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Original Article

The Effect of Integrating Cognitive-Behavioral Therapy and Mindfulness Therapy on Lifestyle of Women with Irritable Bowel Syndrome

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Abstract

Background: Psychological distresses and stresses are believed to significantly increase the symptoms of irritable bowel syndrome (IBS). In contrast, healthy lifestyle plays an effective role in the prevention and treatment of IBS. The present article investigated the effect of integrating cognitive-behavioral therapy and mindfulness therapy on the lifestyle of patients with IBS in Tehran.
Methods: This study was quasi-experimental (pre-test, post-test, and a one-month follow-up design, and a control group). The statistical population herein included all the women with IBS referred to the Gastroenterology Research Center of Shariati Hospital in Tehran in 2020. We selected 30 patients who were willing to participate in the study using convenience sampling and randomly divided them into the control and experimental groups (n=15 per group). The experimental group underwent 12 sessions (90-minute sessions, two days a week) of integrating cognitive-behavioral therapy and mindfulness therapy, yet the control group received no intervention. The research instrument included the Lifestyle Questionnaire (LSQ). Data analysis was carried out using repeated measures ANOVA.
Results: The results indicated that integrating cognitive-behavioral therapy and mindfulness therapy effectively improved lifestyles in women with IBS (P<0.001). The mean post-test and follow-up scores of the experimental group were 162.58±30.83 and 166.00±26.61, respectively, which increased compared to the pre-test (110.58±10.02), post-test (107.17±9.52), and follow-up (103.33±7.24) of the control group.
Conclusion: Integrating cognitive-behavioral therapy and mindfulness therapy could be recommended as an effective training to improve the lifestyle of women with IBS.

Keywords: Cognitive-behavioral therapy, Mindfulness, Irritable bowel syndrome, Lifestyle, Women

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1. Introduction

Irritable bowel syndrome (IBS) is a prevalent gastrointestinal disorder. IBS has been classified as a functional disorder in the International Classification of Diseases 10th revision (ICD-10) and as a psychosomatic disorder in the International Classification of Diseases 11th revision (ICD-11). Patients suffering from IBS complain about various symptoms, such as changes in bowel habits, abdominal pain, constipation or diarrhea, and meteorism, all of which impair the quality of life. The average prevalence of IBS has been reported 11.2% across the world (1). Patients often complain about a significant reduction in their quality of life. In these patients, the quality of life depends on certain parameters, including fear of gastrointestinal symptoms, clinical variables, or demographic factors (2). IBS may also lead to some psychiatric disorders; therefore, a comprehensive treatment package must be offered for the treatment of IBS patients (3). The gut-brain axis (GBA) consists of bidirectional communication between the central and the enteric nervous system in the brain. This bilateral communication occurs from the gut microbiota to the brain and vice versa. Gut microbiota can improve neurological disorders, such as autism, Parkinson's, and Alzheimer's, through GBA. It can affect emotional behaviors by stimulating endocrine and paracrine signals (4). Dysregulated GBA and microbiome are the main medical causes of IBS, which may play a crucial role in the pathophysiology of the disease (5). A dysregulated GBA can lead to altered bowel movements, intestinal immune response, or intestinal permeability that may trigger inflammatory responses contributing to visceral hypersensitivity (6). The microbiome of IBS patients seems to be less diverse and may be observed in other parts of the intestine as seen in small intestinal bacterial overgrowth (7).

The direct interaction between the gut and the brain and high overlap between psychiatric diseases and IBS help researchers select effective therapeutic components. The most common psychiatric comorbidities in IBS patients include anxiety disorders (30-50%), depression (70%), eating disorders (2), high and often unrealistic

personal expectations (high levels of perfectionism) (8), high levels of stress, sleeping disorders (9), early maladaptive schemas, impaired body awareness, failure intolerance (10), and low quality of life (11, 12). People with highly healthy lifestyles are less likely to develop IBS than those with less healthy lifestyles. IBS is significantly less prevalent in individuals with healthy eating habits (including regular meal plans, slow/moderate eating speed, proper fluid intake during eating, moderate/long meal-to-sleep intervals, and low/moderate consumption of fatty foods) compared to in those with unhealthy eating habits. In addition, people with lower levels of psychological distress are significantly less likely to develop IBS compared with those with higher levels of distress (13).

