



## The Effectiveness of Cognitive-Behavioral Therapy on Psychological Distress and Self-Efficacy in Patients with Irritable Bowel Syndrome

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### Quantitative Study

#### Abstract

**Background:** It is necessary to help people with irritable bowel syndrome (IBS) to solve the problems related to this disease through recognizing the factors affecting psychological distress and self-efficacy in these individuals. The goal of this study was to see how effective cognitive-behavioral therapy (CBT) is in reducing psychological distress and increasing self-efficacy in patients with IBS.

**Methods:** The current research was a semi-experimental study with a pretest-posttest design, follow-up, and a control group. Patients with IBS who were referred to medical centers in Babol, Iran, in 2019 made up the statistical population of this study; 30 individuals were chosen through convenience sampling based on the study inclusion and exclusion criteria and were assigned to the experimental or control group (15 individuals in each group). A demographic questionnaire, the Kessler Psychological Distress Scale (K10) (Kessler et al., 2002), and the General Self-Efficacy Scale (GSE) were used to collect data. At a significance level of 0.05, the data were analyzed using repeated measures analysis of variance (ANOVA) and the Bonferroni test in SPSS software.

**Results:** In individuals with IBS, CBT was found to be beneficial in reducing psychological distress ( $P < 0.001$ ) and increasing self-efficacy ( $P < 0.001$ ). The favorable effect of CBT on psychological distress ( $P = 0.105$ ) and self-efficacy ( $P = 0.925$ ) persisted at the follow-up stage.

**Conclusion:** Given the beneficial effects of CBT on psychological distress and self-efficacy in patients with IBS, it is suggested that this training method be used in the planning of mental health measures, particularly for patients with IBS.

**Keywords:** Cognitive-Behavioral Therapy; Psychological Distress; Self-Efficacy; Irritable Bowel Syndrome

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## Introduction

Irritable bowel syndrome (IBS) is one of the most common functional digestive disorders characterized by uncertain causes, prolonged and unpredictable periods, and few drug effects (Rafiei, Hosseinabadi-farahani, Aghaei, Hosseinzadeh, Naseh, & Heidari, 2017). Symptoms include non-specific complaints such as nausea, vomiting, abdominal pain, diarrhea, and constipation that cannot be explained by biological or structural abnormalities (Yilmaz, Celebi, Kaya, & Baydur, 2017). The prevalence of this syndrome is 10-20% and it has high economic and human costs for the patients, their families, and society; IBS is the second cause of absenteeism after the common cold and is associated with hospitalization and frequent visits to the doctor and, like depression and chronic kidney disease (CKD), it affects the quality of life (QOL) of patients (Goldwag, Wilson, Ivatury, Tsapakos, & Wilson, 2020).

Psychological distress, which is linked to unpleasant mental states including depression, worry, and tension, is one of the psychological symptoms of IBS patients. Psychological distress is the most important and the second risk factor for a wide range of disorders, including heart failure, cancer, and IBS, and in people with stomas (Jin, Ma, Li, Zhang, & Jimenez-Herrera, 2020). According to recent studies, those who are more distressed have more complaints regarding physical sickness symptoms and have more physical, psychological, and social issues (Repic, Ivanovič, Stanojević, & Trgovčević, 2016). Individuals with IBS have also been found to have high levels of anxiety and sadness (Silva, Duarte, Cruz, de Araujo, & Pena, 2020).

The results of the research by Elfeki et al. (2018) have shown that self-efficacy as a personal coping source can facilitate IBS and cause greater acceptance of this disease. Self-efficacy is a psychological concept derived from Albert Bandura's theory of social learning and emphasizes people's understanding of their skills and abilities in successfully performing a task. In other words, self-efficacy affects perceptions of effective, adaptive, and choice of environment and conditions that people try to achieve (Boutry, Bertrand, Ripoche, Alonso, Bastide, & Prudhomme, 2021).

The psychological consequences of IBS and its treatment have been the subject of many research activities. In this regard, the cognitive-behavioral approach is one of the approaches in psychology that has attracted the attention of researchers and psychologists in recent decades. This approach can help patients minimize the negative psychological effects of their disease. Strong empirical evidence for the application of cognitive-behavioral therapy (CBT) for common psychological problems in physical diseases is completely in line with the provision of new health care and emphasis on experimental support treatments. Cognitive-behavioral models and treatment regimens have been created for a wide range of mental disorders and chronic medical conditions, including IBS, and many of them have been proven beneficial in clinical studies (Kent, Long, & Bauer, 2015).

