



# Evaluation of the Impact of Self-efficacy-based Training on Depression, Self-Care Behaviors, and Quality of Life in Patients with Irritable Bowel Syndrome

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## Abstract

**Background and Objective:** Irritable bowel syndrome is the most common diagnosis among patients with gastrointestinal diseases and can adversely affect their quality of life. In this regard, the present study aimed to evaluate the effectiveness of self-efficacy-based training on depression, self-care behaviors, and the quality of life of patients with irritable bowel syndrome.

**Materials and Methods:** This applied quasi-intervention study was conducted based on a pretest-posttest design with a control group and follow-up. The statistical population included all patients with irritable bowel syndrome who referred to Khorshid Hospital in Isfahan, Iran from September to November 2019. The samples were selected using the convenience sampling method. In total, 30 patients with irritable bowel syndrome were included in the study and randomly divided into two groups of intervention and control. The data were collected using Beck depression inventory, self-care questionnaire, and quality of life questionnaire. The intervention group received four sessions of self-efficacy training (one session per week for 90 min), while the control group did not receive any training. Two months later, the follow-up period was completed. The collected data were analyzed using repeated measures of analysis of variance in SPSS software (version 22).

**Results:** The results showed that self-efficacy training was effective in decreasing depression ( $P < 0.0001$ ,  $F = 35.39$ ) and increasing quality of life ( $P < 0.0001$ ,  $F = 120.30$ ) and self-care behaviors ( $P < 0.0001$ ,  $F = 70.50$ ) in patients with irritable bowel syndrome.

**Conclusions:** It can be concluded that training based on self-efficacy theory can effectively reduce depression and increase self-care behaviors and quality of life in patients with irritable bowel syndrome.

**Keywords:** Depression, Irritable bowel syndrome, Quality of life, Self-care, Self-efficacy



## Background

Irritable bowel syndrome is the most common diagnosis among patients with gastrointestinal diseases and accounts for 25-50% of cases referred to gastroenterologists [1]. Anxiety and depression are common among these patients and are strongly associated with the onset and severity of symptoms. Irritable bowel syndrome is a problem that mainly affects the large intestine [2].

Nowadays, evaluation of the quality of life is an essential part of medical evaluation and health status assessment of patients with irritable bowel syndrome [3] since the quality of life is an important concept among these patients. It is considered a multidimensional concept, including physical, psycho-social, and recovery functions. Chronic complications of irritable bowel syndrome, reduced life expectancy, and mortality caused by it impose much economic burden on the patients and their

families [4].

One of the major goals of controlling irritable bowel syndrome is to empower patients to self-care [5]. Irritable bowel syndrome is a chronic disease that requires lifelong self-care behaviors. Effective management of this syndrome needs complex self-care behaviors, such as lifestyle changes, nutrition intake control, regular exercise, medications, control and measurement of the glucose level, and foot care [6-8].

According to the results of the previous research performed on the relationship between psychosocial factors and irritable bowel syndrome, subjects with irritable bowel syndrome had higher levels of depression, anxiety, and neuroticism, compared to healthy people [9]. Results of a study conducted by Pinto et al. [10] also indicated that 50% of people with irritable bowel syndrome suffer from anxiety

and depression.

In addition, some patients with this syndrome who referred to subspecialty centers suffer from anxiety, depression, phobia, and somatization. These patients rarely have complete symptoms of mental disease. Moreover, those patients with irritable bowel syndrome who have not referred to a hospital cannot be distinguished from healthy people in terms of mental health problems [11]. Patients with irritable bowel syndrome are likely to have been physically or sexually abused in the past or have a learned behavioral pattern from childhood. Based on the findings of a study, these patients showed more neurosis compared to healthy people [12].

Learning principles as well as human behavior theories and models provide a framework for understanding how people learn and behave; moreover, they are the basis of effective behavior change interventions [13]. Health education professionals must apply a variety of theories to complete educational strategies. They are recommended to apply the most relevant theories based on the spatial and temporal conditions of the patients [14,15]. Cong et al. [16] performed a study titled "The effect of self-efficacy interventions in people with irritable bowel syndrome: A systematic review study". They found strong evidence regarding the impact of self-efficacy interventions on the improvement of short-term symptoms and quality of life; however, the long-term results were different.