The unhealthy lifestyle and poor well-being of IBS patients have been confirmed in several studies; this highlights the importance of prevention and treatment measures (11, 14). Numerous psychological interventions have been used to reduce the psychiatric or psychological problems of IBS patients since, as mentioned earlier, the pathophysiology of this disease is brutally complex. The pathophysiology of IBS could be explained through a biopsychosocial model consisting of biological, psychological, and social factors. Psychotherapy is still an important option for the treatment of IBS patients (15, 16). Due to many underlying causes, the treatment of IBS consists of several components. In addition to medical interventions, most patients seek treatment through changing lifestyle and diet. Nevertheless, psychotherapy is still an important option for patients with IBS and should not be limited to those with concomitant psychiatric disorders (16). Psychosocial therapies, which include body-mind interactions, can effectively reduce the symptoms of functional disorders of the lower gastrointestinal (GI) in adults with IBS. In our study, the psychological interventions were significantly effective on the treatment of gastrointestinal disorders in the first post-treatment assessment and short-term and long-term follow-ups (17). Common evidence-based psychotherapeutic options utilized for the treatment of IBS patients include psychoeducation, cognitive-behavioral therapy, mindfulness-based cognitive therapy, self-help, psychotherapy, psychodynamic hypnotherapy, and relaxation therapy (18). Norouzi and colleagues (19) showed that mindfulness therapy can be effective on reducing and controlling psychological symptoms and enhancing well-being in patients with IBS.

No specific IBS intervention plans have been to date developed focusing on the constructs of a healthy lifestyle. To this end, this study used the integration of mindfulness and cognitive-behavioral approaches, as two proven treatments for IBS and similar diseases. According to this background, the present work aimed to investigate the effectiveness of integrating cognitive-behavioral therapy and mindfulness therapy on lifestyle of patients with IBS in Tehran, Iran.

2. Methods

This study was quasi-experimental (pre-test, post-test, and a one-month follow-up design, and a control group). The statistical population included all the women with IBS referred to the Gastroenterology Research Center of Shariati Hospital in Tehran, in 2020, and were diagnosed with IBS by a gastroenterologist based on Rome III: diagnosis criteria for IBS. The inclusion criteria were getting a score lower than the mean in the lifestyle questionnaire, having high school education at the minimum, being aged between 20 to 50 years, signing the written consent to participate in the study, and not participating in psychological sessions over the last six months. The exclusion criteria included blood in the stool, gastrointestinal bleeding, pregnancy or pregnancy decision during the study, history of abdominal surgery, a history of diagnosis of mental illness in the past two years, and more than two sessions of absence in the treatment sessions. We selected 30 patients willing to participate in the study using convenience sampling and randomly divided them into the experimental and control groups (n=15 per group). The size of the sample group was selected to be 30 people based on G*Power with effect size (1.60) and alpha (0.05) and power of a test (0.90) (20). The participants were then randomly allocated into the experimental and control groups applying a random number table. In this way, even numbers were considered for the experimental group and odd numbers for the control group. The experimental group underwent 12 sessions (90-minute sessions, twice a week) of integrating cognitive-behavioral therapy and mindfulness therapy whereas the control group received no intervention. The follow-up was done in the experimental and control groups after 30 days. To take ethical considerations into account, written consent was obtained from the patients.

2.1. Instrument

Lifestyle Questionnaire (LSQ): This 70-item questionnaire was developed by Lali and colleagues (21) for assessment of an individual's lifestyle. The items are scored on a four-point Likert scale, including

Table 1: A summary of integrating cognitive-behavioral therapy and mindfulness therapy sessions

