

**Mediating role of self-care in predicting self-control and outcome expectations based on health anxiety in patients with irritable bowel syndrome**Moghgan Momeny,<sup>1</sup> Maryam Bahrami Hidaji,<sup>\*2</sup> Zohreh Rafezi<sup>3</sup>**Abstract**

**Introduction:** Irritable bowel syndrome is one of the most expensive diseases of the digestive system that causes intestinal dysfunction. The purpose of this study was to investigate the mediator role of self-care in predicting self-control and outcome expectations based on health anxiety in patients with irritable bowel syndrome.

**Research method:** The current research is descriptive and path analysis type. The statistical population of this research was made up of all patients with irritable bowel syndrome who referred to medical centers in Tehran. The sampling of the current research is purposeful and 200 patients with irritable bowel syndrome completed the research questionnaires. Research tools included Tobert and Glasgow's self-care questionnaire, Tanji's self-control questionnaire, Vosichki et al.'s outcome expectations questionnaire, Salkoskis and Warwick's health anxiety questionnaire. SPSS-26 and AMOS software were used for data analysis.

**Findings:** The results showed that health anxiety predicts both directly and through the mediation of self-care, self-restraint and expectation of outcome in patients with irritable bowel syndrome. Also, self-care predicts self-control in patients with irritable bowel syndrome. Self-care predicts expected outcomes in patients with irritable bowel syndrome.

**Conclusion:** As a result, it is recommended that every hospital has a health psychologist as a person who can teach patients how to control anger, courage, skills in saying no, or even training to deal with stressful situations so that they can live a just life. Use these skills.

**Keywords:** health anxiety, irritable bowel syndrome, outcome expectations, self-care, self-control

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## Introduction

Functional gastrointestinal disorders are a group of psychosomatic diseases that are characterized by unclear causes, questionable diagnostic criteria, long-term and unpredictable disease courses, and little drug effects (1). Among the 25 functional gastrointestinal disorders, irritable bowel syndrome is the most common, costly and debilitating type of them (2). Psychological factors may also play a role in the persistence and severity of the abdominal symptoms of this syndrome, and under the influence of these factors, people with irritable bowel syndrome refer to health care centers to an extreme extent (3). As an example, the results of Roshan, Yarahmadi and Parhizkar's research (4) showed that the level of flexibility and resilience in patients with irritable bowel syndrome is lower compared to normal people. Psychological flexibility refers to the level of experience of a person in front of internal and external experiences. This personality trait exists in different people to different degrees and determines the type of reaction of people to new experiences (5).

This syndrome, which accounts for 28% of referrals to gastroenterologists, is currently diagnosed based on symptom-based criteria such as the Rome criteria; based on which there should not be any organ disorders in the digestive system and the last stage of this disease actually occurs with chronic, recurring abdominal discomfort and change in bowel habits. Depending on the clinical reports, many treatments have been proposed, and its peak prevalence is in early adulthood, and the proportion of women is higher than men (6). The prevalence of irritable bowel syndrome worldwide is between 1 and 20%. This disease is the most common diagnosis among gastrointestinal disorders and accounts for 25-50% of referrals to gastroenterologists. Therefore, IBS creates a significant burden for the individual in the society and can severely disrupt the quality of life of the affected people. (7).

One of the possible consequences during the outbreak of IBS can be the lack of self-care. Self-care is the practice of behaviors that increase well-being, coping with work-related stress, and strengthening resilience. Self-care is one of the skills that improves health, improves the quality of life and has a significant impact on reducing costs. By continuing to practice self-care, acute and chronic complications of diseases can be prevented or delayed. The main aspect of self-care is participation and acceptance of responsibility on the part of the individual to prevent the occurrence of diseases in the individual by performing the correct health-oriented behaviors. According to Pender's theory, health-promoting behaviors include any measures taken to increase and maintain the level of health and self-improvement of an individual or group. (8) which was updated in 2016 as "RAM version 4" (7).