Results of a study conducted by Shahabi et al. [17] showed that self-efficacy therapy led to improvement after the treatment. The number of patients with irritable bowel syndrome is growing and they have major problems with depression and self-care behaviors. However, it seems that many of these patients do not have enough knowledge and skills to properly manage such problems.

### Objectives

The present study aimed to evaluate the effect of training based on self-efficacy theory on depression, self-care behaviors, and the quality of life of patients with irritable bowel syndrome.

### Materials and Methods

The present applied quasi-intervention study was conducted based on a pretest-posttest design with a control group and follow-up. The statistical population of this study included all patients with irritable bowel syndrome who referred to Khorshid Hospital in Isfahan, Iran between September and November 2019. First, 30 out of 61 patients with irritable bowel syndrome were selected based on

inclusion and exclusion criteria. Afterward, they were randomly allocated to intervention and control groups. The training sessions were held at Khorshid Hospital.

The samples were selected using the purposeful sampling method. The sample size was calculated at 30 people by using G\*Power software (version 1.3.9.2) (without the need for formula and by specification of the statistical tests, test power,  $\alpha=0.05$  error, and  $\beta=0.80$  error). The inclusion criteria were 1) diagnosis of irritable bowel syndrome based on the criteria of Rome II [18] by a gastroenterologist, 2) lack of receiving psychological treatment during the last three months, 3) no severe psychiatric diseases among first-degree family members, and 4) a family history of colon cancer. Exclusion criteria were symptoms, such as gastrointestinal bleeding, blood in the stool, absence from more than two sessions of training sessions, and hospitalization during the study period.

Ethical considerations of the present study were as follows: 1) all individuals received written information about the research and participation was voluntary, 2) the subjects were ensured that all of their information would remain confidential and be used only for research purposes, 3) the first and last names of the participants were not registered to keep their information confidential, and 4) all questionnaires were completed with the help of the researcher to ensure that they are filled correctly. The researcher also provided the intervention for the control group at the end of the study to comply with ethical principles.

This research was conducted after obtaining the permission from Research Deputy of Hormozgan University of Medical Sciences (code of ethics: IR.HUMS.REC.1398.311). Moreover, it was confirmed by the Clinical Trials Registration Center, Iran (code: IRCT20191217045761N1).

### Beck Depression Inventory

The second edition of the Beck Depression Inventory [18] was developed to assess the severity of depression and complies with DSM-IV depression criteria. The questionnaire consists of 21 items that are scored based on a four-point Likert scale ranging from 0 to 3. It should be mentioned that the total score ranges from 0 to 63, and high scores indicate more severe depression. The cutoff point in the Beck Depression Inventory is 13.

Test-retest reliability with a one-week interval was obtained at 0.93 and its internal consistency was obtained at 0.91 by Cronbach's alpha [18]. Cronbach's alpha method was used to investigate the internal consistency and the alpha coefficient of

**Table 1.** Description of self-efficacy training sessions

Sessions	Description of sessions
Session 1	Information was given to raise awareness, and training packages were provided for learners. The learners were asked to share their successful experiences regarding health-promoting behaviors for other participants (success in performance). Observational learning and modeling were strengthened, successful people in terms of health-promoting behaviors were asked to share their experiences with others. For this purpose, for example, a person who was successful at stress management was invited to share his/her experiences with others as a role model and answer questions of other health volunteers participating in the class (experiences of success and role modeling).
Session 2	To motivate verbal encouragement in theoretical sessions, learners who participate in the discussion received encouragement. Personal counseling was also provided to encourage learners who were not very successful in performing health-promoting behaviors to perform these behaviors. The participants were asked to make their decisions in smaller and more accessible steps.
Session 3	To have physiological states that could help learners increase their sense of self-efficacy, people were allowed to express their thoughts and feelings while doing physical activity following a healthy diet, and performing stress management practices.
Session 4	

0.90 was obtained for the whole questionnaire [19]. Cronbach's alpha of this questionnaire was obtained at 0.74 in the present study.