Session	Content	Goals
1	Introducing and inviting the participants to introduce themselves; describing the reasons behind the gathering and benefits of the sessions and explaining the need for confidentiality; describing how the sessions are organized; describing mindfulness process and the raisin meditation; practicing body scan meditation; practicing 10 minutes of mindful breathing	Conducting the pre-test; encouraging the participants to attend the sessions by providing them with a brief introduction on the training package and its effect on psychological well-being; describing the expectations and goals of the sessions and determining the principles and rules and boundaries of the group; practicing thoughts and feelings
2	Reviewing the previous session's exercises; performing the movement exercise in a mindful state; meditating in a sitting position while focusing on breathing and body; three minutes of breathing space; identifying and recording the calendar of pleasant and unpleasant experiences (to be explored in the upcoming sessions); performing five minutes of visual or auditory mindfulness; walking mindfully	Identifying unpleasant experiences; defining psychological problems of the group members (for example, stress and depression)
3	Reviewing the previous session's exercises; meditating in a sitting position while focusing on breathing and body; emphasizing the need to understand how to react to thoughts, feelings, and body sensations; three minutes of breathing space; practicing alternative moods, thoughts, and perspectives	Identifying unpleasant experiences; exploring habitual response patterns and the potential use of mindfulness skills to facilitate responsiveness to the present moment; developing a broader view of thoughts
4	Reviewing the previous session's exercises; meditating in a sitting position while focusing on breathing, body, sounds, thoughts, and emotions; reviewing the previous sessions and discussing the most valuable things in our lives and the way we can use these exercises to achieve these values	Understanding the relationship between daily activities and mood; reviewing early warning systems and action plans
5	Reviewing the previous session's exercises; describing the cognitive model; reviewing the participants' disorders and current problems; explaining how thoughts lead to feelings; recognizing the difference between thoughts and realities; rating the level of belief in emotion and a thought; using the upward arrow technique	Identifying thoughts and assumptions; classifying different types of distorted thoughts
6	Reviewing the previous session's assignments; assessing the validity of negative thoughts and explaining that negative thoughts are to some extent real; defining specialized terms; using cost-benefit analysis technique, evidence review technique, and advocate technique	Assessing and challenging spontaneous negative thoughts
7	Reviewing the previous session's assignments; explaining why spontaneous thoughts may cause problems in some situations; identifying rules or assumptions; challenging "shoulds"; using the value system evaluation technique; distinguishing between progress and perfectionism; setting adaptive standards and assumptions	Assessing and challenging assumptions or rules
8	Reviewing the previous session's assignments; explaining that persistent concern is disabling and that most people complain about their concerns; using the concern recognition technique; using a technique to convert concerns into predictions; using the cost-benefit analysis technique; distinguishing between useful and useless concerns	Assessing concerns
9	Reviewing the previous session's assignments; reviewing the concern assessment techniques; using the concern scheduling technique; using the self-fulfilling prophecy technique; drowning in uncertainty; using the acceptance technique	Assessing concerns
10	Reviewing the previous session's assignments; explaining about emotions and identifying emotions and thoughts associated with emotional schemas; using the emotion regulation reappraisal technique; using the emotional discharge techniques (writing); identifying emotional schemas; improving emotional processing skills	Using emotion regulation strategies
11	Reviewing the previous session's assignments; explaining about the concept of stress, physical symptoms of stress, and stressors; teaching the relaxation technique; describing effective coping strategies; discussing physical coping methods	Using stress management strategies
12	Reviewing the previous session's assignments; discussing the concepts of social skill, interpersonal relationships, social support, and communication skills; teaching expressive behavior techniques; discussing the concepts of self-confidence and self-esteem and introducing some techniques to improve these features; conducting the post-test stage	Increasing social skills and expanding social supports

always (score 3), often (score 2), sometimes (score 1), and never (score 0). The questionnaire consists of 10 main dimensions of physical activity, physical health, exercise, balanced consumption of food, weight control and nutrition, mental health, reproductive health, drug and alcohol avoidance, environmental pollutants, and harmful substances. Based on the factor analysis results, 10 dimensions with eigenvalues >1 were extracted, which explained 46.22% of the total variance of lifestyle. The overall score of the questionnaire ranged from 0 to 210. In the present study, the total score of this questionnaire was used. High and low scores indicate appropriate and inappropriate lifestyle, respectively. Lali and colleagues (21) reported an alpha Cronbach coefficient of 0.89 for the questionnaire. In this study, Cronbach's alpha was 0.72.

