

Comparative Efficacy of Cognitive-behavioral Therapy and Mindfulness Therapy on Reducing Symptoms and Improving Quality of life in Patients with the Irritable Bowel Syndrome

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ABSTRACT

Irritable bowel syndrome (IBS) is one of the most common gastrointestinal disorders. Approximately 10-20% of adults & adolescents have symptoms consistent with IBS. Half of the patients with IBS have psychiatric disorders, including depression, panic disorder, generalized anxiety disorder. High level of stress, concern and anxiety lead into the low quality life and using inefficient coping skill. The present study aimed at the importance of effectiveness of new psychological therapies in IBS and the comparison of its effectiveness with the most common IBS psychological therapy, cognitive-behavioral therapy and the effectiveness of these two types of therapies in reduction of symptoms and improvement of life quality based on coping skills of the patients with IBS. 36 subjects were selected by convenient sampling and after determining the type of coping skills (problem-focused-emotion –focused) were randomly divided to experiment and control group. Demographic questionnaire and ROMEIII Criteria were used to indicate the characteristics of patients and the severity of IBS. Two Cognitive-behavioral therapy (CBT) for IBS patients and Mindfulness therapy (MFT) were applied for IBS patients. In two treatment groups, the mean general scores of life quality in post-test and follow up had great changes in comparison with pre-test. The number of the subjects in pre-test was similar in terms of the type of coping skills in three groups but the emotion-focused subjects were decreased in post-test in both types of therapy and problem –focused patients were increased. Among two therapy methods, Mindfulness-based method is more effective in increasing the life quality and reduction of clinical symptoms of IBS compared to cognitive-behavioral therapy ($P < 0.05$). The results showed that although there was a significant difference between two therapy methods and two types of coping skills in reduction of clinical symptoms and increasing the life quality of the patients with IBS, there is no interaction between therapy methods and the type of coping skills. The results showed that Mindfulness-based therapy was more effective in reduction of the symptoms and life quality in follow up stage compared to cognitive-behavioral therapy method. Thus, besides the efficacy of mindfulness-based therapy at the end of the therapy, it had long-term effects compared to behavioral-cognitive therapy.

Key words: Cognitive behavioral therapy, Quality of patients life, Irritable bowel syndrome.

INTRODUCTION

Irritable bowel syndrome (IBS) is one of the most common gastrointestinal disorders.

Approximately 10-20% of adults & adolescents have symptoms consistent with IBS (Owyang, 2012). Abnormal mental features are recorded among 80% of the patients with IBS (Owyang, 2012).

Half of the patients with IBS have psychiatric disorders, including depression, panic disorder, generalized anxiety disorder (Spiller *et al.*, 2007; Ljotsson, 2011). High level of stress, concern and anxiety lead into the low quality life and using inefficient coping skill (Meissner *et al.*, 1997; Crane and Martin, 2003). Despite the effectiveness of cognitive-behavioral therapy in reduction of the symptoms and treatment of IBS patients in various studies (Craske, *et al.*, 2001; Reme, *et al.*, 2010; Blanchard, 2007; Lackner, 2006; Bunme, *et al.*, 2004). Some of the studies namely recent researches showed that cognitive-behavioral treatment (CBT) is not useful among IBS patients (Ljotsson *et al.*, 2011). On the other hand, the results of cognitive-behavioral therapy results were less effective in follow up studies (Moss-Morris *et al.*, 2010). Thus, based on the recent contradictory results on application of cognitive-behavioral therapy (CBT) on the patients with IBS and its ineffectiveness in follow up studies, the new approaches of psychological treatments in IBS and its comparison with cognitive-behavioral therapy as the most common type in psychological treatment of IBS are necessary. Among the psychological treatments, mindfulness-based metacognitive therapy (MCT) is the newest cognitive therapy of IBS. The studies have shown that mindfulness-based MCT can lead into the reduction of somatic symptoms, emotions, experiential avoidance, stress and pain (Naliboff *et al.*, 2008). Also it led into the reduction of physical symptoms of IBS, improved life quality and efficient coping skills (Gaylord *et al.*, 2009). As it was said, there is no study regarding the comparison of the effectiveness of the two therapies and there are a few studies regarding the mindfulness-based in treatment of IBS, there is no study regarding the effectiveness of mindfulness-based MCT in Iran, a few studies have been done regarding the role of coping skills as intervention in effectiveness of IBS psychological therapy. The present study aimed to evaluate the effectiveness of MCT in IBS patients and the compare its efficacy with the cognitive-behavioral therapy as the most common psychological therapy for IBS. Furthermore, the effectiveness of these two therapeutic methods based on coping skills to reduce the disease symptoms and improve the quality of life is compared.

