Predicting Intensity of Symptoms in Patients with Irritable Bowel Syndrome Based on Their Mental Health, Quality of Life, and the Use of Leisure Time

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ABSTRACT

Background:
This study aimed to predict the intensity of symptoms in patients with irritable bowel syndrome (IBS) based on their mental health, quality of life, and use of leisure time.

Materials and Methods:
To do this, 300 patients were chosen from those who referred to two gastrointestinal clinics in north and east of Tehran by using target-based sampling method. Of them 92 patients filled out the Rome–III diagnostic questionnaire, Ryff Scale of Psychological Well-Being (RSPWB), SF-12 questionnaire, and leisure time questionnaire. Data were analyzed by using Pearson correlation coefficient and multiple stepwise logistic regression analysis.

Results:
The results showed that mental health, quality of life, and use of leisure time can predict the intensity of symptoms in these patients ($p \leq 0.01$). It was also observed that among the demographic variables, age (older patients), sex (female patients), marital status (married patients), level of education (low literacy skills), and the number of referrals to physicians can predict the intensity of symptoms ($p \leq 0.01$).

Conclusion:
It can be concluded that mental health turned out to be the strongest predictive variable. Also, quality of life and use of leisure time can predict the intensity of symptoms in patients. Hence, improving mental health and providing a better environment for living and recreation may have a positive outcome for patients with IBS.

Keywords: Irritable bowel syndrome, IBS, Mental health, Quality of life, Leisure time procedure

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INTRODUCTION

Irritable bowel syndrome (IBS) is one of the most prevalent disorders that affects large intestine (colon) and usually causes abdominal pain, abdominal cramp, increase in intestinal gas, bloating, diarrhea, and constipation. This disease is a chronic indisposition that needs long term management(1). In spite of disturbing signs of IBS-unlike Crohn's disease and ulcerative colitis that are forms of inflammatory bowel disease-IBS does not cause changes in bowel tissue and does not increase

the risk of colorectal cancer (2). IBS outbreak in the world is reported to be over 11% (3). Moreover recent statistics show that over 21.5% of Iranian population is affected by this illness (4). Although IBS is not a virulent disease, due to its consequent problems, it is likely to affect the patients' mental health.

Mental health is considered as one of the most important and significant psychological parameters when encountering IBS. Research shows that, in comparison with normal people, the general health condition in both young and old patients with IBS is at a lower level, in a way that experts in gastrointestinal field emphasize the importance of psychological treatments to control the symptoms of IBS (5). Also, symptoms of IBS have been reported to be substantially high in patients with fear, generalized anxiety disorder, and depression (6). Some studies demonstrate that combined use of psychological treatments and medication (particularly taking anti-depressants) is effective in enhancing the quality of life in patients with IBS (7,8). This is while other studies emphasize the effect of cognitional-behavioral treatment (CBT) and relaxation in reducing the symptoms of this disease (9,10).

Another considerable variable that has attracted researchers' attention is Health-Related Quality of Life (HRQL) or "quality of life" for short. The patients, depending on the intensity of the symptoms, experience some degrees of disorder in their quality of life, in a way that this illness is the main cause of avoiding daily activities in a considerable group of patients, such as absence in gatherings, avoiding certain foods, occupation, social activities, traveling, sport, and activities related to leisure time, which all are due to the fear of symptoms appearance. Also, the level of quality of life in patients with IBS has been reported to be lower in comparison with normal population and healthy people (11,12). Many studies have proven the effectiveness of antidepressant medications in reducing the symptoms and enhancing the quality of life in patients with IBS (13,14). Therefore, the intensity of symptoms in patients with IBS is proportional to the level of their quality of life. And patients with acute signs possess lower quality of life, in comparison with patients with milder signs.

Another important parameter that is expected to be effective in reducing the intensity of the symptoms in patients with IBS is leisure time. Leisure or free time is the experience that an individual chooses and voluntarily takes part when he or she is free from the obligations of workplace and daily life, according to their personal interests, needs, and fascination (15). Psychologists and sociologists all unanimously believe that spending free time in a purposeful, organized manner is a necessity of today's life, because amusement and entertainment have an important role in nurturing the mental and behavioral power of individuals and can have considerable impact on enhancing and improving the quality of personal and social life of individuals in the society (16,17).