2.2. Intervention Program

The protocol of the cognitive-behavioral sessions was set based on a book by Motabi and Fati, entitled "On Becoming a Cognitive Behavioral Therapist," (22) and another book by Hawton and colleagues (23), entitled "Cognitive Behaviour Therapy for Psychiatric Problems: A Practical Guide (Oxford Medical Publications) 1st." The mindfulness sessions were set based on a package developed by Bowen and colleagues (24). Cognitive-behavioral therapy signifies the cognitive and behavioral processes of what is under personal control and mindfulness-based education improves the perception of thoughts, feelings, and autonomous bodily emotions and feelings by combining meditation and body-inspection techniques. Accordingly, we conducted this work to integrate and use these two treatments at the same time; each session was divided into the mindfulness and cognitive-behavioral therapies. Table 1 presents a summary of the intervention program.

2.3. Statistical Analyses

Data analysis was done through descriptive and inferential statistics includes mean, standard deviation, and repeated-measures analysis. The Shapiro-Wilk test was employed to examine the normality of distribution of pre-test, post-test, and follow-up. The repeated-measures ANOVA was used to investigate the research hypothesis. SPSS version 23.0 was further utilized to analyze the data.

3. Results

The participants included 30 women with IBS, aged 39.68±9.38 years old. The subjects in the experimental group were 66.67% married and 33.33% single. In the control group, 60.00% were married and 40.00% were single. In terms of education, 26.42% and 73.33% of the patients in the experimental group had a high school degree and college education, respectively; meanwhile, 33.33% and 66.67% of those in the control group had high school degree and college education, respectively. Table 2 depicts the demographic characteristics of the participants.

Table 3 represents the mean, standard deviation, and the results from the Shapiro-Wilk test for investigating the normality of the data. According to this table, the distribution normality of all the variables was acceptable because the significance level of the Shapiro-Wilk test was higher than 0.05 for all the states.

The repeated measures ANOVA was used to

Table 2: Demographic characteristics of the participants

Groups	Mean±SD age (years)	Education		Marital status	
		High school education (number (%))	College education (number (%))	Married (number (%))	Single (number (%))
Experimental	40.20±8.72	4 (26.67)	11 (73.33)	10 (66.67)	5 (33.33)
Control	39.04±9.12	5 (33.33)	10 (66.67)	9 (60.00)	6 (40.00)
P	0.172	0.460		0.389	

Table 3: Mean and standard deviation of the lifestyles in the experimental and control groups in the pre-test, post-test, and follow-up

Variable	Phases	Experimental group			Control group		
		Mean±SD	Shapiro-Wilk	P	Mean±SD	Shapiro-Wilk	P
Lifestyles	Pre-test	108.92±11.58	0.16	0.200	110.58±10.02	0.13	0.20
	Post-test	162.58±30.83	0.92	0.272	107.17±9.52	0.90	0.19
	Follow-up	166.00±26.61	0.99	0.284	103.33±7.24	0.94	0.39

Table 4: Results of repeated measurement concerning the effects of time and interaction time and group

Source	Variable	SS	df	MS	F	P	η2
Time	Lifestyles	10017.19	1.32	7589.43	32.083	<0.001	0.593
Group		27105.68	1	27105.68	38.36	<0.001	0.636
Time × group		14899.69	1.32	11288.60	47.720	<0.001	0.684

examine the research hypothesis. Mauchly's sphericity test showed that the spherical hypothesis could not be applied to lifestyle. As a result, the degree of freedom of this variable was modified via the Greenhouse-Geisser correction method.

Based on Table 4, time had a positively significant relationship with lifestyle (P<0.001). The value of Eta squared for the lifestyle indicated that 59.3% of the variance of this variable was explained by growth-oriented psychotherapy. Moreover, the interactive effect of the time*group on lifestyle was positive and significant (P<0.001). Eta squared value for the lifestyle indicated that 68.4% of the variance of this variable was explained by the interaction of the independent variables and time.

The pairwise comparisons of means in the experimental group showed a significant difference between the pre-test and post-test results in the lifestyle (P<0.001). In other words, the integration of cognitive-behavioral therapy could significantly improve the lifestyle. There was a significant difference between the pre-test and follow-up results (P<0.001). In other words, the integration of cognitive-behavioral therapy could significantly improve the quality of lifestyle. As a result, the integration of cognitive-behavioral therapy had a stable effect on the improvement of the quality of lifestyle. There were no significant differences between the post-test and follow-up results.