METHOD

This was a quasi-experimental design study conducted on three groups one control and two treatment groups (n=36). The pre- and post-scores for each therapy as well as for control group were assessed. The follow-up period was two months.

Study population

The patients with IBS attending the gastroenterology department of Imam Khomeini hospital (Tehran, Iran) and one of the gastroenterology clinics who were verified by the IBS gastroenterologist.

Sample size and sampling method

Based on the experimental design of the study and the high prevalence of IBS in Iran (18%) (Daryani *et al.*, 2006), and by observing the participants exclusion, 36 subjects (12 people in each group) finished the study. The participants were selected by convenient sampling and after determining the type of coping skills (problem-focused-emotion-focused) and they were randomly assigned into the two treatment groups or control group based on the inclusion and exclusion criteria. The inclusion criteria were as following: Aged 20 to 40 years old and having at least Diploma (based on the participative nature in CBT, MFT therapy types and homework, motivation and energy of a person ability to identify the beliefs and emotions and cognitive-behavioral approach are required), the lack of mental disease and physical problems except IBS, the satisfaction to participate in the study.

Exclusion criteria are as following: All who didn't met the above inclusion criteria were excluded from the study

Study Measures

Researcher-built questionnaire (personal characteristics) It is including demographic information including age, gender, job, education and therapy of the participants.

Coping ways questionnaire of Lazarus & Folkman (CWQ)

This questionnaire was provided by (Lazarus and Folkman, 1984) with 66 items. These items measure problem-focused or emotion-focused

coping ways.

Bowel Syndrome Quality of Life Questionnaire (IBS-QOL-34). This questionnaire was provided by (Drossman *et al.*, 2000, Kanazawa *et al.*, 2007). This questionnaire is one of the best measures in this regard with special mental response to different therapies of sensitivity and it is translated and validated into many languages. Its internal consistency is 0.96 ($\alpha=0.96$) and its correlation coefficient is significant with disease symptoms severity. ($r=0.67$, $p<0.01$).

This questionnaire is validated by (Daryani *et al.*, 2006) in Iran. Its internal consistency is ($\alpha=0.88$, $n=41$). Its content validity was verified by some medicine, psychiatric and psychology and epidemiology groups in Iran (Daryani *et al.*, 2010). The validity of the questionnaire was evaluated in the present study and by \pm method, Cronbach's was calculated as ($\pm=0.92$).

ROMEIII Criteria (IBS symptoms index)

This questionnaire was evaluated by a Gastroenterologist based on clinical diagnostic criteria and it was including the questions evaluating the presence or absence of IBS symptoms. The high scores showed the high severity of the disease. This questionnaire was consisting of 10 items (multiple choice) scored on Likert scale and by verification of a special choice of IBS, the patient receives a score. Finally, the positive scores are collected and the severity of the disease was determined. The higher the score, the higher the disease severity and in case of the verification of the Gastroenterologist, the patient receives one score. It can be said that the type of IBS is determined by this questionnaire.