Evaluation of free time for the purpose of studying its effect on the intensity of the symptoms of IBS depends on the manner of spending it. As it is expected, as people spend their free time more planned and organized along with fun and leisure and constructive activities, their psychological well-being will be uplifted and improved. Therefore, it is expected that adopting an appropriate style of spending free time in patients with IBS, reduces the intensity of their symptoms and consequently facilitates enduring the illness. This research has been carried out with the aim of studying the relation between psycho-behavioral variables and symptoms of IBS. Since, the effect of using leisure time in such patients has not been studied yet this study has aimed at predicting IBS according to psychological health, life quality, and spending leisure time.

MATERIALS AND METHODS

This was a descriptive/correlational study, aimed at describing the correlation between the independent variables and the intensity of symptoms. The method used was descriptive in terms of collecting the data that was conducted based on the framework of a predictive correlation scheme. The participants of the current study included all the patients with IBS who referred to two gastrointestinal clinics in Tehran. After being diagnosed by a gastroenterologist based on interview, clinical examination, and Rome-III diagnostic criteria, 92 patients were chosen by target-based sampling method.

Instruments

A. Rome–III Diagnostic Criteria

The latest version of this set that is known as Rome–III diagnostic criteria was published in 2006 in the form of a report in the Journal of Gastroenterology. Currently it is used by gastrointestinal specialists as a standard tool for diagnosing and measuring the intensity of IBS [18]. Generally, the signs that lead to diagnosis of IBS are as follows: repetitive pain or abdominal discomfort for at least 3 days in a month during the past 3 months, along with at least two of the following points:

1) Change in defecation

2) Change in the frequency of defecation

3) Change in the form and appearance of the feces

To evaluate the severity of illness, grading was done based on the scores of this questionnaire and directly under the gastroenterologist's supervision. Then the patients' diseases were classified as follows: 0-9: mild; 10-21: moderate; and 22-28: severe.

B. Ryff Scale of Psychological Well-Being (RSPWB)

This short questionnaire with 18 items aims at assessing and studying psychological well-being from different aspects and dimensions (self-acceptance, dominating and managing the environment, positive relation with others, having goals in life, personal growth and independence). Scoring spectrum for this questionnaire is based on Likert spectrum with six alternatives. The results of single-group confirmative factor analysis show that the six-factor model of this scale has a good fitting all over the sample and for both female and male individuals. Using Cronbach's alpha, the internal consistency of this scale in six factors of self-acceptance, dominating and managing the environment, positive relation with others, having goals in life, personal growth, and independence are 0.51, 0.76, 0.75, 0.52, 0.73, and 0.72, respectively, while for the overall scale it has been reported to be 0.71 [19].

C. Health-Related Quality of Life Questionnaire (SF-12)

This short questionnaire with 12 items is used extensively in a variety of studies. It has eight sub-scales that evaluate the quality of life in terms of one's general understanding of his health, physical performance, physical health and well-being, excitement problems, physical pain, social function, vital energy and joy, and psychological well-being. Due to the small number of items, often, the total score of the individuals is taken into account. The validity of SF-12 was studied by Ware and colleagues [20], through the experimental validity method and by Kontodimppouls et al [21], and validity was reported to be relatively high. Montazeri and others [22], also, studied the validity and reliability of this questionnaire in Iran. The reliability of the 12 items of physical and psychological components was reported to be 0.73, and 0.72, respectively.

D. Leisure Time Questionnaire

This 20-item questionnaire aims at assessing the view of individuals towards their free time. The subscales of this questionnaire include: decision making skill, leisure time consciousness skill, social relations skill, and self-awareness skill. This tool has been devised according to Likert scale (completely disagree: 1, disagree: 2, no opinion: 3, agree: 4, completely agree: 5). Its validity and reliability are relatively high in a way that its Cronbach's alpha has been reported to be 0.93 [16].

Procedure

Among 300 patients referring to gastrointestinal clinics, 92 qualified patients agreed to contribute in this study. There were no literacy criteria for the participants. The patients filled out the quantitative Rome-III questionnaire in order to be assessed in terms of disease diagnosis and symptom intensity. The questionnaires were self-completed by the patients without interview. Then, after inclusion in the study, they were assessed based on standard questionnaires on mental health, quality of life, and leisure time. They were asked to turn in the questionnaires upon completion for further assessment.

