Journal of
Babol University of Medical Sciences
JBUMS
e-ISSN: 2251-7170 p-ISSN: 1561-4107

The Effectiveness of Lifestyle-Focused Cognitive Behavioral Therapy versus Semantic Cognitive Restructuring Therapy on Chronic Fatigue in Patients with Irritable Bowel Syndrome

M. Akbari Ebtekar (MSc)[1], S. O. Emadian (PhD)[*1], B. Mirzaian (PhD)[1]

1.Department of Psychology, Sari Branch, Islamic Azad University, Sari, I.R.Iran..

•Corresponding Author: S. O. Emadian (PhD)
Address: Department of Psychology, Sari Branch, Islamic Azad University, Sari, I.R.Iran.
Tel: +98 (11) 33301125. **E-mail:** emadian2012@yahoo.com

Article Type
Research Paper

Received:
Mar 29th 2024
Revised:
May15th 2024
Accepted:
Jun 23rd 2024

ABSTRACT

Background and Objective: Gastrointestinal diseases are one of the most important and common chronic non-communicable diseases that impose a great economic burden and psychological pressure on society and the healthcare system. Considering the ambiguity in the field of cognitive etiology and treatment of irritable bowel syndrome, this study was conducted to compare the effectiveness of lifestyle-focused cognitive behavioral therapy versus semantic cognitive restructuring therapy on chronic fatigue in patients with irritable bowel syndrome.

Methods: This cross-sectional study was conducted among 45 patients with irritable bowel syndrome who referred to a private clinic. Patients were assigned into 3 groups (n=15) of lifestyle-focused cognitive behavioral therapy, semantic cognitive restructuring therapy, and a control group that did not receive any cognitive therapy with a pretest-posttest design. The Multidimensional Fatigue Inventory with 5 subscales of general fatigue, physical fatigue, reduced activity, reduced motivation, and mental fatigue was used for data collection. The total score of the patient's fatigue intensity is obtained from 0 to 100, where a score of 20-40 indicates low fatigue, 40-60 indicates moderate fatigue, and a score above 60 indicates high fatigue in the individual. Groups were compared before, after and one month after treatment.

Findings: 22 women (48.9%) and 23 men (51.1%) in the age group of 25-49 years participated in this study. The findings showed that lifestyle-focused cognitive behavioral therapy with a score of (53.53±11.12) and semantic cognitive restructuring therapy with a score of (60.40±14.57) in the post-test, and with scores (55.80±11.68 and 59.72±14.94, respectively) in the follow-up after four months were effective on chronic fatigue in patients with irritable bowel syndrome ($p<0.05$). These two intervention groups also showed a significant difference compared with the control group (64.53±15.70 and 64.46±15.77, respectively) ($p<0.05$).

Conclusion: The results of the study showed that lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy are effective on chronic fatigue in patients with irritable bowel syndrome.

Keywords: *Cognitive Behavioral Therapy, Lifestyle, Semantic Cognitive Restructuring Therapy, Chronic Fatigue, Irritable Bowel Syndrome*.

Cite this article: Akbari Ebtekar M, Emadian SO, Mirzaian B. The Effectiveness of Lifestyle-Focused Cognitive Behavioral Therapy versus Semantic Cognitive Restructuring Therapy on Chronic Fatigue in Patients with Irritable Bowel Syndrome. *Journal of Babol University of Medical Sciences*. 2024; 26: e52.

[DOI: 10.22088/jbums.26.1.52]

Introduction

Irritable bowel syndrome is a common functional bowel disorder characterized by frequent abdominal pain associated with bowel movements or changes in bowel habits (1). Abnormal bowel habits can include constipation, diarrhea, or a combination of constipation and diarrhea and symptoms of abdominal bloating and distension. Symptoms occur for at least 6 months and must be present for 3 months prior to diagnosis (2). Ambiguity in the etiology and even diagnosis of this disorder due to different mechanisms and manifestations has led to different treatment approaches for this syndrome (3). In the absence of reliable and valid biological markers for accurate classification of these patients, the diagnosis process is currently carried out according to the symptoms presented by the patient himself/herself, which will lead to the determination of the overall severity of the disease and formulating treatment plans (4). Chronic fatigue is one of the common symptoms of irritable bowel syndrome, which reduces the quality of life of patients, but its exact mechanism is still unknown (5). Chronic fatigue, which is defined as a decrease in physical, mental and cognitive energy and a significant drop in a person's activities, is a complex and debilitating disorder that never goes away with rest and may even worsen with mental and physical activities (6, 7). Patients' understanding of their illness and suffering can affect their mental health and ability to cope with the illness (8). The result of this decline in performance can be seen in social, emotional or emotional dimensions and especially cognitive processes which are very important (9).