### Self-care Questionnaire

A 13-item questionnaire prepared by Alizadeh Aghdam et al. [20] was used to investigate the level of self-care. This questionnaire included various aspects, namely healthy nutrition (3 items), physical activity (2 items), stress management (3 items), tobacco consumption (2 items), and awareness and responsibility for health status (3 items). This questionnaire is scored based on a five-point Likert scale ranging from 1 to 5. The lowest and highest scores of this questionnaire were 13 and 65, respectively. The score ranges of 13-29, 31-47, and 48-65 on this questionnaire indicate low, moderate, and high levels of self-care, respectively. This tool had good reliability and its Cronbach's alpha was obtained at 0.83 [21]. In the present study, Cronbach's alpha of this questionnaire was obtained at 0.83.

### Quality of Life Questionnaire

This self-report questionnaire, mainly used to assess the quality of life and health, was developed by Ware and Sherbourne [22] and consists of 36 items. It assesses eight domains of physical functions, social functions, physical role-play, emotional role-play, mental health, vitality, physical pain, and general health. Scores of the subjects in each of these domains vary between 0 and 100, and higher

scores indicate higher quality of life. Validity and reliability of this questionnaire were confirmed in Iran and the coefficients of internal consistency of its eight subscales were reported between 0.70 and 0.85. Moreover, the test-retest coefficients of the subscales with one-week interval were reported at 0.43-0.79 [22].

Cronbach's alpha of this questionnaire was obtained at 0.77 in the present study. The training intervention was implemented based on the protocol of the self-efficacy theory of Stajkovic, Bandura, Locke, Lee, and Sergent [23] in five 60-min training sessions. These sessions included lecture, question and answer, group discussion, and individual counseling methods (Table 1).

In the descriptive statistics section, frequency tables and charts as well as central and distribution indices, such as mean and standard deviation values, were calculated. In the inferential statistics section, the MANCOVA method and repeated measures of variance analysis were used. The above-mentioned statistical analyses were performed in SPSS software (version 22).

### Results

The findings were analyzed using descriptive statistics, including mean, standard deviation, number of subjects, frequency table, and percentage. The results of the analysis are summarized for all variables of the study in the following tables (tables 1 and 2).

Since the results of Box's M test were not significant

**Table 2.** Frequency distribution and comparison of demographic characteristics of research subjects

Demographic variables	Intervention	Control	p-value	
Gender	Female	6 (40)	4 (26.7)	0.33
	Male	9 (60)	11 (73.3)	
Marital status	Single	0 (0.0)	1 (6.7)	1.00
	Married	15 (100)	14 (93.3)	
Age	Under 30 years old	1 (6.7)	0 (0.0)	0.43
	30-39 years	10 (66.7)	10 (66.7)	
	40-49 years	4 (26.7)	5 (33.3)	
Education level	Illiterate	1 (6.7)	0 (0.0)	0.08
	Diploma	11 (73.3)	14 (93.3)	
	Associate's degree	2 (13.3)	0 (0.0)	
	Master's degree	1 (6.7)	1 (6.7)	

**Table 3.** Mean and standard deviation of research variables in the intervention and control groups

Variable	Group	Pre-test		Post-test		Follow-up	
		Mean	SD	Mean	SD	Mean	SD
Depression	Intervention	13.66	1.29	11.60	1.18	12.06	1.38
	Control	12.73	1.27	12.20	1.26	12.80	1.20
Quality of life	Intervention	159.86	4.74	165.53	4.12	164.80	4.02
	Control	160	4.59	160.53	4.70	160.46	4.77
Self-care	Intervention	28.06	4.43	31.80	4.31	31.13	4.42
	Control	30.60	4.13	31.26	4.00	31.46	3.96

for any of the research variables, the homogeneity of the variance-covariance matrices was confirmed. Moreover, the lack of significance of any of the variables in Levene's test showed that the intergroup variances and the level of variance of the dependent variable error in all groups were equal. Finally, the examination of the results of Mauchly's test of sphericity indicated that this test was significant for the variable of quality of life; hence, assumption of the equality of intra-subject variances (sphericity assumption) has not been observed (Mauchly's  $W=0.39$ ;  $d=2=0.001$ ;  $P=0.31$ ). The Lambda Wilkes test with a value of 0.12 and the  $F=95.32$  showed a significant difference between the effectiveness scores of self-efficacy theory training on the improvement of depression, quality

of life, and self-care in the intervention and control groups with a significance level of 0.0001.