ROMIII questionnaire is completed by Gastroenterologist during the examination. Most of the questions of ROMIII are in line with the revised diagnostic criteria DSM-IV-TR and it can be said that diagnostic criteria of DSM-IV-TR are included for the inclusion of the IBS patients in the present study. The Persian version of the questionnaire is normalized in Iran with the validity of $\pm>0.7$ (Khoshkrood-Mansoori *et al.*, 2009).

Therapy method

1. Cognitive-behavioral therapy (CBT) for IBS

patients

2. Mindfulness therapy (MFT) for IBS patients
* Cognitive-behavioral therapy (CBT) for IBS patients

The cognitive model applied in this therapy was based on Judith beck model and some changes were made based on the conditions of IBS and behavioral methods and planning of the activities are integrated. Based on CBT model in treatment of psychosomatic diseases, the therapy sessions were held once a week (8 sessions) for 2 hours.

The summary of the activities in 8 sessions of CBT:

First session

Introduction, making the members familiar with the nature of their disease and the role of psychological factors in severity of the symptoms- general introduction of cognitive-therapy- determining the aims and expectations of the patient of the treatment process.

Second and third sessions

Teaching cognitive model to the patient, presenting inefficient thought papers, the identification of the thoughts motivating the disease symptoms and bowel discomfort, the problems in recording the thoughts and identification of the emotions and solving them.

Fourth, fifth, sixth and seventh sessions: Training the evaluation of thoughts (verbal challenge and behavioral experiment)- using downward arrow, analysis of the merits and demerits and Socratic questioning of the thoughts creating unpleasant emotion.

Presenting a training tape of progress muscle stress relieving to the members- homework and encouraging the patients to complete them.

Eighth session

The summary of the seven sessions- the introduction of the book to be familiar with cognitive-therapy and making the patients consider intermediate beliefs and core beliefs- feedback of the patients to the therapy sessions.

*MFT therapy for the patients with IBS

As there is no MFT therapy in Iran for IBS treatment and as it is a new approach in IBS, the therapy was based on Gaylord (2009) model. This design was based on MFT to manage stress among the IBS patients in accordance with mindfulness-based stress reduction (MBSR) (Gaylord *et al.*, 2009).

This therapy design is started by training MBSR, then the symptom of IBS is discussed and IBS psychological aspects are discussed. Then, the behaviors and perceptions determining the avoidance of the symptoms with the experiences of the patient of failure in symptom control strategy and the important effects of avoidant behaviors on life quality. The intervention of mindfulness is done by targeting the cognitive coping skills as catastrophization considered based on theoretical background leading into exaggeration of IBS symptoms (Ljotsson *et al.*, 2011 Gaylord, *et al.*, 2009). It seems that therapy plan is based on 8 sessions (2-hour) each week.

The summary of the 8 sessions of MFT are as following:

Session one

Introduction and getting familiarity with MBSR

Being familiar with the type of disease and the role of psychological factors on IBS

Training mindfulness techniques through diaphragmatic breathing, body sensation, and providing non-periodical awareness to the emotions.

Session two

The continuance of body sensations, meditation with awareness of breathe as the primary object of concentration namely to develop concentration, exercise as homework and defining the role of mental interpretation as a way to understand the personal responsibility for thoughts, exercise and homework and awareness of good events in daily activities.

Session three

Training mind yoga to relieve physical symptoms of stress and mindfulness of body

movements and discussing about the physical power in the current time and objective observation of the thoughts, merely thoughts-to the events, homework including the body sensations, soft yoga, and mindfulness mediation of the bad events and awareness of various daily activities.

Session four

Training and mediation practice with emphasis on body sensations perception as simple feelings against the catastrophization. In this session, psych-physiological response of stress is trained. Homework including soft yoga, meditation (for a long time), and awareness of stress reaction.

Session five

Discussing about obligation in homework

Discussing about the role of mindfulness exercises (meditation, Yoga) on the reduction of using catastrophization coping skills about pain feeling of IBS symptoms, expressing the experiences of the patients of failure in symptom control strategies and following mindfulness role in responding to the stress in daily life, discussing about the concept of EQ, homework: Continuing body sensations control, soft yoga, meditation, exercise and awareness of silence of daily reactions to the stress and body sensations.

