hepatitis B in Tehran, precautions should be taken if the results are generalized to other centers and cities. It is also suggested to examine the effectiveness of this intervention in the male population.

5.1. Conclusion

This study confirmed the effectiveness of the integrative approach in improving the motivational structure. In the context of comprehensive, supportive, and palliative programs of MiCBT, especially in a specific situation such as the peak of psychosocial problems in hepatitis patients, it is suggested to incorporate MiCBT in therapeutic interventions to boost the patients' purposefulness and adaptive motivation. Applying the therapeutic package based on the proposed model in line with medical interventions is suggested. We used a unisex statistical sample in this study, including only female patients with hepatitis B. Moreover, the target population came from Tehran, Iran. It is suggested that future studies be conducted on other statistical populations to use the results as a basis for comparison in a meta-analysis.

Footnotes

Authors' Contribution: Marjan Faramarzi and Javad Khalatbari, study concept and design, data acquisition, analysis, and interpretation, and statistical analysis; Shohreh

Ghorban Shiroudi and Khadijeh Abolmaali, administrative, technical, material support, and study supervision; Javad Khalatbari, critical revision of the manuscript for important intellectual content.

Conflict of Interests: No conflict of interest is declared.

Ethical Approval: The study was approved by the Ethics Committee of Islamic Azad University-Tonekabon Branch (code: IR.IAU.TON.REC.1399.058).

Funding/Support: This study did not receive any funding.

Informed Consent: Researchers received written consent from the participants in the research.

References

1. Zampino R, Boemio A, Sagnelli C, Alessio L, Adinolfi LE, Sagnelli E, et al. Hepatitis B virus burden in developing countries. *World J Gastroenterol.* 2015;**21**(42):11941-53. doi: [10.3748/wjg.v21.i42.11941](#). [PubMed: [26576083](#)]. [PubMed Central: [PMC4641116](#)].
2. Niederau C. Chronic hepatitis B in 2014: Great therapeutic progress, large diagnostic deficit. *World J Gastroenterol.* 2014;**20**(33):11595-617. doi: [10.3748/wjg.v20.i33.11595](#). [PubMed: [25206267](#)]. [PubMed Central: [PMC4155353](#)].
3. Zhang Z, Chen C, Li Z, Wu YH, Xiao XM. Individualized management of pregnant women with high hepatitis B virus DNA levels. *World J Gastroenterol.* 2014;**20**(34):12056-61. doi: [10.3748/wjg.v20.i34.12056](#). [PubMed: [25232243](#)]. [PubMed Central: [PMC4161794](#)].
4. Hardani F, Elahi N, Jahani S, Haghighi zadeh M, Alavi Nejad P. Effectiveness of the Professional Collaboration of Care-Centered Model (PCCC) on the Knowledge of Patients with Hepatitis B Regarding Preventive Behaviors. *Jundishapur J Chronic Dis Care.* 2016;**5**(4). e33617. doi: [10.17795/jjcdc-33617](#).
5. Modabbernia A, Ashrafi M, Malekzadeh R, Poustchi H. A review of psychosocial issues in patients with chronic hepatitis B. *Arch Iran Med.* 2013;**16**(2):114-22. [PubMed: [23360635](#)].
6. Sertoz OO, Tuncel OK, Tasbakan MI, Pullukcu H, Onmus IRD, Yamazhan T, et al. Depression and anxiety disorders during pegylated interferon treatment in patients with chronic hepatitis B. *Psychiatry Clin Psychopharmacol.* 2017;**27**(1):47-53. doi: [10.1080/24750573.2017.1293251](#).
7. Fufeld L, Aggarwal J, Dougher C, Vera-Llonch M, Bubbs S, Donepudi M, et al. Assessment of motivating factors associated with the initiation and completion of treatment for chronic hepatitis C virus (HCV) infection. *BMC Infect Dis.* 2013;**13**:234. doi: [10.1186/1471-2334-13-234](#). [PubMed: [23701894](#)]. [PubMed Central: [PMC3669083](#)].
8. Liu C, Nicholas S, Wang J. The association between protection motivation and hepatitis b vaccination intention among migrant workers in Tianjin, China: A cross-sectional study. *BMC Public Health.* 2020;**20**(1):1219. doi: [10.1186/s12889-020-09292-2](#). [PubMed: [32778075](#)]. [PubMed Central: [PMC7418384](#)].
9. Chang CH, Liu CY, Chen SJ, Tsai HC. Hepatitis C virus and hepatitis B virus in patients with schizophrenia. *Medicine (Baltimore).*