The criteria for entering the study were: a) Diagnosis of IBS according to Rome–III diagnostic criteria; b) Diagnosis by the gastroenterologist; and c) Not receiving any psychological treatments or any type of psychiatric medications during the previous two months.

Table 1: **Matrix of correlation between subscales of mental health, quality of life, use of leisure time, and the intensity of IBS**

Variables	IBS
Independence	0.620**
dominating and managing their environment	0.610**
Personal growth and development	0.617**
Positive relation and attitude toward others	0.630**
Being purposeful in life	0.606**
Self-acceptance	0.588**
Total score for mental health	**0.638****
General understanding about self well-being	0.635**
Physical performance	0.619**
Physical health	0.564**
Excitement problems	0.576**
Physical pain	0.623**
Social function	0.598**
Vital energy and joy	0.593**
Mental health	0.604**
Total score for quality of life	**0.652****
Decision making skill	0.566**
Skill of being aware of leisure time	0.572**
Social relations skill	0.500**
Self-awareness skill	0.676**
Total score for use of leisure time	**0.600****

** Significant correlation at the level of 0.01

IBS: Irritable bowel syndrome

Table 2: **Results of regression analysis for IBS based on mental health, quality of life, and use of leisure**

Predictor	β	t	Level of significance	R^2	F	Level of significance
Constant	-	2.64	0.001	0.541	143.104	0.001
1. Mental Health	0.369	1.848	0.001			
2. Quality of life	0.331	3.772	0.041			
3. Use of leisure time	0.163	9.147	0.001			

IBS: Irritable bowel syndrome

RESULT

The obtained information was analyzed using Pearson's correlation coefficient and multiple stepwise logistic regression analysis. This was implemented by SPSS software.

The participants consisted of 92 individuals, of whom 52 (56%) were female.

Research hypothesis: mental health, quality of life, how the leisure time is used, and demographic indicators can predict the intensity of symptoms in patients with IBS.

Pearson's correlation coefficient method and regression analysis were used to verify this hypothesis and the results are shown in tables 1 and 2.

Table 1 shows that there is a significant relationship between mental health and independence, dominating and managing the environment, positive relation and attitude towards others, being purposeful in life, and self-acceptance ($p < 0.01$). Also, there is a significant relationship between quality of life and general understanding about self well-being, physical performance, physical health, excitement problems, physical pain, social function, vital energy and joy, and mental health ($p < 0.01$). There is also

Table 3: Results of regression analysis for IBS based on the most powerful demographic indicators and characteristics

Predictor	β	t	Level of significance	R²	F	Level of significance
Constant	-	3.63	0.001	0.653	132.50	0.001
1. Age (older)	0.223	3.042	0.049			
2. Sex (female)	0.563	2.848	0.001			
3. Marital Status (married)	0.169	6.147	0.001			
4. Literacy skills (low)	0.008	4.645	0.001			
5. Referring or not referring to gastroenterologist (low)	0.37	3.625	0.001			

IBS: Irritable bowel syndrome

a significant relationship between use of leisure time and decision-making skill, skill of being aware of leisure time, social relations skill, and self-awareness skill ($p < 0.01$).

Results in table 1 demonstrate the existence of a relationship between subscales of mental health and IBS, between subscales of quality of life and the intensity of IBS symptoms, and between use of leisure time and the intensity of IBS symptoms.

Multiple stepwise logistic regression analysis was conducted in order to predict the intensity of symptoms in patients with IBS using mental health, quality of life, use of leisure time, and demographic parameters. The results of this analysis are presented in table 2.

Table 2 shows that the test value F for predicting intensity of symptoms based on mental health, quality of life, and use of leisure time is equal to 143.104 which is significant at the $p < 0.01$ level. On the other hand, R^2 shows that 54.1% of the variance is expressed in terms of mental health, quality of life, and use of leisure time. Mental health ($\beta = 0.369$) was the strongest predictive parameter for the intensity of symptoms, followed by $\beta = 0.331$ and $\beta = 0.163$ as predictive parameters, respectively.

In order to determine whether demographic variables play roles in the intensity of IBS, regression analysis was used. The results are shown in table 3.