Session six

Mediation exercise, using metaphors in the quality of mindfulness

The development of internal resources for emotional flexibility based on body mediation, homework (awareness of labels of emotions)

Session seven

Choices less awareness (non-selective) based on mediation (it is including general awareness of the condition and it is non-biased) then mindfulness concentration on the subjective or body issue of the physical and mental symptoms of IBS)

Achieving the required self-confidence in awareness practice, awareness of body feeding and the role of EQ on body nutrition of homework of each of them.

Session eight

The general overview of the sessions, continuing the mediation practice and selecting less awareness with the aim of awareness practice without IBS symptom. The introduction of the book to increase the knowledge of the participants about mindfulness and the exercises, emphasis on continuing the exercises after the end of the sessions, getting the feedback of the participants to the therapy sessions.

METHOD

After the selection of the sample group based on the inclusion criteria, ROMEIII questionnaire was completed by a Gastroenterologist. Then, researcher-built demographic questionnaire, life quality questionnaire of the patients with IBS is completed by the patients. Then, based on the study purpose and by coping skills questionnaire of Folkman & Lazarus (CWQ), the people were identified in terms of the type of coping skills and were considered in problem-focused and emotion focused groups. Finally, CBT and MFT therapy methods were performed in both groups. The

control group underwent medicine therapy and no psychological therapy was done on control group. Finally CBT, MFT methods were compared with each other and with the control group in terms of the reduction of symptoms and improving the life quality. It can be said that to observe the ethical aspects in therapy, one of the therapy models were used by control group after the follow-up.

Data analysis methods

Besides the descriptive methods in study hypotheses test, inference statistics including Two-way ANOVA, ANCOVA, MANOVA and MANCOVA were applied. It can be said that all the data were analyzed by SPSS software, verse 20.

RESULTS

The mean age of the patients was 32.36 ± 5.4 and there was no difference between three groups of cognitive-behavioral, mindfulness and control ($P=0.06$ and X2 test showed that the difference between the groups was not significant in gender ($P=0.9$, marital status ($P=0.1$), Education ($P=0.7$).

Table 1: Frequency distribution of the subjects based on IBS severity in three stages in three groups

Severity	Group	Time					
		Pre-test		Post-test		Follow up	
		F	%	F	%	F	%
%							
Behavioral-cognitive	Mild (1)	2	16.7	2	16.7	1	8.3
	Moderate (2)	9	75	10	83.3	10	83.3
	Severe (3)	1	8.3	0	0	1	8.3
Mindfulness	Mild (1)	2	16.7	7	58.3	6	50
	Moderate (2)	9	75	5	41.7	6	50
	Severe (3)	1	8.3	0	0	0	0
Control	Mild (1)	1	8.3	0	0	0	0
	Moderate (2)	8	66.7	8	66.7	7	58.3
	Severe (3)	3	25	4	33.3	5	41.7

The severity mean of IBS was approximately the same in three groups and one-way ANOVA didn't show any significant difference while the mean severity in post test and follow up stage was low in the group under mindfulness therapy. In addition

to the study of the descriptive indices based on mean and standard deviation, ROMEIII scores were calculated in pre-test, post-test and follow up stage and the subjects were classified in terms of disease severity into severe, moderate and mild. The required

results are shown in Table 1. As is shown in the table, the severity of the subjects in pre-test were in the same in three groups while in post-test stage, the patients with severe IBS were decreased to zero in two therapy methods.

In two groups of therapy, the mean general scores of life quality in post-test and follow up had great changes in comparison with pre-test while the mean of this variable in control group was fixed in three stages.

In addition to the study of the descriptive indices based on mean and standard deviation of the subjects in life quality index in pre-test, post-test and follow up, the subjects were classified into three groups of high, average and poor life quality

in terms of the life quality scale. The required results are shown in Table 2.