We believe that this method can be good for enhancing mental health because of the effective function of psychological elements in patients' adaptation, the favorable effects of CBT on psychological distress and self-efficacy, and the aforementioned facts. It can also aid in the creation of a positive environment that boosts self-efficacy and psychological well-being.

## Methods

The goal of this study was to see how effective CBT is in reducing psychological distress and increasing self-efficacy in patients with IBS.

The current research was a semi-experimental study with a pretest-posttest design, follow-up, and a control group. The statistical population included all IBS patients referred to medical centers in Babol, Iran, in 2019. Using convenience sampling method, 30 individuals were selected based on the study inclusion and exclusion criteria. They were randomly assigned to the CBT (n =15) and control groups (n =15) based on the inclusion and exclusion criteria. The required sample size was calculated to be 45 individuals in total based on effect size = 0.40,  $\alpha = 0.95$ ,  $1-\beta$  (err prob) = 0.80 test power, and 10% loss of participants in each group. Patients with IBS (based on medical records) who were 30 to 60 years old, able to participate in treatment sessions, did not have acute psychosis (psychosis) (based on medical records), did not have neurological disorders such as brain injury, stroke, Alzheimer's, or Parkinson's (based on medical records), had reading and writing literacy, and gave an informed consent to participate in the study met the inclusion criteria. The exclusion criteria included absence from more than 2 treatment sessions. The ethical principles taken into consideration included the following: data privacy and confidentiality were observed so that the collected information was only used for this study, respect for dignity and rights, privacy, secrets, and freedom of subjects were also considered. Other ethical principles observed in this study included explaining the research objectives to them, obtaining an informed consent from them, being optional, giving them the right to withdraw from the study at any stage, without the disadvantage of reality therapy based on the theory of choice and treatment of acceptance and commitment, answering their questions, and providing the results to the subjects if they wished. Treatment sessions were also taught to the control group to adhere to ethical norms.

It took 2 and a half months to complete the research. The experimental group received 10 sessions of CBT, while the control group received no training. The experimental group participants and post-test certificates were then photographed, and a follow-up was conducted 1 and a half months after the training courses were completed. Based on Beck's training program, CBT was delivered in 8 weekly 90-minute sessions for 2 months. Table 1 shows the group CBT program.

Age, sex, marital status, level of consumption of alcohol, history of hypertension, diabetes, history of psychiatric disease, and disabling and chronic physical diseases are all included in the researcher-made questionnaire used in the present study.

*The General Self-Efficacy Scale:* The General Self-Efficacy Scale (GSE) (1979) was constructed by Schwarzer and Jerusalem (1995). This scale includes 17 items with 2 separate subscales of general self-efficacy and social self-efficacy, which was decreased to a 10-item scale (GSE-10) in 1981 and has been translated into 28 other languages so far. The items are scored on a 4-point scale ranging from 1 to 4. The minimum and maximum total scores of the scale are 10 and 40, respectively.

**Table 1.** Group Cognitive Behavioral Therapy Program

Sessions	Content
First	Explaining the goals and programs of cognitive-behavioral therapy with a focus on depression, coping strategies, and adaptation by the therapist
Second	Facing depression following abortion
Third	Confrontation with coping action and applying coping strategies in the wake of abortion
Fourth	Confrontation with adaptation in the aftermath of abortion
Fifth	Cognitive restructuring and a deep understanding of depression - creating efficient behavior
Sixth	Cognitive restructuring and deep understanding of coping strategies - creating efficient behavior

Schwartz et al. (Thyo, Emmertsen, Pinkney, Christensen, & Laurberg, 2017) reported that the correlation between this scale and the scores of depression, anxiety, and optimistic attributional style were -0.60, 0.52, and -0.55, respectively, and in the Spanish sample, -0.42, 0.43, and 0.57, respectively.