According to Table 4, the score of depression in the post-test stage in the intervention group is less than that of the pre-test stage in the control group (lower scores in the post-test stage indicate lower levels of depression). In other words, the self-efficacy intervention was highly effective in the improvement of depression. The results also indicated that depression in the follow-up stage in the self-efficacy theory training group decreased significantly, compared to the post-test stage in the control group. In addition, the score of quality of life at the post-test stage was higher in the intervention group, compared to the control group.

**Table 4.** Results of Bonferroni post-hoc test for comparison of research variables

Variable	Group	Stages	Post-test	Follow-up
Depression	Self-efficacy theory training	Pre-test	30.1*	0.76*
		Post-test	-	-0.53*
	Control group	Pre-test	0.09	0.12
		Post-test	-	0.05
Quality of life	Self-efficacy theory training	Pre-test	-3.10*	-2.70*
		Post-test	-	0.40*
	Control group	Pre-test	-0.03	-0.07
		Post-test	-	0.05
Self-care behaviors	Self-efficacy theory training	Pre-test	-2.20*	-1.96*
		Post-test	-	0.23
	Control group	Pre-test	-0.06	-0.08
		Post-test	-	-0.11

## Discussion

Based on the obtained results, the self-efficacy theory training has been highly effective in the improvement of depression. The results also revealed that depression in the follow-up stage in the self-efficacy theory training group decreased significantly, compared to the control group. These results were in line with those of the research conducted by Cong et al. [16] and Shahabi et al. [17]. In explaining these results, it can be stated that self-efficacy is a factor that causes a kind of self-confidence, self-esteem, and courage in a person. Therefore, it leads to more participation in social interactions and increases the level of social skills of people. Within the cognitive-social approach framework, Bandura considers self-efficacy as one's belief in their abilities in the performance of certain activities [24].

In this regard, according to Bandura, self-efficacy is

one of the most important factors in the development of healthy social communication that makes life enjoyable and empowers people to cope with long-term pressures. Based on Bandura's theory, high self-efficacy helps to create a sense of relaxation in the face of difficult problems, and vice versa, people with low self-efficacy suffer stress, anxiety, and depression in difficult situations, which weakens their thinking and performance abilities [25-28].

Effectiveness of self-efficacy training on self-care behaviors could be explained by saying that such skills help people cope more effectively with stressful situations. Accordingly, in the face of problems, they try to reduce their stress and focus on their abilities and capabilities to create a happier and healthier life. Since this program targets maladjusted cognitive styles and information process biases that are related to the self-care of



people with irritable bowel syndrome, it will improve their self-care [29].

Furthermore, self-efficacy increases the use of problem-oriented coping responses in patients with irritable bowel syndrome and leads to the positive review and re-assessment of emotion regulation [30]. Self-efficacy training provides a belief in one's abilities and an optimistic philosophy in life. It is one of the constructive elements of action that restores belief and gives people the courage to do the work and makes them aware of their values and strengths through encouragement [31].

Results of this study are limited to patients with irritable bowel syndrome since it was conducted only on the patients with irritable bowel syndrome in Isfahan and caution should be exercised in generalizing the results to other regions and cities. It is recommended that this type of study be conducted on another sample group and its results be evaluated and compared with those of this study. It is also suggested that this type of study be performed in other cities and its results be evaluated. Moreover, it is recommended for future studies to provide follow-up in the form of personal counseling after the group training.

## Conclusions

It can be concluded that intervention based on self-efficacy theory is effective in reducing depression and increasing self-care behaviors and quality of life in patients with irritable bowel syndrome.

## Compliance with ethical guidelines

All ethical principles were considered in this research; accordingly, the participants were informed about the purpose of the research and its stages. Besides, written informed consent was obtained from the subjects, and they were also assured of the confidentiality of their information. Moreover, the subjects were free to withdraw from the study at any time. They were also informed that they would be provided with the results of the research.

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## Authors' contributions

Conceptualization: Fakhrialsadat Khalifesoltani; Methodology: Kobra Hajjalizadeh; Investigation: Kobra Hajjalizadeh; Writing of the Original Draft: Fakhrialsadat Khalifesoltani; Writing of the Review and Editing: All Authors; Funding Acquisition: All Authors; References: All Authors; Supervision: Hasan Ahadi.

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## Conflicts of Interest

The authors declare that they have no conflict of interests.

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