- 2021;**100**(22). e26218. doi: [10.1097/MD.00000000000026218](https://doi.org/10.1097/MD.00000000000026218). [PubMed: [34087899](https://pubmed.ncbi.nlm.nih.gov/34087899/)]. [PubMed Central: [PMC8183751](https://pubmed.ncbi.nlm.nih.gov/PMC8183751/)].
10. Frost H, Campbell P, Maxwell M, O'Carroll RE, Dombrowski SU, Williams B, et al. Effectiveness of Motivational Interviewing on adult behaviour change in health and social care settings: A systematic review of reviews. *PLoS One*. 2018;**13**(10). e0204890. doi: [10.1371/journal.pone.0204890](https://doi.org/10.1371/journal.pone.0204890). [PubMed: [30335780](https://pubmed.ncbi.nlm.nih.gov/30335780/)]. [PubMed Central: [PMC6193639](https://pubmed.ncbi.nlm.nih.gov/PMC6193639/)].
11. Cox W, Klinger E. Motivational structure. *Addict Behav*. 2002;**27**(6):925–40. doi: [10.1016/S0306-4603\(02\)00290-3](https://doi.org/10.1016/S0306-4603(02)00290-3).
12. D'Souza PC, Mathai PJ. Motivation to change and factors influencing motivation in alcohol dependence syndrome in a tertiary care hospital. *Indian J Psychiatry*. 2017;**59**(2):183–8. doi: [10.4103/psychiatry.IndianJPsychiatry_262_15](https://doi.org/10.4103/psychiatry.IndianJPsychiatry_262_15). [PubMed: [28827865](https://pubmed.ncbi.nlm.nih.gov/28827865/)]. [PubMed Central: [PMC5547859](https://pubmed.ncbi.nlm.nih.gov/PMC5547859/)].
13. Pilch I, Wardawski P, Probiez E. The predictors of adaptive and maladaptive coping behavior during the COVID-19 pandemic: The Protection Motivation Theory and the Big Five personality traits. *PLoS One*. 2021;**16**(10). e0258606. doi: [10.1371/journal.pone.0258606](https://doi.org/10.1371/journal.pone.0258606). [PubMed: [34665837](https://pubmed.ncbi.nlm.nih.gov/34665837/)]. [PubMed Central: [PMC8525766](https://pubmed.ncbi.nlm.nih.gov/PMC8525766/)].
14. Musetti A, Mancini T, Corsano P, Santoro G, Cavallini MC, Schimmenti A. Maladaptive Personality Functioning and Psychopathological Symptoms in Problematic Video Game Players: A Person-Centered Approach. *Front Psychol*. 2019;**10**:2559. doi: [10.3389/fpsyg.2019.02559](https://doi.org/10.3389/fpsyg.2019.02559). [PubMed: [31803104](https://pubmed.ncbi.nlm.nih.gov/31803104/)]. [PubMed Central: [PMC6877750](https://pubmed.ncbi.nlm.nih.gov/PMC6877750/)].
15. Tu T, Block JM, Wang S, Cohen C, Douglas MW. The Lived Experience of Chronic Hepatitis B: A Broader View of Its Impacts and Why We Need a Cure. *Viruses*. 2020;**12**(5). doi: [10.3390/v12050515](https://doi.org/10.3390/v12050515). [PubMed: [32392763](https://pubmed.ncbi.nlm.nih.gov/32392763/)]. [PubMed Central: [PMC7290920](https://pubmed.ncbi.nlm.nih.gov/PMC7290920/)].
16. Valizadeh L, Zamanzadeh V, Negarandeh R, Zamani F, Hamidia A, Zabihi A. Psychological Reactions among Patients with Chronic Hepatitis B: a Qualitative Study. *J Caring Sci*. 2016;**5**(1):57–66. doi: [10.15171/jcs.2016.006](https://doi.org/10.15171/jcs.2016.006). [PubMed: [26989666](https://pubmed.ncbi.nlm.nih.gov/26989666/)]. [PubMed Central: [PMC4794545](https://pubmed.ncbi.nlm.nih.gov/PMC4794545/)].
17. Molavi S, Seraj Khorrami N, Ehteshamzadeh P, Sayyah M. Effectiveness of Mindfulness-Based Cognitive Therapy on Sleep Quality and Perceived Social Support Improvement in Patients with HIV/AIDS. *Jundishapur J Chronic Dis Care*. 2020;**9**(1). e99449. doi: [10.5812/jjcdc.99449](https://doi.org/10.5812/jjcdc.99449).
18. Seyedmoharrami I, Pashib M, Tatari M, Mohammadi S. The effect of Cognitive-behavioral Group Therapy on Achievement Motivation and Academic Failure students among students of university of medical sciences. *Journal of Torbat Heydariyeh University of Medical Sciences*. 2016;**4**(1):17–23.
19. Thomas N. What's really wrong with cognitive behavioral therapy for psychosis? *Front Psychol*. 2015;**6**:323. doi: [10.3389/fpsyg.2015.00323](https://doi.org/10.3389/fpsyg.2015.00323). [PubMed: [25870572](https://pubmed.ncbi.nlm.nih.gov/25870572/)]. [PubMed Central: [PMC4375916](https://pubmed.ncbi.nlm.nih.gov/PMC4375916/)].