Among the psychological structures that can act as a shield against the disease during disease outbreak is self-inhibition. Self-control is the ability to manage one's impulses, emotions and behaviors to achieve long-term goals. Self-control is primarily rooted in the prefrontal cortex. The problem-solving and decision-making planning center of the brain, which is significantly larger in humans than in other mammals, the richness of neural connections in the prefrontal cortex enables

people to plan, evaluate alternative actions, and ideally avoid doing things you will regret later rather than responding immediately to any impulse that arises. (taken from today's psychology magazine). Self-control can be seen as a main aspect in adaptive human behavior. If we learn how to say "no" to temptations, we can achieve success better. However, recent theorists overestimate the power of will (9), on the other hand, the capacity for self-control is one of the most useful and efficient human capabilities. Self-control is the ability to change and adapt oneself in such a way that optimal harmony between the person and the environment is established, and the maximum amount of happiness and satisfaction is achieved. Self-restraint is manifested in four areas: control of thoughts, feelings, impulses and performance. Self-restraint people have less problems in controlling their impulses and show more psychological adjustment and less pathological symptoms. (10).

Expectations of the outcome is another factor influencing the spread of IBS, which is the beliefs about the consequences of behavior that depend on the experience, personal beliefs, self-efficacy and the quality of a person's ability, and the person wants to perform a behavior that brings more positive results. Outcome expectations can change to motivation when faced with favorable conditions such as family support, government support, etc. (11) Outcome expectations are considered as part of Bandura's main social-cognitive theories. Judging the possible consequences of a given task, positive outcome expectations act as incentives that promote future behavior. Many behavioral theories that are used in health promotion do not consider the maintenance of behavior but focus on the initiation of behavior, which is the real goal of public health. Consequence expectations refer to the predicted consequences of a person's behavior. Outcome expectations make us evaluate the results of the performed action, for example, the expected benefits of a facility, better quality of life and new job opportunities, can improve the public level. (12) The results of some studies indicate that due to the important role of physical health in people's lives, most of them have had concerns about their health at some time. Health anxiety is a disorder characterized by great anxiety and fear about having a serious illness; Therefore, the main problem in this disorder is anxiety, the form of which is different from other anxiety disorders. (13)

Illness anxiety disorder, sometimes called hypochondria or health anxiety, is worrying excessively that you are or might become ill. You may experience intense anxiety when body sensations, such as muscle cramping or fatigue, are associated with a specific, serious illness. Health anxiety disorder is a long-term condition that can fluctuate in severity. Illness anxiety disorder usually begins in middle or early adulthood and may worsen with age. Often for older adults, health anxiety may focus on fear of memory loss. (14) There are people who, without being in danger or suffering from a particular disease, experience severe anxiety and worry about their physical health and consider simple physical symptoms as a serious illness, these people have health anxiety. (15).

The high prevalence of chronic diseases, stress, anxiety, uncertainty about the disease, and low quality of life, the cycle of "guilt" in these patients, causes numerous financial, job, marital, etc. problems. So that the person overestimates his illness and does not see the possibility of adapting

to it. After all, the costs that are imposed on the insurance service systems, the individual and the government, doubles the need to pay more attention to these diseases and proper treatment. Acknowledging the above and considering the numerous psycho-social consequences caused by irritable bowel syndrome, the main research question is whether the mediation role of self-care in predicting self-restraint and outcome expectations based on health anxiety in patients with Is irritable bowel syndrome predictable?

### **Method:**

The current research is descriptive and of path analysis type. The statistical population of this research was made up of all patients with irritable bowel syndrome who referred to medical centers in Tehran. The sampling of the current research is purposeful and 200 patients with irritable bowel syndrome completed the questionnaire. The characteristics of the patients include men and women with irritable bowel syndrome. Exclusion criteria include addiction, psychological illness with a history of bereavement in the past year, and the use of psychoactive drugs. Research tool:

**Self-care questionnaire:** This tool was developed to measure self-care by Tobert and Glasgow in 2000. This questionnaire includes 8 questions in the field of demographic variables and 17 questions in the fields of dental care, vaccination, visiting a doctor, food plan, adherence to treatment and physical activity. Out of all the above questions, 10 questions are in the form of multiple options, if each option is selected by the person, a score of 1 and if not selected, a score of zero is awarded. 17 questions are also considered as five options (never, rarely, sometimes, often, and always) and each statement is assigned a score between one and five. The overall score of the questionnaire is taken from the scale of 100. The validity of the content of the questionnaire was checked using a qualitative method using the opinion of relevant experts and the review of the texts, considering all aspects of the subject. Some units (homogeneous and non-participating in the study) also checked the face validity of the questionnaire in the preliminary study. The reliability of the tool was also measured using the internal consistency method ( $\alpha=0.77$ ). The method of calculating the health literacy score is sufficient (5.83 and above), borderline (5.83 to 65.5), insufficient (0.5-65) and the method for calculating the self-care score with the maximum and minimum strong score (76 -48), average (24-47), weak (0-23). According to the results obtained from other studies, regarding the measurement of health literacy of Iranians, who estimated the literacy rate to be 55.4%, taking into account the confidence level of 95% and the relative error level of 5%, we examined 200 people in this study.

**Self-control questionnaire:** This instrument was developed to measure self-control by Tanjeni, Bamister and Boone in 2004. It has 36 items, the answers to which are arranged in a 5-point Likert scale (not at all similar = 1, to very similar = 5). The range of scores is between 36 and 180, with higher scores indicating higher levels of self-control. Tanji et al reported Cronbach's alpha reliability coefficient in two separate studies among students of 83% and 89%, respectively, which indicates good internal consistency. Mousavi Moghadam, Hori, Amiri, Zahiri (16) have reported a significant coefficient of convergence validity of the questionnaire with the scale of optimal

emotional responses. In a study among graduate students, Atash Afrooz (17) reported the mean equal to 0.64 using the two-halving method.

**Outcome expectations questionnaire:** This tool was developed by Dusichki et al. It includes 15 items and three components of expectations of physical-psychological consequences (items 1 to 6), expectations of social consequences (items 7 to 10) and expectations of self-evaluation consequences (items 11 to 15) based on a five-level scale. Likert is scored from completely successful (score 5) to completely disagree (score 1). In the research of Khajovi and Sohrabi Dehaghani (18), Cronbach's alpha coefficients of physical, social and self-evaluation components and the whole scale were obtained as 83.0, 84.0, 83.0, and 87.0 respectively. Also, the construct validity and internal stability of the questionnaire were reported to be favorable.

**Health anxiety questionnaire:** This tool was developed to measure health anxiety by Salkoskis and Warwick in 2002. This questionnaire consists of 18 questions and has three factors namely disease, disease consequences and general health concerns. The validity of the questionnaire was obtained by Cronbach's alpha method and its construct validity was obtained by exploratory factor analysis using SPSS software. The results showed that the construct validity of this questionnaire includes three factors of disease, disease consequences and general health concern. Likewise, Cronbach's alpha coefficient with a value of 0.75 showed the validity of the questionnaire. The results indicate that Salkoskis and Warwick's health anxiety questionnaire is adequate for diagnosing health anxiety and can be used in various researches and medical centers.

**Ethical considerations of research:** In order to comply with the ethical principles of the research in order to protect the rights of the subjects, the necessary clarifications regarding the objectives of the research and the procedure of its implementation were presented to all the subjects. The absence of coercion and the right to participate or not to participate in the research was specified for all participants. Also, all of them were assured that the obtained personal information will remain confidential and that the data that will be published will be analyzed in a group form without personal identification. After obtaining oral consent and consent, self-report questionnaires were distributed among the subjects and collected after completion.

**Analysis of data:** In this research method, after filling the questionnaires by the patients, data analysis be done with the help of SPSS26 and AMOS software. The research findings are reported in two parts, descriptive and inferential. In the descriptive part, frequency, percentage, mean and standard deviation are used, and in the inferential part, data analysis be done using the structural equation modeling method. Finally, the model fit test will be done using AMOS software.

### Findings:

Table 1. Average, standard deviation and Cronbach's alpha coefficients of health anxiety (probability of contracting the disease and negative consequences of contracting the disease), self-care, self-restraint and outcome expectations (physical/psychological consequences, social consequences and self-evaluation consequences) is showing.

