

## Comparison of long-term effects of cognitive-behavioral therapy versus mindfulness-based therapy on reduction of symptoms among patients suffering from irritable bowel syndrome

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### ABSTRACT

**Aim:** The aim of this study was to compare the long-term effects of cognitive-behavioral treatment and mindfulness-based treatment on decreasing symptoms of patients suffering from irritable bowel syndrome (IBS).

**Background:** One of the most modern therapies put forward in therapy of IBS is mindfulness-based metacognitive therapy.

**Patients and methods:** In this quasi-experimental study, 36 people with mean age of 32 years old, including 24 patients with IBS and 12 healthy normal subjects as control group, were studied. Patients with IBS were randomly divided into two experimental groups of cognitive-behavioral treatment (n=12) and mindfulness-based treatment (n=12). Data were analysed by one-way covariance analysis.

**Results:** There was significant decrease of the symptoms of IBS among two treatment groups versus control group in long-term (p<0.05). Mindfulness-based therapy was the most effective technique in decreasing symptoms.

**Conclusion:** This study showed mindfulness-based therapy, as a modern psychotherapy technique, is an effective method to decrease symptoms of patients with irritable bowel syndrome, compared with old methods. Therefore, this technique is advised among these patients, especially those who have refractory symptoms.

**Keywords:** Cognitive-behavior therapy, Mindfulness-based therapy, Irritable bowel syndrome, Decrease in the symptoms, Long-term effects, Iran.

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### Introduction

Irritable bowel syndrome (IBS) is the most prevalent functional gastrointestinal disorder affecting quality of life (1). Irritable bowel syndrome, as a functional disorder, is characterized by changes in bowel movement and abdominal pain, without any detectable structural disorder. There are no clear diagnostic symptoms for diagnosis of IBS; therefore, diagnosis of the

diseases would be on the strength of the clinical manifestations (2). Abnormal psychological symptoms are reported in 80% of IBS patients, but no definite psychiatric diagnosis predominates (2). Relationship between the digestive diseases and psychological diseases indicates the particular relationship between the brain and intestine, which is idiomatically called brain-gut axis. Amygdala, hippocampus and prefrontal cortex parts may regulate the function of intestine, and on the other hand, may include regulation of the emotion such as disposition/temper, trepidation, negative

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affections, pain and also cognitive behaviors, such as problem solving, designing, searching information, and finally training the social behavior, contrastive and psychological rehabilitation skills (3). At least, half of the patients are reported to suffer from psychological disorders, such as depression, panic, agoraphobia and simple phobias (4). Association of psychological disorders with IBS may cause us to draw this conclusion that the psychotherapies are effective in decreasing the symptoms and increasing quality of life. Among techniques of psychotherapy in IBS patients, CBT (cognitive behavior therapy) is of high level of importance and is very effective in decreasing anxiety, agitation, and depression and using the coping skills, and also relieving pain and other symptoms and signs (5,6). In the cognitive theories, it is assumed that there is a disorder/disorganization and imbalance between the cognitive and emotional centers of the central nervous system (CNS), neural-endocrine system and neural-intestinal systems. In the patients suffering from cognitive disorder and unhealthy patterns of thinking about their environment and disease; extravagant emotional reactions and digestive symptoms may appear (7). Similar to Beck's cognitive pattern in cognitive therapy of the IBS patients, efforts have been made to identify and improve the nuclear useless thoughts and beliefs, which may have extravagant emotional and psychological reactions and the intestinal symptoms (6). Despite the effectiveness of the cognitive behavior therapy in decreasing the symptoms (5, 8, 9), some recent studies have indicated the cognitive behavioral therapy, is not always effective and useful in the patients suffering from such a disease, especially in long-term (4). On the other hand, CBT as a known technique in IBS therapy is more effective in a short-term period (10). Moreover, two recent large studies were not able to show the positive results of CBT therapy for IBS (4, 11). Considering the recent adverse results in cognitive-behavior therapy of IBS, and also nonbeing of long-term positive

effect in follow-up studies, attention to other psychological interventions in IBS therapy and its comparison with cognitive-behavior therapy, which has already been the mostly-applied psychotherapy in treatment of IBS, might be lucrative and profitable. Another alive and relevant therapy of IBS, which claims the long-term and more permanent effects in IBS therapy, is mindfulness-based therapy (MFT) (10-14). Certainly, one of the most modern therapies put forward in therapy of IBS is mindfulness-based metacognitive therapy. MFT may consciously and intentionally increase the level of capacity and capability of data processing system (13). In patients suffering from IBS, the middle cingulate cortex of the brain, which is related to the process of attention and answer choosing, shows more activity, and the changes in this part of the brain is associated with the mental sense of unpleasantness of pain (2). Whereas, MFT therapy decreases the activity of the regions related to effective function, decreases the evaluation related to emotional regulation, and increases the activity of the anterior cingulate, thalamus and insula, which may cause the lower level of pain (14-16). Therefore, MFT may affect the cerebral pathways involved in IBS, and cause cognition of visceral-gut pain, and as a result, MFT may decrease the severity of signs and symptoms of IBS.