When a disease is diagnosed for a person or when a person suffers an injury, he/she tries to form a cognitive schema of the disease to make sense of the disease for himself/herself (10, 11). People with this syndrome often function at a lower level than a healthy person. Among them, fatigue is the most common symptom, which is characterized by severe mental and physical exhaustion and is a factor for reducing 50% of all the activities of the affected person. The reasons for the occurrence and prevalence of chronic fatigue are unclear. Patients with irritable bowel syndrome are one of the high-risk groups for contracting this disease (12). According to studies, 50-90% of patients with irritable bowel syndrome experience a psychological disorder during their lifetime, such as anxiety disorders, especially generalized anxiety disorder, depression, and somatoform disorders (13). The role of factors associated with central nervous system has been particularly noted in the pathogenesis of irritable bowel syndrome, due to the aggravation of symptoms following anxiety and psychological disorders, and the appropriate response to treatments that affect the cerebral cortex (14).

In general, emotions and mental states have a significant effect on the severity of the symptoms of irritable bowel syndrome, and on the other hand, patients with this syndrome experience a lot of negative emotions due to the suffering caused by numerous physical symptoms (15). Cognitive restructuring approaches teach people to examine their assumptions about situations and the world and make their beliefs more realistic and wiser. Irrational thoughts lead to rational behaviors that can be modified by changing the underlying thoughts (16). Problems in life originate from false cognitions, beliefs and thoughts that people develop in different situations (17). Therefore, instead of dealing with external, environmental, genetic, and hereditary factors, cognitive therapists usually focus on reflection, cognitive restructuring, interpretation, and justification and rationalization of a person’s state of mind (18).

According to the protocol proposed in cognitive therapy, the patient under the restructuring therapy learns that many of his/her beliefs about the causative factors of irritable bowel syndrome and their control and prevention methods are irrational and should be considered realistically. Therefore, during the intervention period, people consider themselves more responsible in controlling and treating their disease than before. Considering the cognitive restructuring and living conditions, interactions with others and lifestyle, the source of health related to effective people increases significantly in this method. In their

[DOI: 10.22088/jbums.26.1.52]

research, Alipour et al. confirmed the effectiveness of cognitive restructuring therapy on reducing anxiety (19). The findings of Farid et al. showed that cognitive restructuring intervention can be effective in improving irrational beliefs (20). Kalantari et al. also showed that the cognitive restructuring intervention leads to the reduction of learned helplessness (21). Since the semantic cognitive restructuring method is also derived from cognitive behavioral therapy methods, it is possible to refer to some studies conducted regarding the effectiveness of cognitive behavioral therapy on various variables in communities suffering from irritable bowel syndrome.

Due to the lack of research resources on the effectiveness of lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy in patients with irritable bowel syndrome, this study was conducted to compare the effectiveness of lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy on chronic fatigue in patients with irritable bowel syndrome.

Methods

After being approved by the ethics committee of Islamic Azad University, Sari branch with the code IR.IAU.SARI.REC.1402.025, this cross-sectional study was conducted on 45 patients with irritable bowel syndrome who referred to a private clinic in 2023. The study included three groups (n=15) of lifestyle-focused cognitive behavioral therapy, semantic cognitive restructuring therapy, and a control group that did not receive any cognitive therapy with a pretest-posttest design. Based on Cohen's formula and previous studies (22), the sample size was estimated to be 10 people in each group, and considering the possibility of sample dropout, 15 people were considered in each group. Patients with the diagnosis of irritable bowel syndrome based on the criteria of Rome II (23) with the approval of a gastroenterologist, not receiving psychological treatment in the past three months, and having no history of psychotherapy and taking psychiatric drugs (based on the review of medical records) in the previous 10 years were included. In case of unwillingness to continue, absence of more than 3 sessions in treatment classes, subjects were excluded from the study.

The patients were randomly assigned to the experimental and control groups. Eligible people were studied in one of the three groups by randomization using blocks of six (AABBCC) (Permuted Block Randomization) and eight blocks, and using the website http://www.randomization.com/.