**Table 1 mean, standard deviation and Cronbach's alpha coefficient of the variables**

Variable	average	Standard deviation	Cronbach's alpha
Health anxiety - the possibility of contracting a disease	14/19	3/73	0/81
Health anxiety - negative consequences of disease	3/91	1/04	0/63
Self-care	57/09	11/69	0/84
self-control	82/62	14/48	0/89
Outcome expectations - physical/psychological outcomes	20/52	5/74	0/81
Consequence Expectations - Social Consequences	15/43	3/44	0/68
Consequence expectations - consequences of self-evaluation	15/40	4/20	0/77

In addition to the mean and standard deviation of the research variables, Table 1 shows the Cronbach's alpha coefficients of the research variables, based on which the Cronbach's alpha coefficients of all research variables and components are close to or greater than 0.7. This issue indicates that the items of each questionnaire used to measure the components and variables of the research have an acceptable internal similarity. Table 2 shows the correlation matrix of research variables.

**Table 2 Correlation matrix of research variables**

Variable	1	2	3	4	5	6
Health anxiety - the possibility of contracting a disease	-					
Health anxiety - negative consequences of disease	0/51**	-				
Self-care	0/24**	0/41**	-			
self control	0/21**	0/28**	0/32**	-		
Outcome expectations - physical/psychological outcomes	-0/26**	-0/18*	0/35**	0/30**	-	

Consequence Expectations - Social Consequences	0/22**	0/35**	0/19*	0/17*	0/62**	-
Consequence expectations - consequences of self- evaluation	-0/37**	-0/24**	0/44**	0/23**	0/68**	0/73**

\*\*P>0/001- \*P>0/05

Table 2 shows the correlation coefficients between research variables, based on which the direction of correlation between variables was in line with the researcher's expectation.

In order to evaluate the normality of the distribution of single-variable data, the skewness and skewness of each variable were examined, the results of which can be seen in Table 3.

**Table 3: Stretch and skewness of research variables**

Variable	crookedness	stretch
Health anxiety - the possibility of contracting a disease	0/41	1/05
Health anxiety - negative consequences of disease	1/21	0/64
Self-care	-0/42	-1/02
self-control	-0/20	-0/92
Outcome expectations - physical/psychological outcomes	-0/80	0/21
Consequence Expectations - Social Consequences	-1/10	0/78
Consequence expectations - consequences of self-evaluation	-0/56	-0/43

Table 3 shows that the skewness and skewness values of all variables are in the range of  $\pm 2$ . This article shows that the distribution of data related to research variables do not show any obvious deviation from univariate normality (16).

The assumption of collinearity was investigated with the help of Variance Inflation Factor (VIF) and tolerance coefficient values, the results of which can be seen in Table 4.



**Table 4: Inflation factor, variance and tolerance coefficient of predictor variables**

Variable	tolerance coefficient	VIF
Health anxiety - the possibility of contracting a disease	0/88	1/14
Health anxiety - negative consequences of disease	0/92	1/09
Self-care	0/94	1/07

The above table shows that the assumption of collinearity among the data of the current research is maintained. Because the tolerance coefficient values of all predictor variables were greater than 0.1 and the variance inflation factor values for each of them were less than 10. According to Mirz et al.'s (2006) point of view, the tolerance coefficient less than 0.1 and the value of the variance inflation factor higher than 10 indicate the non-establishment of the assumption of collinearity among the research data.

**Table 5 structural model fit indices**

Indicators suitability	Structural model
Square K	13/60
DF	11
$\chi^2/df$	1/24
GFI	0/979
AGFI	0/916
CFI	0/993
RMSEA	0/036

Table 5 shows that all fit indices support the acceptable fit of the structural model with the collected data ( $\chi^2/df = 1.24$ , CFI=0.979, GFI=0.993, GFI=0.916 AGFI and RMSEA = 0.036). Thus, the first hypothesis was confirmed and it was concluded that the structural model of the research fits the collected data. Table 6 shows the direct and indirect path coefficients between research variables in the structural model.