Table 3 shows that the test value F for predicting the intensity of symptoms based on the demographic parameters is equal to 132.50, which is significant at the $p < 0.01$ level. Also, 65.3% of the variance is expressed in terms of demographic parameters. Sex ($\beta = 0.563$) was the strongest predictive parameter followed by age ($\beta = 0.223$), marital status ($\beta = 0.169$), frequency of visiting by physicians ($\beta = 0.37$), and literacy skills ($\beta = 0.008$), respectively.

DISCUSSION

This study was conducted in order to predict the intensity of symptoms in patients with IBS based on mental health, quality of life, and use of leisure time. The results show that mental health, quality of life, and use of leisure time, together can predict 53.7% of IBS variance.

The findings show that when the three variables entered the regression equation, mental health turned out to be the strongest predictive variable. The findings in this part of research are in the same direction as those in other studies, which have shown that patients with IBS suffer from considerable level of psychological distress. It should be noted that the incidence of distress in life is significantly higher for patients with IBS in comparison with people who experience such obstacles in much lower levels. Studies with similar findings to the current research include: Solmaz [23], Latimer [24], Pinto [25], Garakani [26], Lydiard [27], and Pavloski [28] and their colleagues. In general, the results of this study seem to imply that, due to low level of the above-mentioned three predictors, patients with IBS suffer from degrees of mental health disorders. Also, low mental health in such individuals leads to lack of daily activities and even absence in their daily job.

Another finding of this study was that quality of life can predict the intensity of symptoms in patients with IBS. This result is in the same direction as the findings of Kanazawa [29], Park [30], and Gholamrezaei [31].

The findings demonstrate that use of leisure time can predict the intensity of symptoms in patients with IBS. Specifically, the obtained results show that IBS is more severe in patients with no particular plan for their free time, or patients who do not find any leisure time in their lives. Therefore, such patients

can manage the intensity of their symptoms through deploying a regular schedule for their leisure time. The results of this hypothesis is in harmony with the results of studies done by Blumentahal (32), Meyer (33), Martinsen (34), and Guszkowska (35). Reports show that frequent aerobic activities result in improvements in patients' temperament, which in turn lead to improvements in their mental health (36). Therefore, by considering psychological and mental issues of people with IBS, it can be said that the optimum use of leisure time as a suitable, easy, and cost-effective strategy, and improving physical and mental health, seem to be necessary more than ever. So, the necessity of planning and adopting certain schedules to use the leisure time are once again emphasized.

Results show that age, sex, marital status, education level, and visiting physicians are also predictive variables for the intensity of symptoms in patients with IBS. In other words, based on the demographic indicators, it may be said that female patients are physically and mentally more prone to this functional disorder. Thus, one may state that the root of physical illness can be traced back to the tensions and psychological damages. Age was the next powerful predictor, so it may be said that individuals get exposed to more pressure and tension as they get older. The needs and challenges of people increase by elapse of time and such psychological damages increase the intensity of IBS. Erosion of internal body organs and structure as well as combination of different physical and psychological disorders in long term add up to the causes. Marital status (being married) is also considered as another demographic indicator, which predicts the intensity of IBS. It seems that some challenges of marital life are not solvable, so that the individuals might feel helpless in dealing with such problems, which in turn intensify the symptoms of IBS in long term. Not referring to physicians at all demonstrates the fact that lack of prevention from certain types of physical and psychological disorders at certain times can lead to some disorders and defects in the body system, including disorders in the function of intestines. Literacy skills as the last and least powerful predictor demonstrate that higher literacy skills can contribute to better management of physical conditions. Therefore, individuals with lower levels of education, or in other words those with not enough awareness, do not tend to take actions for their health care. Hence, such individuals with IBS are expected to suffer from more intense symptoms.

The inference of the findings in every study can only be done in the framework of its inevitable limitations. As a limitation, this study was conducted in Tehran and further careful studies need to be done in case of necessity for generalization to other patients in other locations. Also, this study was carried out only at a time, which makes difficult considering the finding as the cause. Based on these limitations, we suggest that further studies be conducted in other geographical parts of the country, possibly on greater population. We propose that future studies attempt to predict other diseases based on the variables used here, and make a comparison with those of the present study.

CONFLICT OF INTEREST

The authors declare no conflict of interests related to this work.

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