After selecting the samples, the topic, treatment courses, goals and ethical considerations of the research were explained. First, the pre-test was conducted. Pretest, posttest and follow-up after four months were done using Multidimensional Fatigue Inventory (24) with 5 subscales of general fatigue, physical fatigue, reduced activity, reduced motivation, mental fatigue and a score of 0-100, where a score of 20-40 indicates low fatigue, 40-60 indicates moderate fatigue, and a score above 60 indicates high fatigue in the individual. The control group did not receive any psychological treatment. The reliability and validity of the fatigue questionnaire for 5 subscales have been obtained from 0.70 to 0.90 (24).

After making the necessary arrangements and obtaining necessary permits and receiving written consent, people were asked to go to the counseling center and participate in the pre-test. After matching based on gender, education level and age, they were placed in the first, second and control intervention groups. Lifestyle-focused cognitive behavioral therapy group had 8 sessions of 90 minutes virtually (25) (Table 1). For semantic cognitive restructuring therapy group, 12 sessions of 90 minutes and once a week were conducted virtually (26) (Table 2). After the intervention sessions, a post-test was also conducted and after four months, a follow-up was also done.

[DOI: 10.22088/jbums.26.1.52]

Table 1. Treatment protocols for lifestyle-focused cognitive behavioral therapy

Session	Session content
First session	Stress control and lifestyle: introducing the program, providing explanations on lifestyle changes, mental imagery, the importance of self-reliance and recording it, explanations about worksheets
Second session	Principles vs. techniques for understanding response systems and the importance of physical activity: finding the pattern, source and principles of stress, obvious signs of stress, setting logical goals, reviewing and practicing stress response cycle, the importance of physical activity, performing physical activity and recording it
Third session	De-stressing and time management, ABC model, attitudes and the role of social relations: self-talk, challenging destructive and stressful thoughts, the role of emotions and its origin, explanations in the field of logical thinking.
Fourth session	Courage development and the importance of nutrition: reviewing worksheets, explanations about courage, the importance of proper nutrition, stress management, the role of family support and help seeking.
Fifth session	Mental imagery, stress and eating, overcoming negative events, avoiding self-criticism, self-rewarding, following a proper diet, explanations about anger, evaluating physical activity such as walking, etc., and reviewing and solving the problems
Sixth session	Reality test and two-way ladder, attitude traps and problem solving: introducing the test, making a two-way ladder, de-stressing through recall, beliefs related to failure and stress, problem solving
Seventh session	Behavioral chains and the importance of roles: stress as a chain, breaking the chain, reviewing the behavioral chain of patients, determining roles and goals
Eight session	Strengthening oneself against a stressful environment: challenging life events, relapse prevention and control, review and summary of the program

Table 2. Treatment protocol for semantic cognitive restructuring method

Session	Session content
First session	Getting to know the goals and rules of the group: creating communication and empathy
Second session	Identifying thoughts as the causes of discomfort and confusion, identifying the sequence between cognitions and motivations, behaviors, feelings, reminding the rules and recommendations of the group and emphasizing the need to follow them during the course
Third session	Identifying the sequence between cognitions and motivations: providing an example with 3 situations by the counselor to familiarize the members and how to cope with troublesome emotions.
Fourth session	Examining the sequence between cognitions and motivations, examining the evaluation and correction of cognitions: providing information about the role of cognition and introducing the ABC formula.
Fifth session	Reviewing clients' understanding of the results of the ABC model, creating insight in members about the effective role of beliefs (B)

[DOI: 10.22088/jbums.26.1.52]

Sixth session	Measuring automatic thoughts and cognitive distortions provides insight into how people perpetuate confusion by repeating their irrational thoughts.
Seventh session	Creating insight that the repetition of irrational thoughts leads to a person's continued confusion
Eight session	Recognition and tracking of important cognitive errors in thoughts by group members
Ninth session	Recognizing and tracking irrational beliefs
Tenth session	Recognizing and challenging irrational beliefs by playing the role of members, divided into five groups of three and each one was assigned one irrational belief to challenge it after discussion and common understanding to realize why is it irrational?
Eleventh session	Recognizing and challenging irrational beliefs through role playing
Twelfth session	Explanation and review of various insights in references

Then the data were analyzed using SPSS version 26 and the statistical tests of analysis of variance, repeated measures ANOVA and Bonferroni's post hoc, and $p<0.05$ was considered significant.