**Table 6:** direct and indirect path coefficients between the research variables in the research model

routes	b	S.E	$\beta$	sig
Health anxiety → Self-care	1/863	0/416	0/507	0/001
Self-care → waiting for the outcome	0/097	0/038	0/473	0/001
Self-care → self-control	0/259	0/091	0/263	0/033
Coefficient of the direct path of health anxiety → outcome expectation	-1/281	0/325	-0/568	0/001
Coefficient of the direct path of health anxiety → self-control	1/351	0/693	0/226	0/038
Indirect path coefficient of health anxiety → waiting for the outcome	0/181	0/056	0/240	0/001
Indirect path coefficient of health anxiety → self-control	0/483	0/129	0/134	0/001

In the following, the second to seventh hypotheses of the research have been tested based on the results of the above table:

Second hypothesis: self-care predicts self-control in patients with irritable bowel syndrome. Table 6 shows that the path coefficient between the variable tail of self-care and self-control ( $p=0.033$ ,  $\beta=0.263$ ) is positive and significant. Thus, in testing the second hypothesis of the research, it was concluded that self-care predicts self-restraint in a positive and meaningful way in patients with irritable bowel syndrome.

The third hypothesis: self-care in irritable bowel syndrome patients predicts outcome expectation. Table 6 shows that the path coefficient between self-care and outcome expectation ( $p=0.001$ ,  $\beta=0.473$ ) is positive and significant. Is. Thus, in the test of the third hypothesis of the research, it was concluded that self-care in irritable bowel syndrome patients positively and significantly predicts the expected outcome.

Fourth hypothesis: Health anxiety predicts self-control in people with irritable bowel syndrome. Table 6 shows that the coefficient of the direct path between health anxiety and self-control ( $p=0.038$ ,  $\beta=0.226$ ) is positive and significant. . Thus, in testing the fourth hypothesis of the research, it was concluded that health anxiety positively and significantly predicts self-control in irritable bowel syndrome patients.

The fifth hypothesis: Health anxiety in irritable bowel syndrome patients predicts outcome expectation. Table 6 shows that the direct path coefficient between health anxiety and outcome

expectation ( $p=0.001$ ,  $\beta=0.568$ ) It is negative and significant. Thus, in the test of the fifth hypothesis of the research, it was concluded that health anxiety in irritable bowel syndrome patients negatively and significantly predicts the expected outcome.

Sixth hypothesis: Self-care mediates the relationship between health anxiety and self-control in patients with irritable bowel syndrome. Table 6 shows that the indirect path coefficient between health anxiety and self-control ( $p=0.001$ ,  $\beta=0.134$ ) is positive and significant. Thus, in the test of the sixth hypothesis of the research, it was concluded that self-care positively and meaningfully mediates the relationship between health anxiety and self-control in irritable bowel syndrome sufferers.

The seventh hypothesis: self-care mediates the relationship between health anxiety and outcome expectation in patients with irritable bowel syndrome. Table 6 shows that the indirect path coefficient between health anxiety and outcome expectation ( $p=0.001$ ,  $0.240 = \beta$ ) is positive and significant. Thus, in testing the seventh hypothesis of the research, it was concluded that self-care positively and meaningfully mediates the relationship between health anxiety and outcome expectation in irritable bowel syndrome sufferers of self-control.

### **Discussion and conclusion:**

The purpose of this study was to investigate the mediator role of self-care in predicting self-control and outcome expectations based on health anxiety in patients with irritable bowel syndrome. The structural model of the research, in which it is assumed that health anxiety predicts both directly and through the mediation of self-care, self-control and expectation of outcome in patients with irritable bowel syndrome, fits the collected data. The results showed that all fit indices support the acceptable fit of the structural model with the collected data. Thus, the first hypothesis was confirmed and it was concluded that the structural model of the research fits the collected data.

