KMANPUB | Health Nexus Vol. 2 No. 3 (2024): 34-41

Article history:
Received 16 February 2024
Revised 20 April 2023
Accepted 12 May 2024
Published online 01 July 2024

Comparison of the Effectiveness of Lifestyle-Focused Cognitive Behavioral Therapy and Semantic Cognitive Restructuring Therapy on Pain Perception in Patients with Irritable Bowel Syndrome

Mozhgan Akbari Ebtekar[1], Seyedeh Olia Emadian[2*], Bahram Mirzaian[3]

[1] PhD in Psychology, Department of Psychology, Faculty of Humanities, Islamic Azad University: Sari Branch, Iran
[2] Department of Psychology, Sari Branch, Islamic Azad University, Sari, Iran
[3] Assistant Professor, Department of Psychology, Sari Branch, Islamic Azad University, Sari, Iran

*** Corresponding author email address**: emadian2012@yahoo.com

A r t i c l e I n f o

Article type:
Original Research

How to cite this article:
Akbari Ebtekar, M., Emadian, S. O., & Mirzaian, B. (2024). Comparison of the Effectiveness of Lifestyle-Focused Cognitive Behavioral Therapy and Semantic Cognitive Restructuring Therapy on Pain Perception in Patients with Irritable Bowel Syndrome. *Health Nexus*, *2*(3), 34-41.
https://doi.org/10.61838/kman.hn.2.3.5

A B S T R A C T

This study aimed to compare the effectiveness of lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy on pain perception in patients with irritable bowel syndrome. This quasi-experimental study utilized a pretest-posttest-follow-up design with a control group. The statistical population included all patients with irritable bowel syndrome in Babol city in 2023, selected through convenience sampling and randomly assigned to two experimental groups and one control group. Data were collected using the Pain Perception Scale developed by Schallz et al. (2010). The lifestyle-focused cognitive behavioral therapy group received eight 90-minute sessions, while the semantic cognitive restructuring therapy group received twelve 90-minute sessions, both conducted once a week. The control group did not receive any intervention. Data analysis was performed using a mixed design with repeated measures and SPSS-26 software. The results indicated that both lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy were effective in reducing pain perception in patients with irritable bowel syndrome ($P < 0.05$). Moreover, lifestyle-focused cognitive behavioral therapy had a higher impact on reducing pain perception compared to semantic cognitive restructuring therapy in patients with irritable bowel syndrome. The present study demonstrated that lifestyle-focused cognitive behavioral therapy and semantic cognitive restructuring therapy are effective in reducing pain perception in patients with irritable bowel syndrome. Therefore, these approaches can be utilized alongside medical interventions in treatment centers for such individuals.

Keywords: *Lifestyle-Focused Cognitive Behavioral Therapy, Semantic Cognitive Restructuring Therapy, Pain Perception, Irritable Bowel Syndrome*

1. Introduction

Irritable bowel syndrome (IBS) is one of the most common gastrointestinal disorders characterized by chronic abdominal pain and altered bowel habits in the absence of any organic disorder, diagnosed by gastroenterologists and health care providers. The General Medical Center of England estimates that at least eight patients with irritable bowel syndrome visit a doctor in a week (1). In previous decades, irritable bowel syndrome (IBS) was not as prevalent as it is today, with most studies reporting a twofold higher prevalence in women compared to men. The involvement of psychosocial stressors and emotional factors in the predisposition, onset, and persistence of symptoms is suggested. The prevalence of this disorder is 10-15% in Western societies (2) and 6% in the Iranian population (3).

A significant portion of the population suffers from the symptoms of irritable bowel syndrome. Suffering is an ambiguous experience in life and an endless struggle to maintain health or achieve control. Suffering is an unpleasant feeling that ranges from psychological and physical discomfort to severe grief, with stages from malignant despair to the final stage of indifference and emotional numbness. Suffering occurs when imminent destruction is perceived by an individual and continues as long as the damage exists or until the individual's integrity is restored through various means. Although suffering is often manifested as physical symptoms, it is more than that. Suffering is influenced by two factors: the duration and its pathological nature. Suffering lasting less than six months is considered acute, and more than that is chronic. Acute suffering is caused by an environmental factor, such as a bone fracture that causes sudden pain. Chronic suffering can be persistent or intermittent (e.g., migraines). Unlike acute suffering, in chronic cases, the cause of suffering may be unknown. Pain and suffering are two separate mental phenomena that follow a sequence and affect various human dimensions, including physical, cognitive, emotional, interpersonal, socio-cultural, and psychological aspects of the experiencing individual, family members, and professional health service providers (4).