Results

In this study, 22 women (48.9%) and 23 men (51.1%) participated in an age range of 25-49 years, and the three groups did not differ significantly in terms of age, gender, education and marital status (Table 3). The findings showed that lifestyle-focused cognitive behavioral therapy with a score of (53.53±11.12) and semantic cognitive restructuring therapy with a score of (60.40±14.57) in the post-test, and with scores (55.80±11.68 and 59.72±14.94, respectively) in the follow-up after four months were effective on chronic fatigue in patients with irritable bowel syndrome ($p<0.05$). These two intervention groups had significant differences with the control group (64.53±15.70 and 64.46±15.77), respectively ($p<0.05$) (Table 4).

Table 3. Comparison of demographic characteristics of the three study groups

Demographic variables	Lifestyle-focused cognitive behavioral therapy Number(%)	Semantic cognitive restructuring therapy Number(%)	Control Number(%)	p-value
Gender				
Female	6(40)	12(80)	4(26.7)	0.33
Male	9(60)	3(20)	11(73.3)	
Marital status				
Single	0(0)	0(0)	1(6.7)	1.00
Married	15(100)	15(100)	14(93.3)	
Age				
Below 30	1(6.7)	5(3.33)	0(0)	
30-39	10(66.7)	4(26.7)	10(66.7)	0.43
40-49	4(26.7)	6(40)	5(33.3)	
Education				
Illiterate	1(6.7)	0(0.0)	0(0.0)	
Lower than diploma	11(73.3)	14(93.3)	14(93.3)	0.08
Associate degree	2(13.3)	0(0.0)	0(0.0)	
Bachelor	1(6.7)	1(6.7)	1(6.7)	

[DOI: 10.22088/jbums.26.1.52]

Table 4. Comparison of chronic fatigue score in three groups of lifestyle-focused cognitive behavioral therapy, semantic cognitive restructuring therapy and control group before and after the intervention

Group / Variable	Pretest* Mean±SD	Posttest* Mean±SD	Follow-up* Mean±SD
Chronic fatigue			
Cognitive-behavioral	65.86±14.76	53.53±11.12	55.80±11.68
Cognitive restructuring	66.58±16.36	60.40±14.57	59.72±14.94
Control	65.11±15.59	64.53±15.70	64.46±15.77

*p<0.05

The results show that the analysis of variance is significant for the intragroup factor (time) with an effect size of 73% and intergroup with an effect size of 76%. These results mean that considering the group effect, the effect of time alone is significant. Also, the interaction between group and time was significant (p=0.001) (Table 5). The mean chronic fatigue in the combined treatment group (cognitive-behavioral and cognitive restructuring) at the end of the post-test was lower than the control group (p<0.01). In addition, in terms of effectiveness, cognitive behavioral therapy had a higher impact on research variables compared to cognitive restructuring therapy. The mean chronic fatigue in the combined treatment group (cognitive-behavioral and cognitive restructuring) at the end of the post-test was lower than the control group (p<0.01) (Table 6).

Table 5. Repeated measures ANOVA to compare the pre-test, post-test of chronic fatigue in experimental and control groups

Scale and source of effect	Sum of squares	Degree of freedom	Mean square	F	p-value	Eta squared
Chronic fatigue						
Time	230.46	1.43	160.14	79.16	0.001	0.73
Time*group	150.02	1.43	104.24	51.53	0.001	0.64
Group	284.57	2	142.28	29.77	0.001	0.76

Table 6. Bonferroni's post hoc test results to compare research variables

Variable	Group	Subgroup	Mean difference	p-value
Chronic fatigue	Cognitive-behavioral	Cognitive restructuring	-7.17	0.001
		Control	-9.97	0.001
	Cognitive restructuring	Control	-4.79	0.001

Discussion

The results of this study showed that lifestyle-focused cognitive behavioral therapy has a higher effect on chronic fatigue compared to semantic cognitive restructuring therapy in patients with irritable bowel syndrome. The results of this study are consistent with the findings of Mafakheri et al. (27), Pak Andish et al. (28), Mosayebi et al. (29), Babahasani et al. (30) and Shareh et al. (31). In explaining this finding, it can be said that worldwide health services tend towards patient-centered methods, and the basis of this work is the participation of patients in improving their own health. In their research, Sharma et al. confirmed the cognitive restructuring therapy based on a focus on health control and self-care (32). Focht et al. in a research entitled "the effectiveness of lifestyle-focused cognitive behavioral therapy on social cognitive outcomes" showed that the intervention leads to a significant improvement in chronic fatigue,

[DOI: 10.22088/jbums.26.1.52]

self-efficacy and satisfaction with one's performance (33). The results of the study showed that teaching a healthy lifestyle in a cognitive-behavioral way leads to self-management behaviors that are associated with disease control and symptom improvement. The results of this study also showed that cognitive-behavioral therapy has a higher effect on chronic fatigue compared to cognitive restructuring therapy. The results of this study are in line with the findings of Alipour et al. (19), Pak Andish et al. (28), Shareh et al. (31), Addison et al. (34).