The present study was conducted to pay attention to the long-term and effective modern psychological therapies in IBS, and also compare efficacy of most applicable psychological therapies in IBS, including cognitive-behavioral therapy and MFT in decreasing symptoms of the IBS patients.

## Patients and Methods

### Population

Patients suffering from IBS, who approached Imam Khomeini hospital and one gastroenterology clinic in Tehran, between February 2012 and October 2012, were studied.

A gastroenterologist according to ROME III criteria approved diagnosis of IBS.

### **Sampling Method**

In this quasi-experimental study, 36 people with the mean age of 32 years old, including 24 patients with IBS and 12 healthy normal subjects as control group, were studied. Patients with IBS were randomly divided into two experimental groups of cognitive-behavioral treatment (n=12) and mindfulness-based treatment (n=12). Control group didn't receive any psychological intervention.

### **Cognitive-Behavior Therapy**

Cognitive pattern applied in the present therapy was on the basis of a general modeling of Judith Beck's model. In consideration of the nature of irritable bowel syndrome, changes were made, and the behavioral methods and approaches, and also the activities planning merged in the same pattern. As a psychosomatic disease, CBT was done in 8 therapy sessions, once a week, each for 2:30 hours (17).

### **Mindfulness-based Therapy**

Such a therapy program is planned on the severity of the pain and stress management-based mindfulness therapy in the IBS patients on the basis of the mindfulness-based stress reduction (MBSR) (14, 18). Therapy plan was 8 sessions of group therapy, 2 hours once a week (14, 18).

### **Research Devices**

- Questionnaire of the personal identifications prepared by the researcher, including the demographics information, age, sex, profession and level of education
- IBS objective questionnaire based on the ROME III criteria (13).

Such a questionnaire includes the questions, which could rate the existence or nonexistence of the symptoms of IBS disease. Furthermore, the high grade indicates scores characterize the

disease intensity. This questionnaire includes 10 multi-choice questions in Liker's scale. Patient will achieve one score instead of each special choice, which confirms IBS. At the end, the positive scores will be gathered together in a question complex, and the rate of the intensity of the patience will be determined. The higher the level of scores of the patient, the more benefits for the illness (high intensity of the disease). It is to be noted that the kind of IBS disease will be determined through this questionnaire. Gastroenterologist in the process of examination completed questionnaire. Persian edition of the questionnaire has been standardized in Iran, and has a validity with Cronbach's  $\alpha > 0.7$  (15,16,19).

### **Data Analysis Methods**

Subjects were evaluated before beginning the study (pretest), at the end of study (post test), and two months later (follow up). Data were shown by mean  $\pm$  standard deviation for numerical and frequency (percent) for categorical variables. Data were analysed by one-way covariance analysis.

### **Results**

Thirty- six subjects with mean age of 32 years, including 20 male and 16 female, were studied. 21 persons were married and 15 persons were single. Most patients held associate's degree certificate of Bachelor's degree certificate. Demographic characteristics and disease intensity of subjects' are presents in table 1. In consideration of application of the pretest method, the one-way covariance analysis method was applied. Therefore, before execution of the one-way covariance analysis method, the presumption of assimilation of beta coefficients was examined and confirmed. Then, one-way covariance analysis method was applied (table 2).

There were significant differences between the three groups in decreasing the clinical symptoms

**Table 1.** Demographic characteristics disease intensity of the study groups

Variable\Groups		Mindfulness	Cognitive-Behavior	Control
		N=12	N= 12	N= 12
Age		34.25±4.16*	29.42±5.82	33.42±5.3
Sex	Female	6 (50) <sup>†</sup>	5 (48)	5 (48)
	Male	6 (50)	7 (59)	7 (59)
Marital Status	Married	5 (41)	6 (50)	10 (83)
	Single	7 (59)	6 (50)	2 (17)
Education	Associate's Degree	6 (50)	4 (33)	4 (33)
	Bachelor's Degree	4 (33)	7 (59)	5 (42)
	Master's Degree	2 (17)	1 (8)	2 (17)
	PhD	0 (0)	0 (0)	1 (8)
Disease Intensity	Pretest	17.7±3.7	17.83±3.01	22.41±5.42
	Follow-up/ Tracing	11.5±4.1	16.8±4.7	23.1±6.1

**Table 2.** Results of one-way covariance analysis for effectiveness of two methods of therapy in follow-up dependent variable total IBS follow-up

Source	Type III Sum of Squares	Df	Mean Square	F	Sig	Partial Eta Squared	Noncent Parameter	Observed Power
Total IBS Pretest	Hypothesis 371.447	1	371.447	25.176	-	0.44	25.176	0.998
	Error 472.136	32	14.754					
Group	Hypothesis 323.417	2	161.708	10.96	-	0407	21.92	0985
	Error 472.136	32	14.754					

a. Computed using alpha = 0.05

b. 0.47 MS (group) + MS (Error)  
MS (Error)**Table 3.** Results of LSD post hoc test for determination of difference among therapy groups in follow-up process dependent variable-total IBS follow-up\*