20. Fortier E, Alavi M, Bruneau J, Micallef M, Perram J, Sockalingam S, et al. Depression, Anxiety, and Stress Among People With Chronic Hepatitis C Virus Infection and a History of Injecting Drug Use in New South Wales, Australia. *J Addict Med*. 2017;**11**(1):10–8. doi: [10.1097/ADM.0000000000000261](https://doi.org/10.1097/ADM.0000000000000261). [PubMed: [27775955](https://pubmed.ncbi.nlm.nih.gov/27775955/)].
21. Nobakht H. The Effectiveness of Mindfulness-Based Stress Reduction Group Therapy in Rumination Among Multiple Sclerosis Patients. *Jundishapur J Chronic Dis Care*. 2019;**8**(2). e84819. doi: [10.5812/jjcdc.84819](https://doi.org/10.5812/jjcdc.84819).
22. Lindsay EK, Chin B, Greco CM, Young S, Brown KW, Wright AGC, et al. How mindfulness training promotes positive emotions: Dismantling acceptance skills training in two randomized controlled trials. *J Pers Soc Psychol*. 2018;**115**(6):944–73. doi: [10.1037/pspa0000134](https://doi.org/10.1037/pspa0000134). [PubMed: [30550321](https://pubmed.ncbi.nlm.nih.gov/30550321/)]. [PubMed Central: [PMC6296247](https://pubmed.ncbi.nlm.nih.gov/PMC6296247/)].
23. Sellen JL, McMurran M, Cox WM, Theodosi E, Klinger E. The Personal Concerns Inventory (Offender Adaptation): Measuring and enhancing motivation to change. *Int J Offender Ther Comp Criminol*. 2006;**50**(3):294–305. doi: [10.1177/0306624X05281829](https://doi.org/10.1177/0306624X05281829). [PubMed: [16648384](https://pubmed.ncbi.nlm.nih.gov/16648384/)].
24. Ebrahimi E, Abolmaali Alhoseini K, Hashemian K. Psychometric properties of Motivational Structure Questionnaire in female and male second secondary education adolescent. *Quarterly of Applied Psychology*. 2019;**13**(2):317–33.
25. Javaherforushzadeh M, Soltani Kuhbanani S. The effectiveness of training mindfulness skills on motivational structures among girl students. *Journal of Fundamentals of Mental Health*. 2016;**18**:436–40.
26. Parmentier FBR, Garcia-Toro M, Garcia-Campayo J, Yanez AM, Andres P, Gili M. Mindfulness and Symptoms of Depression and Anxiety in the General Population: The Mediating Roles of Worry, Rumination, Reappraisal and Suppression. *Front Psychol*. 2019;**10**:506. doi: [10.3389/fpsyg.2019.00506](https://doi.org/10.3389/fpsyg.2019.00506). [PubMed: [30906276](https://pubmed.ncbi.nlm.nih.gov/30906276/)]. [PubMed Central: [PMC6418017](https://pubmed.ncbi.nlm.nih.gov/PMC6418017/)].
27. Zhang D, Lee EKP, Mak ECW, Ho CY, Wong SYS. Mindfulness-based interventions: An overall review. *Br Med Bull*. 2021;**138**(1):41–57. doi: [10.1093/bmb/ldab005](https://doi.org/10.1093/bmb/ldab005). [PubMed: [33884400](https://pubmed.ncbi.nlm.nih.gov/33884400/)]. [PubMed Central: [PMC8083197](https://pubmed.ncbi.nlm.nih.gov/PMC8083197/)].
28. de la Fuente-Anuncibay R, Gonzalez-Barbadillo A, Ortega-Sanchez D, Ordóñez-Cambor N, Pizarro-Ruiz JP. Anger Rumination and Mindfulness: Mediating Effects on Forgiveness. *Int J Environ Res Public Health*. 2021;**18**(5). doi: [10.3390/ijerph18052668](https://doi.org/10.3390/ijerph18052668). [PubMed: [33800890](https://pubmed.ncbi.nlm.nih.gov/33800890/)]. [PubMed Central: [PMC7967311](https://pubmed.ncbi.nlm.nih.gov/PMC7967311/)].
29. Samadi H, Ayatizadeh F, Axt G, Machado S. Comparison between mindfulness and cognitive-behavioral psychological interventions on the reduction of pre-competitive stress of elite shooters: A follow-up of 2 months. *Cuad de Psicología del Deporte*. 2021;**21**(1):192–203.
30. Dasht Bozorgi Z, Alipoor S, Shahandeh A, Payan S. Predicting the life expectancy in nurse based on happiness, acting to religious beliefs and psychological hardness. *J Nurs Manag*. 2018;**6**(3):57–65. doi: [10.29252/ijnv.6.3.4.57](https://doi.org/10.29252/ijnv.6.3.4.57).