In explaining the greater effectiveness of lifestyle-focused cognitive behavioral therapy compared to semantic cognitive restructuring therapy in patients with irritable bowel syndrome, it can be said that physicians do not emphasize enough on lifestyle-focused cognitive behavioral therapy in this disease. Usually, the educational needs of these patients are not considered by physicians (35). Since all the emotional and psychological problems of patients with irritable bowel syndrome arise from mental errors, cognitive distortions and ineffective and irrational beliefs, physicians' attention to their patients' beliefs and their identification of health obstacles can have a significant effect on increasing the probability of successful treatment. Considering the current educational situation, a lot of effort is needed to increase the information of patients. Irritable bowel syndrome is a major health and social problem whose dimensions are expanding rapidly. Rapid economic and social changes in recent decades have caused the prevalence of risk factors for irritable bowel syndrome to increase significantly (36).

The present research was also faced with limitations. The use of non-random sampling method was the most important limitation of this research. Also, the use of a questionnaire, which is a self-reporting tool, creates the possibility of bias in the responses of the subjects. Moreover, limiting the research community to all patients with irritable bowel syndrome in Babol in 2023, which limits the generalization of the results to people with irritable bowel syndrome in other regions and cities and even other diseases. It is suggested to use random sampling methods in future studies in order to generalize the results better. The research should be conducted on men and women suffering from other diseases and treatment centers in other cities and compare the results with the results of the present study so that the generalization and effectiveness of the results can be discussed more accurately and confidently. Considering that the current study is a quantitative research, it is suggested to use a qualitative research (grounded theory based on semi-structured interviews) in future studies. Also, considering the effectiveness of lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy on chronic fatigue in patients with irritable bowel syndrome, it is suggested that clinical psychologists and therapists use lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy in their interventions, especially in regard with the mentioned variables. Regarding the effectiveness of lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy on improving chronic fatigue in patients with irritable bowel syndrome, counselors and other therapists are advised to explore elements of lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy in their clinical interview and etiological analysis of clients' problems. They should also increase the effectiveness of their treatment method and provide efficient strategies by recognizing inefficient strategies.

Acknowledgment

Hereby, we would like to thank the Deputy of Research and Technology of Islamic Azad University, Sari Branch, for supporting this research and also Dr. Mohammad Saleki for allowing us to perform the research on his patients.

[DOI: 10.22088/jbums.26.1.52]