One of the therapeutic methods used to improve patients with irritable bowel syndrome is cognitive-behavioral therapy (CBT). CBT is essentially an approach widely supported both theoretically and empirically for the treatment of a broad range of psychological disorders (Apolinário-Hagen, Drüge, & Fritsche, 2020). In this approach, cognitive and behavioral methods focused on lifestyle are used together, emphasizing the identification of incorrect, negative, and irrational beliefs affecting patients' emotions and behaviors, and correcting these underlying beliefs using cognitive and behavioral techniques (5). CBT can be applied in both individual and group therapy settings with good results (6). Since 1945, pioneers such as Beck and Ellis have laid the foundation for this approach. Ellis described rational-emotional therapy, believing that emotional and psychological disorders largely result from irrational and illogical thinking, and that increasing rational thinking and reducing irrational thinking can free individuals from many psychological disorders.

Cognitive restructuring activities are conducted in many CBT treatments for adults, and fundamental elements of these activities are also used with children and adolescents. There are various types of cognitive restructuring methods, all of which help the client become aware of self-talk, expectations, or beliefs reflecting ineffective ways of thinking about themselves, others, and the future. Then, the therapist guides the client to understand the relationship between these negative beliefs and their emotional experiences, and finally, the therapist and client collaborate in various ways to identify, create, and evaluate strategies for developing adaptive thoughts (7). Cognitive restructuring is a systematic and rapidly growing strategy through which clients are taught to replace their negative and debilitating thoughts with positive and logical ones. The following assumptions are made in this approach: 1- Self-defeating behaviors arise from defective cognitive distortions or irrational thoughts and self-talks that have a self-defeating nature. 2- Clients can change their defective thinking and self-defeating self-talks (8).

The goal of metaphor-based cognitive restructuring is to change emotional beliefs (content) alongside rational beliefs (meaning). Cognitive therapists primarily emphasize cognitive restructuring, teaching individuals to review their faulty cognitive schemas. When the content (emotional beliefs) cannot be expressed in words, metaphors, stories, parables, and poetry, which convey the essence of an incident, are used (9). Research on cognitive emotion regulation strategies and self-efficacy in patients with

Health Nexus
E-ISSN: 2981-2569

cerebral palsy (10), emotion regulation and psychological health in obese women (11), health-related outcomes in cancer survivors (12), and polycystic syndrome (13) have shown the effectiveness of lifestyle-focused cognitive-behavioral therapy.

Although the prevalence of this disease is low, the pain and suffering caused by this disease engage the patient for many years, affecting their quality of life, and therefore, it imposes a significant burden on society both directly and indirectly. Given that comprehensive and population-based studies on this issue are scarce, the present study aimed to compare the effectiveness of lifestyle-focused cognitive-behavioral therapy and semantic cognitive restructuring therapy on the perception of suffering in patients with irritable bowel syndrome.

2. Methods and Materials

2.1. Study Design and Participants

This study is quasi-experimental research (pre-test, post-test, and follow-up design with a control group) with the ethics code IR.IAU.SARI.1402.025. The statistical population of this study included all patients with irritable bowel syndrome in Babol in 2023 who had referred to treatment centers. Using a convenience sampling method, 45 participants were selected and randomly assigned into three groups of 15 each and underwent a pre-test. Then, with ethical considerations in place, the first experimental group received lifestyle-focused cognitive-behavioral therapy in eight 90-minute weekly sessions, the second experimental group received semantic cognitive restructuring therapy in twelve 90-minute weekly sessions, and the control group did not receive any intervention. After the treatment period, all three groups underwent a post-test, and a follow-up test was conducted four months later. The inclusion criteria were the diagnosis of irritable bowel syndrome confirmed by a gastroenterologist, no psychological treatments in the past three months, no history of psychotherapy, and no use of psychiatric drugs in the past ten years. The exclusion criteria were unwillingness to continue participation and more than three absences from therapy sessions.