As is shown in the table, the number of the people with average and high life quality were the same in three groups in pre-test stage but they were considerably increased in post-test and follow-up stage.

The mean scores of the subjects in pre-test stage didn't have considerable difference in pre-test stage compared to control groups but this index showed considerable increase in post-test and follow up stage in two therapy groups.

The number of the subjects in pre-test was similar in terms of the type of coping skills in

Table 2: Frequency distribution of the subjects based on life quality scale in three stages in three groups

Life quality	Group	Time					
		Pre-test		Post-test		Follow up	
		F	%	F	%	F	%
Behavioral-cognitive	Poor	2	16.7	1	8.3	2	16.7
	Average	6	50	9	75	7	58.3
	High	4	33.3	2	16.7	3	25
Mindfulness	Poor	0	0	0	0	0	0
	Average	8	66.7	7	58.3	7	58.3
	High	4	33.3	5	41.7	5	41.7
Control	Poor	2	16.7	5	41.7	5	41.7
	Average	10	83.3	7	58.3	7	58.3
	High	0	0	0	0	0	0

Table 3: The results of LSD test

Dependent variable	Group	Group	Mean difference	Significance level
Total symptom post-test	Behavioral-cognitive	Mindfulness	3.631	0.013
	Behavioral-cognitive	Control	-1.505	0.333
	Mindfulness	Control	-5.136	0.002
Total life quality post-test	Behavioral-cognitive	Mindfulness	12.3463	0.004
	Behavioral-cognitive	Control	-16.090	0.001
	Mindfulness	Control	-28.437	0.000

three groups but the emotion-focused subjects were decreased in post-test in both types of therapy and problem-focused patients were increased. However, in follow up stage, in behavioral-cognitive group, the number of the subjects was equal in terms of coping skills but in mindfulness-based therapy, the problem-focused subjects were increased considerably.

The data analysis of hypotheses

First hypothesis: "The effect of therapy methods (MFT, CBT) based on the type of coping skills of the patients with IBS was different in reduction of the clinical symptoms and the increase of life quality".

For the hypothesis analysis MANCOVA test was applied to evaluate the interaction between the therapy methods and the type of coping skills in linear composition of two dependent variables. It can be said that at first the hypotheses were tested (BOX: $M=25.16, F=1.39, P>0.05$). The non-significance of Box test and Levin test for the homogeneity of the variances supported the MANCOVA hypotheses:

The results of two-way MANCOVA showed that there was a significant difference between two therapy methods and two types of coping skills after the control of the effect of pre-test ($P<0.05$). The results showed that there was no interaction between therapy methods and the type of coping skills. Thus, the first hypothesis is rejected ($P>0.05$).

Second hypothesis

"Mindfulness-based therapy was effective in reduction of the clinical symptoms and increasing life quality of the patients with IBS compared to behavioral-cognitive therapy".

To test this hypothesis, based on two dependent variables and pre-test, one-way MANCOVA was applied. The related results are shown in the following table. It can be said that at first the hypotheses of the test were evaluated (BOX: $M=1.13, F=0.34, P>0.05$). The non-significance of Box test and Levin test for the homogeneity of the variances supported the MANCOVA hypotheses:

The results of one-way MANCOVA test showed that there was a significant difference between three therapy groups after the control of

the effect of pre-test in linear composition of the life quality and severity ($P<0.05$). To determine the difference between therapy methods in all the dependent variables, post hoc comparison was done. The difference between the therapy methods was evaluated in all the dependent variables. One-way ANOVA showed that there is a significant difference between the therapy methods in all the dependent variables after the control of the effect of pre-test ($P<0.05$).