4. Discussion

This study aimed to investigate the effect of integrating cognitive behavioral therapy and mindfulness therapy on the lifestyle of patients with IBS in Tehran, Iran. The results revealed that the life scores in the pre-test, post-test, and follow-up stages were significantly different. According to these findings, integrating cognitive-behavioral treatment positively affected the lifestyle in these patients. This result is consistent with those of Zhao and colleagues (25) and Alipour and colleagues (26).

Various studies have reported that the level of stress is higher and the quality of life is lower in patients with IBS compared to those in normal people (11, 27, 28). de MendonÇa and colleagues (29) showed that patients with IBS had an unhealthier diet, more body fat, occupational issues, mental tiredness, anxiety, depression, and lower quality of life. In addition, patients' fear of digestive symptoms with undesired consequences is a predictor of the reduced quality of life and increased distress (3).

Our training method seemed to have reduced the relevant symptoms in IBS patients by modifying their lifestyle, improving their behaviors, and using relaxation techniques. Since IBS is a psychosomatic disease, several biological and psychological factors affect its emergence and development (25). Immune system disorders, bacterial or infectious agents, brain and central nervous system (CNS) conditions, and psychosocial stresses may trigger this syndrome (30). Therapeutic techniques, such as cognitive-behavioral therapy, mindfulness, mental imagery techniques, emotion regulation strategies, and meditation, increase parasympathetic nervous system activity and evoke relaxation responses. These responses, in turn, reduce stress levels, the severity of IBS symptoms, and respiration and oxygen consumption rates. That said, this treatment method reduces IBS symptoms by removing potential barriers, teaching problem-solving skills, and controlling life stressors (25). Educating patients with problem-solving skills and how to cope with stressors has contributed to reduction in IBS symptoms (31). Cline and co-workers (32) believes that one can cope with situations, which are dominantly controlled by the environment, through improving his/her coping skills. The integration of cognitive-behavioral therapy and mindfulness therapy contributed to the improvement of physical health outcomes (IBS symptoms) through using cognitive reconstruction strategies and conducting behavioral experiments to select the conscious path of behavior and the subconscious path of emotion control and physiological clues. Ahmadipour and Kiarash (33) showed that the improvement of lifestyle could help people maintain their health and adapt themselves to everyday stresses since a proper lifestyle can play an effective role in creating happiness and preventing stress and depression.

A person's lifestyle describes the way he/she lives

and includes nutrition, physical activity, smoking, and drug use. Non-smokers who have a healthy diet, high physical-psychological activities, and social strength, and high economic productivity rarely suffer from lung diseases, cancers, and chronic diseases and enjoy great physical and mental health (34). Cognitive-behavioral therapy and mindfulness therapy deals with wrong schemas and wrong attitudes; therefore, in this study, this therapeutic approach improved the participants' lifestyles and promoted their general health through cognitive restructuring. In addition, the use of integrating cognitive-behavioral therapy and mindfulness therapy in the training sessions and group discussions motivated the participants to follow the treatment plan and change their lifestyles.

There were certain limitations in this research, among which we could point out the lack of ordinary counseling sessions, as a placebo, for the control group. The present study was conducted on women with IBS in Tehran. As a result, the generalization of the results to communities with different sociocultural properties should be done cautiously and it is recommended to apply the integrative cognitive-behavioral and mindfulness treatment to male subjects too. The researchers could suggest utilization of other therapeutic approaches and their comparison to the those in this work concerning the reduction in multifaceted symptoms of gastrointestinal diseases in IBS patients.

5. Conclusion

According to the results of the present study, integrating cognitive-behavioral therapy had a positive effect on improving the lifestyle of patients with IBS. Thus, integrating cognitive-behavioral therapy and mindfulness therapy could be a promising approach to improving the lifestyles of women with IBS. It could be recommended that relevant authorities organize psychological workshops to improve the knowledge and experience of counselors and psychologists about integrating cognitive-behavioral therapy and mindfulness therapy, which is believed to be conducive to the quality of life of IBS patients.

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Ethical Approval

The study was approved by the Ethics Committee of Islamic Azad University, Tonekabon branch (code: IR.IAU.TON.REC.1399.011).

Conflict of interest: None declared.

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