**Kessler Psychological Distress Scale:** The Kessler Psychological Distress Scale (K10) was constructed by Kessler et al. (2002) to identify mental disorders in the general population. The K10 has 2 versions with 10 questions and 6 questions (Kessler et al., 2002). The items of this scale are scored on a 5-point Likert scale including always (4), sometimes (3), somewhat (2), rarely (1), and no time (0). The overall score of the scale ranges between 0 and 40; higher scores indicate greater psychological distress. Yaghoumi (Aktas & Gocman, 2015) assessed its validity and reliability and reported a Cronbach's alpha coefficient of 0.93 and a ballad and Spearman-Brown reliability coefficient of 0.91.

The Levene's test was used to study the homogeneity of variances, Kolmogorov Smirnov test to evaluate the normality of data distribution, and Box's M test and Mauchly's sphericity test were used to investigate the assumptions of the inferential test. SPSS software (version 22; IBM Corp., Armonk, NY, USA) was used for statistical analysis. The tests had a significance threshold of 0.05.

## Results

The mean  $\pm$  SD age of the participants in the experimental and control groups was  $39.11 \pm 7.80$  and  $40.80 \pm 7.81$  years, respectively. In terms of age, there was no significant difference between the two groups ( $P = 0.448$ ). In terms of gender, the experimental group consisted of 20 (80%) women and 5 (20%) men, while the control group consisted of 18 (72%) women and 7 (28%) men. In terms of gender distribution, there was no significant difference between the two groups ( $P = 0.18$ ).

In the CBT group, the mean QOL and self-efficacy scores increased in the posttest compared to the pretest, as shown in table 2. The results of Box's M, Mauchly's sphericity, and Levene's tests were assessed for adherence to the assumptions before repeating the measuring variance analysis. The homogeneity criterion of the variance-covariance matrixes was not rejected since Box's M test was not significant for any of the research variables. Furthermore, none of the variables were significant in Levene's test, indicating that the premise of equal intergroup variances was not rejected. Finally, Mauchly's sphericity test results showed that this test is also significant for the research variables, indicating that the assumption of equal variances within-subjects (spherical assumption) is not observed ( $P > 0.001$ ); therefore, the Greenhouse-Geisser test was used to investigate the univariate test results for intra-group effects and interactions. Moreover, at a significant threshold of 0.05, the Greenhouse-Geisser test revealed a significant difference in terms of the effectiveness of CBT on QOL and self-efficacy in both experimental and control groups, with a value of 0.18 ( $P > 0.001$ ).

**Table 2.** Mean (SD) of quality of life by groups during the study

Variables	Group	Pretest	Posttest	Follow-up
		Mean $\pm$ SD	Mean $\pm$ SD	Mean $\pm$ SD
Quality of life	CBT	26.43 $\pm$ 4.66	32.56 $\pm$ 3.44	32.11 $\pm$ 2.65
	Control	25.85 $\pm$ 3.26	24.75 $\pm$ 4.45	36.78 $\pm$ 2.66
Self-efficacy	CBT	27.83 $\pm$ 4.72	33.60 $\pm$ 3.40	34.10 $\pm$ 2.77
	Control	27.97 $\pm$ 3.44	28.88 $\pm$ 5.65	28.77 $\pm$ 3.33

**Table 3.** Investigation of the effect of time and group on quality of life and self-efficacy using repeated measures analysis of variance

Variables	Effect	F	P-value	Eta
Quality of life	Time	11.54	0.001	0.23
	Group*Time	42.49	0.001	0.63
	Group	38.01	0.001	0.61
Self-efficacy	Time	10.07	0.001	0.19
	Group*Time	95.12	0.001	0.82
	Group	7.44	0.001	0.18

By repeatedly measuring the QOL variable for the effect of time ( $P < 0.001$ ) and group ( $P < 0.001$ ), as well as ANOVA of the self-efficacy variable for the effect of time ( $P < 0.001$ ) and group ( $P < 0.001$ ), the results presented in table 3 show that ANOVA is significant. This indicates a significant difference between the experimental and control groups in terms of both the QOL and self-efficacy variables during the research stages, illustrating the intervention's effect. The Bonferroni test was performed to look into the differences between the groups, and the findings are shown in table 3.