2.2. Measures

2.2.1. Pain Perception

This scale was designed by Schallz et al. (2010). The Pain Perception Scale measures the absence of suffering in three dimensions: physical suffering, psychological suffering, and existential/spiritual suffering. The physical dimension is measured by 15 items, the psychological dimension by 15 items, and the existential/spiritual dimension by 1 item. Participants respond to the scale using a four-point Likert scale ranging from never (0) to always (3). The reliability of this scale and its dimensions was confirmed by Schallz et al. in three groups: African-Americans (physical 0.43, psychological 0.90, existential/spiritual 0.86), Whites (physical 0.43, psychological 0.87, existential/spiritual 0.84), and Hispanics (physical 0.60, psychological 0.87, existential/spiritual 0.83). This scale measures the scores of the dimensions of suffering (14).

2.3. Intervention

2.3.1. Lifestyle-Focused Cognitive Behavioral Therapy

The lifestyle-focused cognitive behavioral therapy protocol (15) consisted of eight 90-minute weekly sessions.

Session 1: The first session introduces the stress management and lifestyle approach. The program is outlined, explaining the importance of lifestyle changes. Techniques such as mental imagery are discussed, and the significance of self-monitoring and recording these changes is emphasized. The use of worksheets is also introduced.

Session 2: This session differentiates between principles and techniques, focusing on understanding response systems and the importance of physical activity. Participants identify patterns, sources, and principles of stress, recognize prominent stress symptoms, and set realistic goals. Homework involves reviewing the stress response cycle and incorporating physical activity, which they will log.

Session 3: This session covers relaxation and time management, the ABC model, attitudes, and the role of social relationships. Participants learn about self-talk, challenging destructive and stress-inducing thoughts, and understanding the origin and role of emotions. Rational thinking is explained in detail.

Health Nexus
E-ISSN: 2981-2569

Session 4: Assertiveness and the importance of nutrition are the main topics. Worksheets are reviewed, and assertiveness is discussed alongside the benefits of proper nutrition. Stress management techniques, family support, and seeking help are also covered.

Session 5: This session addresses mental imagery, stress and eating, overcoming negative events, avoiding self-criticism, self-reward, and following a proper diet. Discussions include anger management, evaluating physical activities like walking, and solving problems.

Session 6: Reality testing and the double-sided ladder are introduced. Participants learn about constructing a double-sided ladder, reducing tension through recall, beliefs related to failure and stress, and problem-solving.

Session 7: Behavioral chains and the importance of roles are discussed. Stress is presented as a chain, and participants learn to break the chain. Behavioral chains are reviewed, roles are assigned, and goals are set.

Session 8: Self-empowerment in stressful environments is the focus. Participants discuss challenging life events, relapse prevention, and control. The session concludes with a review and summary of the program.

2.3.2. Semantic Cognitive Restructuring Therapy

The semantic cognitive restructuring therapy protocol (16) consisted of twelve 90-minute weekly sessions.

Session 1: The first session focuses on familiarizing participants with the group's goals and rules, fostering connection and empathy.

Session 2: This session identifies thoughts as causes of distress and confusion and examines the sequence among cognitions, motivations, behaviors, and emotions. Group rules and recommendations are reiterated, emphasizing their importance throughout the course.

Session 3: The sequence among cognitions and motivations is explored further. The counselor provides an example involving three scenarios to help members understand and cope with distressing emotions.

Session 4: Participants review, evaluate, and correct cognitions. Information on the role of cognition is provided, and the ABC formula is introduced.

Session 5: The understanding of the ABC model's results is revisited. Insight into the significant role of beliefs (B) is developed.

Session 6: Automatic thoughts and cognitive distortions are assessed. Participants gain insight into how repeating irrational thoughts perpetuates distress.

Session 7: Further insight is provided into how repeating irrational thoughts perpetuates individual distress.

Session 8: This session focuses on recognizing and tracking significant cognitive errors in participants' thoughts.

Session 9: Participants identify and track irrational beliefs.