I Group	J Group	Mean Difference I-J	Std. Error	Sig.	95% Confidence Interval for Difference	
					Lower Bound	Upper Bound
CBT	Mindfulness	5.199	1.568	0.002	2.005	8.394
	Control	-2.567	1.731	0.148	-6.094	0.96
Mindfulness	CBT <sup>†</sup>	-5.199	1.568	0.002	-8.394	-2.005
	Control	-7.766	1.743	0.0	-11.317	-4.216
Control	CBT	2.567	1.731	0.148	-0.960	6.094
	Mindfulness	7.766	1.743	0	4.216	11.317

\* Based on estimated marginal means; The mean difference is significant at the 0.05 level; Adjustment for multiple comparisons: Least significant difference (equivalent to no adjustment);

<sup>†</sup> CBT: cognitive behavior therapy

in the follow-up, in spite of significance of pretest findings. To determine differences between each two groups, the LSD Follow-up test was applied (Table 3).

As seen in table 3, the results of post hoc test indicate that there is a significant difference between the mindfulness-based therapy and cognitive behavior therapy in decreasing the

symptoms of IBS symptoms in follow-up. ( $p < 0.05$ ). Whereas, there was no significant difference between CBT therapy and control group. In other words, mean score of clinical symptoms was lower in those received MFT therapy compared with CBT and control groups after 2-month follow-up.

## Discussion

In consideration of the contribution of psychological factors in developing IBS, the necessity of attention to application of the psychological therapies in decreasing the symptoms is clear for everyone. Therefore, several techniques of psychotherapy, such as hypnotherapy (8, 19), biofeedback (10, 19, 20), cognitive behavior therapy (1, 8, 9), relaxation training (9, 21, 22) and psychodynamic interpersonal therapy (21) are applied in the treatment of IBS patients.

In the meantime, for several years, the cognitive behavior therapy was the most prevalent and effective psychotherapy in irritable bowel syndrome. The present study indicates that mindfulness-based therapy was more effective than cognitive-behavior therapy in decreasing symptoms of IBS after 2-months follows up. Therefore, not only mindfulness-based therapy is more effective at the end of therapy sessions, but also it has long-term effects in comparison with cognitive-behavior therapy. Several studies showed ineffectiveness of CBT on decreasing the symptoms or improving the quality of life of IBS patients in a long-term period (4, 5, 7, 10, 11, 19, 24, 25). In clarification of such a hypothesis, we think the transient effects of the cognitive behavior therapy for the patients suffering from IBS, is failure to pay attention to the following cognitive factors. Lackner reminded this point that in cognitive studies, which have been conducted regarding IBS, the nuclear beliefs and rules have not been taken into consideration (7, 27).

On the other hand, we should point out the part of the homework and its importance in cognitive behavior therapy. In the last session of therapy, the cognitive therapy books and programs were furnished to the patients, and they were requested to study the books, and identify the useless thoughts and displeasing feelings, and register such thoughts and feelings, to be followed up and

pursued in the follow-up session. However,, unfortunately, such a duty was not taken serious by the patients. Therefore, failure in repetition and doing homework (cognitive) by the patients during the follow-up process may increase the probability of recurrence of the disease symptoms.

All studies evaluated long-term effects of mindfulness-based therapy indicate its long-term efficacy (4, 10, 14, 25-28). In explaining such a matter, it seems that in reality, the mindfulness-based therapy is a multi-component approach, which may decrease the symptoms of IBS, through the mental skills of mindfulness, such as awareness of breathing process, conscious eating and other daily attentions (18). In mindfulness-based therapy, the ability to perceive the awareness may be conducted on an independent and neutral basis. Comprehensive mindfulness may be defined as paying attention to the special method in the present time, without judgment (29). Indeed, the nature of the comprehensive mindfulness is replaced by the application of the voluntary control of attention for formation of a kind of cognitive model of information processing, which is entirely against the cognitive model, and may ruin more our life and may not set us free from the insufficient emotional modes (30). On the opinion of Kabat Zinn, training and education of attention control would behave in line with lightness, which may be found on an unusual and rising basis. All-inclusive and comprehensive attention means that we take always in our consideration that who we are, what do we do and why do we do an action (31). Therefore, not only the patient continues performance of the practices, but also during the therapy period, a kind of mindfulness, awareness, attention and multilateral concentration surround the person's life, and such an affect may remain for a long time. It is quite clear that such a trend may continue for several months. Therefore, mindfulness-based therapy may keep and preserve its efficacy in the subsequent follow-ups (31).

In consideration of the foregoing, and taking into consideration the contribution and role of the psychological factors in treatment of irritable bowel syndrome, the necessity of application of the effective and modern therapeutic methods in decreasing symptoms of disease is undeniable, and also, the pharmacotherapy may help the physical and psychological rehabilitation of the patients suffering from such a syndrome, and such a therapy may be possible, exclusively upon cooperation of the gastroenterologists, psychologists and psychiatrists.

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