To determine the superiority of the therapy methods in dependent variables, Least Significant Difference (LSD test) was applied. The required results are as following:

As is shown in the table, among two therapy methods, mindfulness-based therapy had important role in increasing the life quality and reduction of IBS clinical symptoms ($P<0.05$) compared to cognitive-behavioral therapy. Thus, the second hypothesis was supported. In other words, mindfulness-based therapy was effective in reduction of clinical symptoms and increasing the life quality of the IBS patients compared to the behavioral-cognitive therapy.

Third hypothesis

Mindfulness-based therapy method compared to cognitive-behavioral therapy

Among two therapy methods, Mindfulness-based method is more effective in increasing the life quality and reduction of clinical symptoms of IBS compared to cognitive-behavioral therapy ($P<0.05$). Thus, the second hypothesis is supported. In other words, Mindfulness-based therapy method was effective in reduction of clinical symptoms and increasing the life quality of the patients with IBS compared to cognitive-behavioral therapy method.

Third hypothesis

Mindfulness-based therapy method compared to cognitive-behavioral therapy had long-term effects in reduction of clinical symptoms and increasing life quality of the patients with IBS". To test this hypothesis, the results of follow-up stage of three groups were analyzed by one-way MANCOVA test and the results are shown in the following table.

It can be said that at first the hypotheses of this test were investigated (BOX:M=11.300, F=1.718, P>0.05). The non-significance of Box test and Levin test for the homogeneity of the variances supported the MANCOVA hypotheses.

The statistical analysis showed that there is a significant difference between therapy methods in follow-up stage in linear composition of the dependent variables (P<0.05).

To determine the efficacy of therapy methods in dependent variables, one-way variance analysis was applied. The statistical results showed that there is a significant difference between therapy methods in follow up stage in reduction of clinical symptoms and improvement of life quality (P<0.05). To determine the difference between therapy methods in follow up stage, Tukey method was used. The results showed that mindfulness-based therapy was effective in reduction of the clinical symptoms and increasing life quality of the patients with IBS compared to behavioral-cognitive therapy". Thus, the third hypothesis is supported (P<0.05). In other words, mindfulness-based therapy method compared to cognitive-behavioral therapy had long-term effects in reduction of clinical symptoms and increasing life quality of the patients with IBS.

DISCUSSION

The first hypothesis of the present study evaluated the "effect of therapy methods (MFT, CBT) based on the type of coping skills of the patients with IBS in reduction of clinical symptoms and increasing life quality. The results showed that although there was a significant difference between two therapy methods and two types of coping skills in reduction of clinical symptoms and increasing the life quality of the patients with IBS, there is no interaction between therapy methods and the type of coping skills. There first hypothesis regarding the evaluation of the adjustment effect of coping skills on therapy methods and reduction of clinical symptoms and increasing the life quality of the patients with IBS. The findings showed that half of the patients with IBS have psychiatric disorders, including depression, panic disorder, generalized anxiety disorder (Spiller *et al.*, 2007, Ljotsson *et al.*, 2011) that lead into the reduction of life quality (Meissner *et al.*, 1997). The

concept of stress refers to the threatening event and evaluation of a person of the existing resources in coping with the event and coping is the cognitive and behavioral attempts to control the threatening positions such as the challenges of disease (Lazarus and Folkman). According to the reports, coping skills deficit is one of the dangerous factors in IBS symptoms severity. The patients with IBS are more reliant upon the passive coping skills and experience psychological disorder (Jones *et al.*, 2006). Indeed, depression and anxiety can directly lead into the application of bad coping process in these patients. The passive coping skills can lead into the increase of physical symptoms and disability of the anxiety in controlling the physical symptoms (Crane and Martin, 2004). Also, coping style (efficient/inefficient-active/passive- problem focused/emotion-focused) can affect psychological outcomes of the disease (e.g. anxiety, depression), social (e.g. absence in workplace, the lack of social participation) and biological (the cause of the disease) (Pellissier *et al.*, 2010). Pellissier *et al.* (2010) showed that the people with positive response to the therapy (IBS+) have consistent coping skills to the disease and apply more problem-focused skills such as social supports compared to the patients with negative response to the therapy (IBS-).