Session 10: The group challenges irrational beliefs through role-playing. Members are divided into five groups of three, each assigned an irrational belief to discuss, understand, and challenge why it is irrational.

Session 11: Continued identification and challenging of irrational beliefs through role-playing.

Session 12: The final session reviews and consolidates various insights developed during therapy, summarizing the progress and understanding gained by participants.

2.4. Data Analysis

Data analysis was performed using a mixed design with repeated measures and SPSS-26 software.

3. Findings and Results

In the present study, there were 6 women (40%) and 9 men (60%) in the lifestyle-focused cognitive-behavioral therapy group, 12 women (80%) and 3 men (20%) in the semantic cognitive restructuring group, and 4 women (26.7%) and 11 men (73.3%) in the control group. Regarding marital status, there were 15 married individuals in the lifestyle-focused cognitive-behavioral therapy group, 15 married individuals in the semantic cognitive restructuring group, and 1 single and 14 married individuals in the control group. In terms of age, 1 person was under 30 years, 10 people were between 30 and 39 years, and 4 people were between 40 and 49 years in the lifestyle-focused cognitive-behavioral therapy group; 5 people were under 30 years, 4 people were between 30 and 39 years, and 6 people were between 40 and 49 years in the semantic cognitive restructuring group; and 10 people were between 30 and 39 years and 5 people were between 40 and 49 years in the control group. In terms of education, 1 person was illiterate, 11 people had less than a high school diploma, 2 had an associate degree, and 1 had a bachelor's degree in the

Health Nexus
E-ISSN: 2981-2569

lifestyle-focused cognitive-behavioral therapy group; 14 people had less than a high school diploma and 1 had a bachelor's degree in the semantic cognitive restructuring group; and 14 people had less than a high school diploma and 1 had a bachelor's degree in the control group.

Table 1

Central and Dispersion Indices of Pain Perception Scores in the Two Experimental and Control Groups

Variable	Group	Pre-test Mean (SD)	Post-test Mean (SD)	Follow-up Mean (SD)
Pain Perception	Cognitive-Behavioral	23.66 (4.29)	15.60 (3.18)	16.06 (3.38)
	Cognitive Restructuring	25.33 (5.23)	21.73 (4.27)	20.33 (4.54)
	Control	24.73 (6.27)	23.20 (6.26)	23.80 (6.20)

To examine the assumption of normality, the Shapiro-Wilk test was used. The results show that the obtained z-score for pain perception is not significant at the 0.05 level. Therefore, it can be concluded that the distribution of data related to the research hypotheses is normal, and the assumption of normality of the data is met. The F value from Levene's test for equality of variances for the variable of pain perception is not significant at the 0.05 level. Therefore, the null hypothesis is not rejected, and the test is not significant, indicating no significant difference between the variances of the research variables' scores in the two experimental and control groups. Hence, the assumption of equal variances (homogeneity) of the scores in the two experimental and control groups is confirmed, and the assumption of homogeneity of variances is met. To examine the assumption of homogeneity of covariances of the dependent variable (post-test scores) and (follow-up scores) in the two studied groups, the Box's M test was used, which showed that the assumption of homogeneity of covariances in pain perception is established. The significance levels of all tests are significant at the 0.001 level, indicating that there is a significant difference in the effectiveness of lifestyle-focused cognitive-behavioral therapy and semantic cognitive restructuring therapy on improving pain perception. It is noteworthy that Wilks' lambda test with a value of 0.14 and F-test of 79.40 shows a significant difference between the effectiveness scores of cognitive-behavioral therapy on improving pain perception in the two experimental and control groups at the 0.001 significance level.

Table 2

Repeated Measures ANOVA for Comparing Pre-test and Post-test Pain Perception in the Experimental and Control Groups

Scale	Source of Effect	Sum of Squares	df	Mean Square	F	Significance	Eta Squared
Pain Perception	Time	67.28	1.46	46.46	160.63	0.001	0.85
	Time * Group	47.02	1.46	32.21	111.36	0.001	0.79
	Group	61.35	2	30.67	50.49	0.001	0.72

The results in Table 2 indicate that the analysis of variance for the within-group factor (time) and the between-group factor is significant. These results mean that the effects of time and group are significant. The interaction between group and time is also significant. Additionally, for pairwise comparisons of the groups, the Bonferroni post hoc test was used.