Self-care predicts self-control in patients with irritable bowel syndrome. The results showed that the path coefficient between self-care variable and self-control is positive and significant. Thus, in the test of the second hypothesis of the research, it was concluded that self-care in irritable bowel syndrome patients predicts self-control in a positive and meaningful way, and the reason for this, according to the researcher, is that self-care is a practice in which every person of knowledge, uses his skill and power as a resource to take care of his health independently. "Independently" means making decisions about yourself and relying on yourself. Of course, this decision can also include consulting and obtaining expert or non-expert help from others. Although self-care is an activity that people do to ensure, maintain and improve their health, sometimes this care extends to children, family, friends, etc. Therefore, five features are hidden in the definition of self-care: it is a voluntary behavior, it is a learned activity, it is the right and responsibility of everyone to maintain their health, family and relatives, it is part of the care of babies, children, and teenagers and the elderly and adults who are capable of self-care are not, they will need to receive health care from social or health service providers. Self-care is an active and practical process that is guided by the patient and is necessary for the prevention of short-term and long-term

complications. The results of this hypothesis from the present research are in line with Wheaton, Messner, and Marks model (19).

Self-care predicts expected outcomes in patients with irritable bowel syndrome. The results showed that the path coefficient between self-care and outcome expectation ( $p=0.001$ ,  $\beta=0.473$ ) is positive and significant. Thus, in the test of the third hypothesis of the research, it was concluded that self-care in patients with irritable bowel syndrome predicts the outcome in a positive and meaningful way, and the reason for this, according to the researcher, is that self-care is a voluntary behavior that is based on the will and People's will takes place, and during that, by acquiring enough knowledge and skills, a person will be able to take care of his health by relying on himself. The will to take care of oneself, which is the driving force of self-care behaviors, requires the emergence of the necessary motivations in people. Based on this, the will to self-care as the driving engine of self-care behaviors requires the emergence of the necessary motivations in people. Because motivations are the reasons for behavior and cause the beginning and continuation of activities; Motives determine the general direction of a person's behavior and sometimes they are defined as needs, desires, or internal stimuli of a person. Humans differ from each other not only in terms of their ability to do work, but also in terms of their desire or will to do work or motivation, and people's motivation depends on their motivating force. The ultimate goal of self-care behaviors is to empower patients, especially chronic patients. In self-care, an attempt is made to shift some decisions to the patient. By actively participating in the management and treatment of the disease, patients are empowered to gain more control over their daily lives, through engaging them in health behaviors, monitoring symptoms, and using activities that reduce the debilitating symptoms caused by chronic disease reduces, takes place. The results of this hypothesis from the present research are in line with the constant model of Far, Meschi, Hosseinzadeh Taqvai (20) and Vaini (21).

Health anxiety predicts self-control in patients with irritable bowel syndrome. The results showed that the direct path coefficient between health anxiety and self-control ( $p=0.038$ ,  $\beta=0.226$ ) is positive and significant. Thus, in testing the fourth hypothesis of the research, it was concluded that health anxiety positively and significantly predicts self-control in irritable bowel syndrome patients. The reason, according to the researcher, is that psychological stress and anxiety can increase the release of pre-inflammatory cytokines and this, in turn, may change intestinal permeability. Anxiety is actually experienced by all humans. Anxiety is a widespread, very unpleasant and often vague feeling of withdrawal that is often accompanied by symptoms of the autonomic system such as chest tightness, palpitations, definition, headache, brief stomach discomfort and restlessness that is characterized by the inability to sit or stand. Anxiety is a reaction to an unknown, internal, vague, unpleasant and pervasive threat that most of the time with Symptoms include headache, sweating, heart palpitations and chest pain. So far, various definitions for anxiety have been stated, some of them are mentioned below. A) Anxiety is generally an annoying expectation. It means something that may happen in a wide and often nameless tension. This state, which appears in the form of a current feeling and experience, like any emotional disturbance, on both psychological and physical levels, may also be related to an

"anxious" objective threat (direct or indirect threat of death, personal misfortune or punishment). b) Anxiety is a person's reaction to a traumatic situation, i.e. a situation where the effect of external or internal stimuli is high and the person is unable to control them. c) Psychological discomfort, at the same time, the unpleasantness that is caused by a vague fear and feeling of insecurity and impending darkness in a calm person. It includes For example, in the presence of an unconditioned stimulus (usually a shock or jolt), the animal's behaviors are considered as definite signs of anxiety. e) Anxiety is an emotional state with a direct awareness of the meaninglessness, imperfection and chaos of the world in which we live. The results of this hypothesis from the present research are in line with the model of Rabiei, Ghorbani, Panaghi (10), Parhizgar, Moradi Menesh, Saraji Khormi, Ehtshamzadeh (22).