References

1.Black CJ, Ford AC. Global burden of irritable bowel syndrome: trends, predictions and risk factors. Nat Rev Gastroenterol Hepatol. 2020;17(8):473-86.
2.Vasant DH, Paine PA, Black CJ, Houghton LA, Everitt HA, Corsetti M, et al. British Society of Gastroenterology guidelines on the management of irritable bowel syndrome. Gut. 2021;70(7):1214-40.
3.Chong PP, Chin VK, Looi CY, Wong WF, Madhavan P, Yong VC. The Microbiome and Irritable Bowel Syndrome - A Review on the Pathophysiology, Current Research and Future Therapy. Front Microbiol. 2019;10:1136.
4.Kim YS, Kim N. Sex-Gender Differences in Irritable Bowel Syndrome. J Neurogastroenterol Motil. 2018;24(4):544-58.
5.Sotzny F, Blanco J, Capelli E, Castro-Marrero J, Steiner S, Murovska M, et al. Myalgic Encephalomyelitis/Chronic Fatigue Syndrome - Evidence for an autoimmune disease. Autoimmun Rev. 2018;17(6):601-9.
6.Wong TL, Weitzer DJ. Long COVID and Myalgic Encephalomyelitis/Chronic Fatigue Syndrome (ME/CFS)-A Systemic Review and Comparison of Clinical Presentation and Symptomatology. Medicina (Kaunas). 2021;57(5):418.
7. Kim YJ, Lee SG, Lee JS, Choi YJ, Son CG. Comparative characteristics of fatigue in irritable bowel syndrome and inflammatory bowel disease: A systematic review and meta-analysis. J Psychosom Res. 2024;177:111589.
8. Koloski N, Shah A, Kaan I, Ben Jacob R, Talley NJ, Jones MP, et al. Healthcare Utilization Patterns: Irritable Bowel Syndrome, Inflammatory Bowel Disease, and Gastroesophageal Reflux Disease. Dig Dis Sci. 2024;69(5):1626-35.
9.Tattan M, Ørnbøl E, Wellnitz KB, Hanssen DJC, Dantoft TM, Rosmalen JGM, et al. Factors associated with having previously received a diagnosis of fibromyalgia, chronic fatigue syndrome and irritable bowel syndrome: A cross sectional DanFunD study. J Psychosom Res. 2024;181:111693.
10.Brenner DM, Sharma A, Rao SSC, Laitman AP, Heimanson Z, Allen C, et al. Plecanatide Improves Abdominal Bloating and Bowel Symptoms of Irritable Bowel Syndrome with Constipation. Dig Dis Sci. 2024;69(5):1731-8.
11.Nybacka S, Törnblom H, Josefsson A, Hreinsson JP, Böhn L, Frändemark Å, et al. A low FODMAP diet plus traditional dietary advice versus a low-carbohydrate diet versus pharmacological treatment in irritable bowel syndrome (CARIBS): a single-centre, single-blind, randomised controlled trial. Lancet Gastroenterol Hepatol. 2024;9(6):507-20.
12.Lim EJ, Ahn YC, Jang ES, Lee SW, Lee SH, Son CG. Systematic review and meta-analysis of the prevalence of chronic fatigue syndrome/myalgic encephalomyelitis (CFS/ME). J Transl Med. 2020;18(1):100.
13.Simpson CA, Mu A, Haslam N, Schwartz OS, Simmons JG. Feeling down? A systematic review of the gut microbiota in anxiety/depression and irritable bowel syndrome. J Affect Disord. 2020;266:429-46.
14.Le Morvan de Sequeira C, Kaeber M, Cekin SE, Enck P, Mack I. The Effect of Probiotics on Quality of Life, Depression and Anxiety in Patients with Irritable Bowel Syndrome: A Systematic Review and Meta-Analysis. J Clin Med. 2021;10(16):3497.
15.Porcelli P, De Carne M, Leandro G. Distinct associations of DSM-5 Somatic Symptom Disorder, the Diagnostic Criteria for Psychosomatic Research-Revised (DCPR-R) and symptom severity in patients with irritable bowel syndrome. Gen Hosp Psychiatry. 2020;64:56-62.
16.Asikhia OA. Effect of Cognitive restructuring on the reduction of Mathematics anxiety among senior secondary school students in Ogun State, Nigeria. Int J Educ Res. 2014;2(2):1-20.
17.Kranke D, Weiss EL, Gin J, Der-Martirosian C, Brown J, Saia R, et al. A “culture of compassionate bad asses”: A qualitative study of combat veterans engaging in peer-led disaster relief and utilizing cognitive restructuring to mitigate mental health stigma. Best Pract Ment Health. 2017;13(1):20-33.
18.Ashrafi M, Jomehri F, Niknam M, Rafieipour A. Effects of Cognitive Restructuring on Health Control and Self-Care in Women With Hypertension. Middle Eastern J Disabil Stud (MEJDS). 2020;10:191. [In Persian]

[DOI: 10.22088/jbums.26.1.52]