Table 3

Results of the Bonferroni Post Hoc Test

Variable	Group	Group	Mean Difference	Significance
Pain Perception	Cognitive-Behavioral	Cognitive Restructuring	-6.74	0.001
		Control	-8.33	0.001
	Cognitive Restructuring	Control	-2.58	0.011

Health Nexus
E-ISSN: 2981-2569

The results in Table 3 show that in terms of effectiveness, lifestyle-focused cognitive-behavioral therapy had a higher impact on the research variables compared to cognitive restructuring therapy ($p < 0.01$).

4. Discussion and Conclusion

The aim of the present study was to compare the effectiveness of lifestyle-focused cognitive-behavioral therapy and semantic cognitive restructuring therapy on pain perception in patients with irritable bowel syndrome. The results of this study were consistent with the prior findings (6, 7, 13, 15, 17-20). This finding can be explained by noting that worldwide health services are increasingly leaning toward patient-centered methods, which involve patients in improving their own health. Lifestyle-focused cognitive-behavioral therapy provides a method in which the patient plays a central role in health promotion, disease prevention, and the successful management of their illness, offering a health care method where the patient takes a pivotal role in enhancing their health. It also refers to the individual's abilities to control symptoms, treatment, physical outcomes, and psychosocial effects, especially in chronic diseases like irritable bowel syndrome, and to manage the inseparable lifestyle changes (19).

According to Pan, Liu, and Zhong (2023), lifestyle-focused cognitive-behavioral therapy is a strategy that helps individuals maintain their behavior sequence, increase a positive behavior or skill, or decrease an inappropriate behavior (13). When successful, individuals will perceive the necessity of changing their behavior or lifestyle (16). Lifestyle-focused cognitive-behavioral therapy may be the best method for convincing patients with irritable bowel syndrome to make behavioral changes and adhere to medication over a long period. The sessions of lifestyle-focused cognitive-behavioral therapy, one of whose goals is to accept mistakes and the courage to accept being imperfect, as well as how one can create positive relationships with oneself and others, helped patients with irritable bowel syndrome to improve their pain perception. Both treatments were beneficial, but lifestyle-focused cognitive-behavioral therapy was found to be more effective. This may be due to identifying and examining the thoughts of patients with irritable bowel syndrome as causes of distress and recognizing the sequence among their cognitions, motivations, behaviors, and feelings (21).

There is a difference between the effectiveness of lifestyle-focused cognitive-behavioral therapy and semantic cognitive restructuring therapy on pain perception in patients with irritable bowel syndrome. The findings show that lifestyle-focused cognitive-behavioral therapy had a greater impact on pain perception compared to semantic cognitive restructuring therapy. These findings are consistent prior studies (10-12, 22). This can be explained by the specific conditions created by irritable bowel syndrome, which cause difficulties in the patients' adaptation in later life. Today, pain perception is recognized as a predictor of the outcomes of irritable bowel syndrome, and improving it is one of the major challenges of the healthcare system. By identifying modifiable risk factors in the progression of the disease, the pain perception of patients can be improved. The physical and psychological disorders associated with irritable bowel syndrome cause pain perception, and interventions that control these issues and symptoms will improve pain perception in patients with irritable bowel syndrome (11).

The physical and psychological disabilities caused by irritable bowel syndrome are of great importance to society, and necessary support should be provided to those who face physical, psychological, and social challenges due to the disability caused by the disease. By educating and challenging negative thoughts and attitudes, pain perception and mood in these individuals can be improved (23). A high mood significantly influences pain perception (21). Semantic cognitive restructuring therapy is a method that involves reviewing and reconstructing thinking, helping to identify and confront cognitive errors, irrational beliefs, cognitive distortions, and automatic thoughts. One of the goals of lifestyle-focused cognitive-behavioral therapy is to accept mistakes and the fact that one is imperfect, as well as how to create positive relationships with oneself and others, which helps patients with irritable bowel syndrome to improve their pain perception (18). Evaluating pain perception shows the impact of the disease and treatment on the lives of patients with irritable bowel syndrome and determines which areas of their lives are most affected by the disease, which is crucial for physicians and health policy makers.