Health anxiety predicts outcomes in patients with irritable bowel syndrome. The results showed that the coefficient of the direct path between health anxiety and outcome expectation ( $p=0.001$ ,  $\beta=0.568$ ) is negative and significant. Thus, in the test of the fifth hypothesis of the research, it was concluded that health anxiety in irritable bowel syndrome patients negatively and significantly predicts the expectation of the outcome. refers to anxiety and symptoms related to anxiety and is derived from the belief that these symptoms lead to potentially harmful physical, psychological, and social consequences and that people with high anxiety sensitivity often experience symptoms. Anxieties react negatively, which causes people with irritable bowel syndrome to significantly change their lives and those around them. Adapting to these changes seems difficult. Because it affects different aspects of a person's life and creates worries and fears. For many people with this disease, thinking about the disease and the treatment path and the not-so-known future of the disease can make them panic. The results of this hypothesis from the present research are in line with the model of Bagheri Shikhangfesh, Shabahang, Tajbakhsh, Hamida Moghadam, Sharifipour Chekami and Mousavi (23).

Self-care mediates the relationship between health anxiety and self-control in patients with irritable bowel syndrome. The results showed that the coefficient of the indirect path between health anxiety and self-control ( $p=0.001$ ,  $\beta=0.134$ ) is positive and significant. Thus, in the test of the sixth hypothesis of the research, it was concluded that self-care positively and meaningfully mediates the relationship between health anxiety and self-control in irritable bowel syndrome sufferers. The reason for this, according to the researcher, is that self-care leads to an effort that through active participation in the management and treatment of the disease, patients are empowered to gain more control over their daily lives, which is through attracting their participation in health behaviors. , monitoring symptoms and applying activities that reduce the debilitating symptoms caused by chronic disease, which can be psychological discomfort at the same time, unpleasantness caused by vague fear and feeling of insecurity and gloom in irritable bowel syndrome sufferers. It reduces a person's emotions, which results in an increase in self-control, when a person recognizes their feelings and understands their implicit meanings, and expresses their emotional states to others more effectively. The results of this hypothesis from the present research with the model. Qaidi, Ghasemi and Gholami (24) are consistent.

Self-care mediates the relationship between health anxiety and outcome expectancy in patients with irritable bowel syndrome. The results showed that the coefficient of indirect path between health anxiety and outcome expectation ( $p=0.001$ ,  $\beta=0.240$ ) is positive and significant. Thus, in testing the seventh hypothesis of the research, it was concluded that self-care positively and meaningfully mediates the relationship between health anxiety and outcome expectation in irritable bowel syndrome sufferers of self-restraint, and the reason for this is that self-care increases every time and maintain the level of health and self-actualization of the individual and emphasize on health-enhancing behaviors on positive life patterns that increase the level of health and quality of life, which mediates the relationship between health anxiety and outcome expectation slow In this way, anxiety causes people with irritable bowel syndrome to significantly react to their disease and create worry and fear for them. For many people with this disease, thinking about the disease and the treatment path and the unknown future of the disease can make them panic, and the person's expectation before entering the treatment process is higher than its consequences, and stress will experience more psychological. The results of this hypothesis from the present research are in line with the model of Khaltabari, Hemti Thabit, Tabibzadeh, Hemti Thabit (25).

**Limitations:**

One of the limitations of this research was that the current research was limited to a clinical sample of patients and generalization of the results to other populations with cultural differences should be done with caution. Among other limitations was the large number of questions in the questionnaire, which may have caused impatience and carelessness in answering the questionnaires.

**Ethical considerations:**

The subjects were reminded that the information will remain confidential and their names will not be mentioned anywhere, and also, they were asked to honestly complete the questionnaires because these questionnaires do not have any evaluation aspect, only in order to access the research results of they have been used. In addition, the subjects were given permission to refuse to participate in the research if they wished.

**Conflict of interest:**

The authors hereby declare that this work is the result of an independent research and does not have any conflict of interest with other organizations and persons.

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