Like Beck cognitive model, the inefficient core beliefs and thoughts with emotional psychological reactions and gastrointestinal symptoms are identified and improved in the patients with IBS (Hunt *et al.*, 2009).

A new approach is shown in all the therapies namely IBS psychotherapy compared to behavioral cognitive approach regarding the mindfulness-based therapy, the recent studies showed that using the meditation mindfulness-based approaches and Acceptance and commitment therapy (ACT) can lead into the reduction of physiological symptoms, emotions and experiential avoidance (Naliboff *et al.*, 2008). (Experiential avoidance is long-term mental suffering and it is applied as a strategy to control special events not being controlled in future and it is one of the passive skills). The interaction between specific anxiety and avoidant behavior leads into the fact that experienced avoidance is the reason of the permanent suffering. Thus, in mindfulness-based metacognition model increasing the metacognitive

awareness is raised (the ability to perceive the personal thoughts and emotion and considering them as temporary events instead of considering them as reality), then it is assumed that increasing metacognitive awareness leads into the reduction of rumination as the repetition of negative thoughts. Therefore, catastrophization, rumination and other symptoms including stress and inefficient coping skills are reduced (Ljotsson *et al.*, 2011, Lackner *et al.*, 2007, Gaylord *et al.*, 2009). The mindfulness-based techniques lead into the reduction of stress and pain symptoms and improvement of the symptoms in fibromyalgia and depression. Based on the results of a study, mindfulness-based therapy leads into the reduction of physiological symptoms of IBS (Gaylord *et al.*, 2009). Mindfulness techniques led into the improvement of life quality and efficient coping skills, reduction of depression and anger (Gaylord *et al.*, 2009).

Based on the theoretical basics, it was expected that an intervening role is considered for coping skills in efficacy of CBT, MFT on reduction of the symptoms and improving the life quality of the patients with IBS. The results of the present study were inconsistent with the above result and although they were effective alone but they didn't have interactive effect.

The second hypothesis

"Mindfulness-based therapy was effective in reduction of the clinical symptoms and increasing life quality of the patients with IBS compared to behavioral-cognitive therapy". The results showed that mindfulness-based therapy was effective in reduction of clinical symptoms and increasing the life quality of the patients with IBS. In other words, although cognitive-behavioral therapy is effective, mindfulness-based therapy is more effective.

Based on the role of CBT and cognitive-behavioral approaches in treatment of IBS (Hunt, *et al.*, 2009; Lackner, 2005; Lackner, 2004; Crask, *et al.*, 2001; Ljotsson, *et al.*, 2010; Daryani, *et al.*, 2010; Blanchard, 2007; Mahvi-Shirazi, 2012; Bunme, *et al.*, 2004). However, all the studies namely the recent studies didn't support CBT efficacy on IBS therapy (Blanchard *et al.*, 2007, Drossman *et al.*, 2000, Reme *et al.*, 2010, Ljotsson *et al.*, 2011). The results of the two recent studies showed the lack of