Health Nexus
E-ISSN: 2981-2569

The crises caused by irritable bowel syndrome lead to imbalances and disharmony in thought, body, and mind. The most common states during this period for patients with irritable bowel syndrome are feelings of despair and anxiety (17). Irritable bowel syndrome affects emotional, cognitive, and physiological aspects, but patients can significantly alleviate related issues with beneficial psychological treatments such as semantic cognitive restructuring therapy and lifestyle-focused cognitive-behavioral therapy by adopting appropriate coping strategies. Both treatments were beneficial, but lifestyle-focused cognitive-behavioral therapy was found to be more effective. The results of this study also indicate the effectiveness of teaching a healthy lifestyle using cognitive-behavioral methods in reducing negative psychological components. Considering the role of these factors in the onset, persistence, and worsening of irritable bowel syndrome and lack of follow-up treatment, it seems that it is time to complement drug and hospital treatments with other effective methods, such as familiarizing patients with healthy lifestyle practices, identifying psychological risk factors for their disease, and teaching coping strategies.

Like any other research, the present study had limitations. The use of non-random sampling was the most significant limitation. Using a questionnaire, which is a self-report tool, may introduce bias in respondents' answers. The research population was limited to all patients with irritable bowel syndrome in Babol in 2023, and caution should be taken in generalizing the results to patients with irritable bowel syndrome in other regions and cities and even other diseases. It is suggested that future research use random sampling methods to better generalize the results. Researchers should conduct this study on other women and men with different diseases in other treatment centers and cities and compare their results with those of the present study to discuss the generalizability and effectiveness of the results more accurately and confidently.

Authors' Contributions

M.A.E. conceptualized the study, designed the research methodology, and supervised the implementation of the therapy sessions. S.O.E., the corresponding author, conducted the data analysis using a mixed design with repeated measures, interpreted the results, and led the drafting and revising of the manuscript. B.M. assisted with the recruitment of participants, facilitated the therapy sessions, and contributed to the literature review and data collection. All authors participated in discussing the findings, critically reviewed the manuscript for important intellectual content, and approved the final version for publication.

Declaration

In order to correct and improve the academic writing of our paper, we have used the language model ChatGPT.

Transparency Statement

Data are available for research purposes upon reasonable request to the corresponding author.

Acknowledgments

We would like to express our gratitude to all individuals helped us to do the project.

Declaration of Interest

The authors report no conflict of interest.

Funding

According to the authors, this article has no financial support.

Ethics Considerations

The study placed a high emphasis on ethical considerations. Informed consent obtained from all participants, ensuring they are fully aware of the nature of the study and their role in it. Confidentiality strictly maintained, with data anonymized to protect individual privacy. The study adhered to the ethical guidelines for research with human subjects as outlined in the Declaration of Helsinki.

References

1. Ringel Y, Maharshak N. Intestinal microbiota and immune function in the pathogenesis of irritable bowel syndrome. American Journal of Physiology-Gastrointestinal and Liver