The experimental group's QOL scores were greater at the posttest stage than at the pretest stage ( $P < 0.001$ ). QOL in the follow-up stage differed significantly from that in the pretest stage ( $P < 0.001$ ), but there was no significant difference between the posttest and follow-up stages ( $P = 0.105$ ). The results revealed that self-efficacy levels in the training group were higher in the posttest stage than pretest stage ( $P < 0.001$ ), and self-efficacy in the follow-up stage differed significantly from that in the pretest stage ( $P < 0.001$ ). However, there was no significant difference in the QOL or self-efficacy between the posttest and follow-up stages ( $P = 0.925$ ), indicating that the benefits of CBT persisted until the follow-up stage.

### Discussion

The goal of this study was to see how effective CBT was at reducing psychological distress and increasing self-efficacy in patients with IBS. The findings showed that CBT improved psychological distress and self-efficacy in patients with IBS. This finding is consistent with that of Smith(Wang, Wang, Zhu, Song, & Jiang, 2016).

To explain this finding, cognitive-behavioral group therapy first allows patients to freely communicate their dysfunctional thoughts and beliefs, and cognitive distortions without fear, before investigating and correcting those thoughts, beliefs, and distortions. Cognitive restructuring, also known as logical empiricism, assists people in identifying the flow of their anxious thoughts and even behaviorally testing their dominant anxiety ideas by applying logical reasoning to evaluate the substance of their anxious thoughts in the face of reality (Tewari, et al., 2015). Therefore, CBT plays an important role in creating or changing cognition and attitude in people.

**Table 4.** The results of the Bonferroni post hoc test for paired comparison of meantime measurement of research variables

Variables	Stages	MD	SE	P-value
Quality of life	Pretest Posttest	5.17	1.04	0.001
	Posttest Follow-up	3.82	1.16	0.001
	Follow-up Follow-up	1.24	0.59	0.105
Self-efficacy	Pretest Posttest	2.34	0.47	0.001
	Posttest Follow-up	3.46	0.78	0.001
	Follow-up Follow-up	0.55	0.66	0.925

MD: Mean Difference; SE: Standard error

In explaining this finding, it can be said that CBT improves patients' self-efficacy. According to the cognitive-behavioral model, what people believe affects their feelings and behaviors. Patients' cognitions and attitudes also have a significant effect on perceived stress. Negative cognitions and attitudes about control of myriads improve perceived stress in the individual. One of the fundamental principles of the cognitive-behavioral model is the mutual impact and interaction between the person's knowledge or beliefs about the disease (thoughts), his/her feelings, his/her behaviors, and his/her relationships with others. Moreover, taking part in CBT sessions and doing the assignments outside the sessions corrects patients' wrong beliefs and improves their self-efficacy (Chen, Teo, Phui, & Saman, 2015). Cognitive-behavioral training emphasizes the importance of acquiring skills and using these skills. During the training, people learn effective behavioral methods in addition to working on negative thinking. The skills they acquire will be valuable resources for them throughout their life. These individuals will gain the ability to make automated thinking and emotions relate to them, as well as evidence for approval and non-approval. Provide their approval and achieve some kind of self-awareness (Wang et al., 2015). Considering that followers of the cognitive-behavioral approach believe that the existence of some common mental errors can impair our interpretation and perception of reality, and subsequently, cause inappropriate moods and behaviors; therefore, cognitive-behavioral training can be effective in improving patients' self-efficacy, depending on their ability to clearly, correctly, and effectively convey their thoughts, feelings, needs, and desires.

One of the study's limitations was that the IBS patients were all from Babol; thus, extrapolating the findings to IBS patients from other parts of the province and country should be done with caution. A questionnaire was employed in this study, which is one of the study's flaws since individuals may have answered the questions under the effect of social desirability. The research was semi-experimental and lacked the advantages of true experimental designs. It is proposed that more studies be performed in a broader geographical area in order to more reliably generalize the findings. Considering that the present study was conducted on the community of IBS patients, in future researches, the class and social basis of the subjects should be considered as an influential variable in the effectiveness of CBT skills training. Considering that the present study was a quantitative research, it is suggested that a qualitative method (grounded theory based on semi-structured interview) be used in future researches. According to the findings of this study, mental health professionals and persons working in the field of health should encourage patients with IBS to improve their mental health by devising and implementing appropriate ways based on CBT training.

## **Conclusion**

It can be concluded from the data of this study that cognitive-behavioral treatment improves psychological distress and self-efficacy in patients with IBS.

## **Conflict of Interests**

Authors have no conflict of interests.

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