positive results of CBT therapy for IBS (Reme *et al.*, 2010, Ljotsson *et al.*, 2011). On the other hand, the recent studies showed the efficacy of mindfulness-based therapy on reduction of the symptoms and improvement of life quality of the patients with IBS and the results were consistent with the results of the present study. It seems that considering the new approaches of therapy in treatment of psychosomatic disorder created new approach of psychosomatic disorder. Finally, to determine the efficacy of mindfulness-based therapy, it can be said that in this method, increasing metacognitive mindfulness is raised (the ability to perceive the personal thoughts and emotion and considering them as temporary events instead of considering them as reality), then it is assumed that increasing metacognitive awareness leads into the reduction of rumination as the repetition of negative thoughts. Therefore, catastrophization, rumination and other symptoms including stress and inefficient coping skills are reduced (Ljotsson *et al.*, 2011, Lackner *et al.*, 2007, Gaylord *et al.*, 2009). Indeed, the mindfulness intervention targets maladaptive cognitive coping styles such as catastrophizing, which have been shown in the literature to exacerbate IBS symptoms. Also, using mindfulness skills such as breathing mindful, mindful eating and other daily activities lead into the reduction of IBS symptoms as different with what is occurred in CBT. The most important reason for the lack of stability of the results of CBT in cognitive studies regarding IBS is that all of them are focused on inefficient attitudes and not studies have been done about core beliefs (Lackner and Gurtman, 2005). The beliefs motivate the negative thoughts and it exacerbates the gastrointestinal problems as some of the patients complain about the severity of the symptoms at the final sessions. Based on the third hypothesis, "Mindfulness-based therapy method compared to cognitive-behavioral therapy had long-term effects in reduction of clinical symptoms and increasing life quality of the patients with IBS". The results showed that Mindfulness-based therapy was more effective in reduction of the symptoms and life quality in follow up stage compared to cognitive-behavioral therapy method. Thus, besides the efficacy of mindfulness-based therapy at the end of the therapy, it had long-term effects compared to behavioral-cognitive therapy. Regarding the life quality subscales, social reaction components, interpersonal relations, body image,

intervention in task and avoiding eating were significant and mindfulness-based therapy method was the better. All the studies regarding the long-term effects of behavioral-cognitive therapy on reduction of the symptoms or life quality of the IBS patients showed the lack of efficacy of the therapy in long-term period (Ljotsson *et al.*, 2010, Reme *et al.*, 2010, Moss-Morris *et al.*, 2010, Lackner and Gurtman, 2005, Novick *et al.*, 2002, Camilleri *et al.*, 2000, Mahvi-Shirazi *et al.*, 2012, Solati Dehkordi *et al.*, 2009, Daryani *et al.*, 2010, Kheirabadi *et al.*, 2009). The most important reason for these results and the lack of stability of the cognitive-behavioral therapy results is the lack of evaluation of deep cognitive factors namely the inefficient beliefs and assumptions. Lackner showed that in cognitive studies on IBS, all were mostly focused on inefficient thoughts and no studies had been done about core beliefs. The beliefs motivate the negative thoughts unconsciously and in follow up session, the patients believed that after the end of the treatment, most of them were suffering from pain and diarrhea. Another reason is the role of homework and its importance in cognitive-behavioral therapy. At the final session, the cognitive therapy books were given to the patients and they were asked to identify the inefficient thoughts and bad feelings and record them to continue the follow-up session and this homework is not performed by the patients. Thus, not repeating and doing the homework (behavioral) exacerbate the symptoms in follow up stage. On the

other hand, all the studies regarding the long-term effects of mindfulness-based therapy showed its long-term efficacy (Zernicke *et al.*, 2012, Ljotsson *et al.*, 2011, 2010, Lackner *et al.*, 2007, Gaylord *et al.*, 2011, Gaylord *et al.*, 2009). Indeed, mindfulness-based therapy is a multi-component approach reducing IBS symptoms by mindfulness skills such as mindful breathing, mindful eating and other daily activities (Cramer, *et al.*, 2008). In mindfulness-based therapy, the thoughts are considered as independent and unbiased but general awareness of regular practice is achieved during the therapy. The general awareness is defined as unbiased special method at present time (Kabat-Zinn, 1994). Thus, general mindfulness nature is defined as using selective attention control to form cognitive model of data processing as contradictory with the cognitive model (e.g. being vs. should be) disturbing our life (as depressive self-regulated cognitive model) and it cannot release us of inefficient emotional states (Carlson and Garland, 2005). According to Kabat-Zinn training attention control is to be clear and see clearly acting as transcending. General attention is to know who we are, what we are doing and why we are doing it at all moments. Thus, during the therapy, full attention and concentration will be present and it can remain for a long time. It can be said that this can continue for some months. Thus, mindfulness-based therapy can maintain its effectiveness in the follow up stages.

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