Physiology. 2013;305(8):G529-G41. [PMID: 23886861] [PMCID: PMC3798736] [DOI]
2. Fukudo S, Kaneko H, Akiho H, Inamori M, Endo Y, Okumura T, et al. Evidence-based clinical practice guidelines for irritable bowel syndrome. Journal of Gastroenterology. 2015;50(1):11-30. [PMID: 25500976] [DOI]
3. Vahedi H, Ansari R, Mir-Nasseri M, Jafari E. Irritable bowel syndrome: a review article. Middle East J Dig Dis. 2010;2(2):66-77. [PMCID: PMC4154827]
4. Waldhausen JHT. American Pediatric Surgical Association Presidential Address 2021 A Surgeon's Purpose. Journal of Pediatric Surgery. 2022;57(1):2-8. [PMID: 34366131] [DOI]
5. Dharsana IK, Suarni NK, Sudarsana GN, Paramartha WE, Ahmad M. Cognitive-Behavioral Therapy counseling in developing Cross-Gender Friendship in adolescents. Enfermería Clínica. 2020;30:206-8. [DOI]
6. Ashrafi M, Jomehri F, Niknam M, Rafieipour A. Effects of Cognitive Restructuring on Health Control and Self-Care in Women With Hypertension. MEJDS. 2020;10(0):191-.
7. Erhardt D, Bunyi J, Dodge-Rice Z, Neary M, Schueller SM. Digitized thought records: a practitioner-focused review of cognitive restructuring apps. The Cognitive Behaviour Therapist. 2022;15:e39. [DOI]
8. Azcue N, Gómez-Esteban JC, Acera M, Tijero B, Fernandez T, Ayo-Mentxakatorre N, et al. Brain fog of post-COVID-19 condition and Chronic Fatigue Syndrome, same medical disorder? Journal of Translational Medicine. 2022;20(1):569. [PMID: 36474290] [PMCID: PMC9724286] [DOI]
9. 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. Health Psychology. 2022;11(42):85-100. [DOI]
10. Soleimani S, Tajoddini E. Effectiveness of Cognitive Behavioral Therapy Based on Fatigue on Dimensions of Mental Fatigue in Patients with Multiple Sclerosis: a case study. Journal of Clinical Psychology. 2016;8(2):13-21. [DOI]
11. Pakandish S, Kraskian A, Jamhari F. Determining the Effectiveness of Cognitive-Behavioral Therapy in Regulating Emotion and Mental Health of Obese Women. IJNR. 2021;16(2):59-68.
12. Dowsett E, Delfabbro P, Chur-Hansen A. Adult separation anxiety disorder: The human-animal bond. Journal of Affective Disorders. 2020;270:90-6. [PMID: 32339110] [DOI]
13. Pan Y, Liu H-y, 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. [PMID: 36639702] [PMCID: PMC9840313] [DOI]
14. Hooshmandi R, Aljaberi MA, Hammadi F, Ma J. The Impact of Interoceptive Awareness on Pain Catastrophizing and Illness Perception. Journal of Personality and Psychosomatic Research (JPPR). 2024;2(2):4-10. [DOI]
15. Barlow DH, Rapee RM, Reisner LG. Mastering stress 2001 : a lifestyle approach. Dallas, Tex.: American Health Pub; 2001.
16. 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. frooyesh. 2021;10(9):193-204.
17. Clark KB. Smart Device-Driven Corticolimbic Plasticity in Cognitive-Emotional Restructuring of Space-Related Neuropsychiatric Disease and Injury. Life [Internet]. 2022 PMC8875345]; 12(2).
18. Larsson A, Hooper N, Osborne LA, Bennett P, McHugh L. Using Brief Cognitive Restructuring and Cognitive Defusion Techniques to Cope With Negative Thoughts. Behavior Modification. 2015;40(3):452-82. [PMID: 26685210] [DOI]
19. Fiqri AM, Sjattar EL, Irwan AM. Cognitive Behavioral Therapy for self-care behaviors with type 2 diabetes mellitus patients: A systematic review. Diabetes & Metabolic Syndrome: Clinical Research & Reviews. 2022;16(7):102538. [PMID: https://doi.org/10.1016/j.dsx.2022.102538] [DOI]
20. Bobomuratov TA, Imamova AOK. Forms and methods for forming a healthy lifestyle in children. Academic research in educational sciences. 2023(1):19-23.
21. Blattman C, Chaskel S, Jamison JC, Sheridan M. Cognitive Behavioral Therapy Reduces Crime and Violence over Ten Years: Experimental Evidence. American Economic Review: Insights. 2023;5(4):527-45. [DOI]
22. Soleymani Eslami A, Dastgiri S, Yaghoubi A, Golestan B, Imani S, Hemmati N, et al. Comparison of coronary artery disease risk factors between patients below and above 45 years old. sjsph. 2012;9(3):13-22.
23. Gerrits MMJG, van Marwijk HWJ, van Oppen P, van der Horst H, Penninx BWJH. Longitudinal association between pain, and depression and anxiety over four years. Journal of Psychosomatic Research. 2015;78(1):64-70. [PMID: 25466385] [DOI]

Health Nexus
E-ISSN: 2981-2569