19.Alipour A, Rezai A, Hashemi T, Yousefpour N. The effectiveness of cognitive behavioral therapy focused on lifestyle modification to increase monitoring vital signs and coronary heart disease and psychological well-being. Health Psychol. 2017;5(20):125-36. [In Persian]
20.Farid A, Habibi-Kaleybar R, Moshtary E Sahneh B. Comparison of the Effectiveness of Play Therapy and Neurofeedback on the Executive Functions of Primary School Female Students with Learning Disabilities. J Psychol Exceptional Individuals. 2021;11(43):175-206. [In Persian]
21.Kalantari M, Molavi H, Jafari D. The effectiveness of cognitive restructuring training on reducing the learned helplessness of male students of Hamadan, cognitive science news. Adv Cogn Sci. 2001;3(4):10-5. [In Persian] Available from: https://icssjournal.ir/article-1-683-fa.pdf
22.Stemmet CL. Perceptions and experiences of nurses about the mobile clinic work environment [MSc thesis]. South Africa, Stellenbosch: Stellenbosch University, Faculty of Health Sciences; 2016. Available from: https://core.ac.uk/download/188223604.pdf
23.North CS, Hong BA, Alpers DH. Relationship of functional gastrointestinal disorders and psychiatric disorders: implications for treatment. World J Gastroenterol. 2007;13(14):2020-7.
24.Schulz R, Monin JK, Czaja SJ, Lingler JH, Beach SR, Martire LM, et al. Measuring the experience and perception of suffering. Gerontologist. 2010;50(6):774-84.
25.Barlow DH, Rapee RM, Reisner LC. Mastering Stress. American Health Publishing Company; 2001. p. 451-2.
26.Amani A, Hadi M, Yoosefi N. The Effectiveness of Adlerian Group Counseling on Marital Disturbance and Interpersonal Conflict of Couples. Biannual J Appl Couns. 2018;8(2):73-92. [In Persian]
27.Mafakheri A, Khorrami M, Kaviyani F, Ashrafifard S. Effectiveness of Cognitive-Behavioral Therapy on Cognitive Strategies of Emotional Regulation and General Self-Efficacy among Mothers of Children with Cerebral Palsy. Q J Health Psychol. 2022;11(42):85-100. [In Persian]
28.Pak Andish Sh, Kraskian A, Jamhari F. Determining the Effectiveness of Cognitive-Behavioral Therapy in Regulating Emotion and Mental Health of Obese Women. Iran J Nurs Res (IJNR). 2021;16(2):59-68. [In Persian]
29.Mosayebi M, Ghanadzadegan H, Mirzaian B. Comparison of the Effectiveness of Semantic Cognitive Reconstruction Therapy and Self-Encouragement Therapy on Chronic Fatigue in People with Psychosomatic Skin. Rooyesh-e-Ravanshenasi J (RRJ). 2021;10(9):193-204. [In Persian]
30.Babahasani Kh, Amini N, Shafieabadi A, Deyreh E. Effectiveness of Existential Group Therapy on Experience and Perception of Suffering, Emotional Regulation and Happiness in Migraine patients. J Soc Psychol. 2021;9(58):295-309. [In Persian]
31.Shareh H, Robati Z. Effect of Cognitive-Behavioral Group Therapy on Pain Self-efficacy, Fatigue, Life Expectancy and Depression in Patients With Multiple Sclerosis: A Randomized Controlled Clinical Trial. Iran J Psychiat Clin Psychol. 2021;26(4):418-31. [In Persian]
32.Sharma A, Rushton K, Lin IW, Nguyen T, Althoff T. Facilitating Self-Guided Mental Health Interventions Through Human-Language Model Interaction: A Case Study of Cognitive Restructuring. In: CHI '24: Proceedings of the CHI Conference on Human Factors in Computing Systems. Honolulu, HI, USA: 2024. p.1-29.
33.Focht BC, Lucas AR, Grainger E, Simpson C, Fairman CM, Thomas-Ahner JM, et al. Effects of a Group-Mediated Cognitive Behavioral Lifestyle Intervention on Select Social Cognitive Outcomes in Prostate Cancer Patients Undergoing Androgen Deprivation Therapy. Integr Cancer Ther. 2019;18:1534735419893764.
34.Addison S, Shirima D, Aboagye-Mensah EB, Dunovan SG, Pascal EY, Lustberg MB, et al. Effects of tandem cognitive behavioral therapy and healthy lifestyle interventions on health-related outcomes in cancer survivors: a systematic review. J Cancer Surviv. 2022;16(5):1023-46.

[DOI: 10.22088/jbums.26.1.52]

35.Pan Y, Liu HY, Zhong S. Effect of cognitive behavior therapy (CBT) on lowering of blood glucose levels in gestational diabetes mellitus (GDM) patients: study protocol for a prospective, open-label, randomized controlled trial. Trials. 2023;24(1):26.
36.Reynolds AC, Sweetman A, Crowther ME, Paterson JL, Scott H, Lechat B, et al. Is cognitive behavioral therapy for insomnia (CBTi) efficacious for treating insomnia symptoms in shift workers? A systematic review and meta-analysis. Sleep Med Rev. 2023;67:101716.

[DOI: 10.22088/jbums.26.1.52]