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*For further information about this article or if you need reprints, please contact:*

Maryam Izadi-Mazidi  
Department of Clinical Psychology,  
Shahed University, Tehran, Iran

Tel : 09171346040  
Fax : 02144159668

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## Anxiety and Quality of Life in patients with Irritable Bowel Syndrome

<sup>1</sup>Shahnaz Mohammadi, <sup>2</sup>Maryam Izadi-Mazidi and <sup>1</sup>Mahsa Akbarian-Firoozabadi

Irritable Bowel Syndrome (IBS) is a prevalent gastroenterological problem that has no identified pathology. There is evidence to suggest that patients with IBS suffer from mental disorders and impairment in quality of life. The aim of this study was to compare the anxiety and quality of life in Iranian individuals with and without irritable bowel syndrome. A total of 60 patients with Irritable Bowel Syndrome (IBS) and 60 healthy individuals participated in the study. The data was gathered using Cattle anxiety scale, Short Form-36 Health Survey (SF-36), Rome III diagnostic questionnaire and demographic forms and were analyzed through multivariate analyses of variance (MANOVA), Chi-square test and Fisher's exact test. The results revealed that patients with IBS have more anxiety ( $F = 287.48, p < 0.001$ ) and less quality of life ( $F = 151.7, p = 0.002$ ) compared to healthy individuals. IBS was significantly more prevalent in females and individuals who were living in urban areas ( $p < 0.05$ ). But, there was no significant difference in prevalence of IBS among individuals with different levels of education ( $p = 0.53$ ). The IBS is associated with higher rates of anxiety and lower quality of life. This highlights the importance of management of these patients and assessing the impact of psychological interventions.

**Key words:** Irritable bowel syndrome, Cattle anxiety scale, Rome III criteria, alexithymia, gastrointestinal specific anxiety

## INTRODUCTION

Irritable Bowel Syndrome (IBS) is a prevalent gastroenterological problem that causes suffering from abdominal pain, bloating and altered bowel habits (Canavan *et al.*, 2014; Dainty *et al.*, 2014; Roberts *et al.*, 2013).

This chronic and relapsing disorder (Lee *et al.*, 2009) occurs in all age groups (Canavan *et al.*, 2014). Existing estimates indicate that global prevalence of IBS is about 4-30% (Ghoshal and Srivastava, 2014) and patients tend to be young and middle-aged women (Canavan *et al.*, 2014; Lorenzo-Zuniga *et al.*, 2014). Irritable bowel syndrome interfere with the affected individuals' health related quality of life (Lorenzo-Zuniga *et al.*, 2014; DiBonaventura *et al.*, 2011; Li *et al.*, 2003; Creed *et al.*, 2001; El-Serag *et al.*, 2002), in spite of its benign long term prognosis (Lorenzo-Zuniga *et al.*, 2014). And there is evidence to suggest that the costs of somatic diagnostic procedures and medical treatment attempts on IBS are enormous (Lorenzo-Zuniga *et al.*, 2014; Levy *et al.*, 2001; Nyrop *et al.*, 2007). It has also indirect costs related to decreased productivity and efficacy at work (Lorenzo-Zuniga *et al.*, 2014).

The exact cause of IBS is poorly understood (Mykletun *et al.*, 2010; Folks, 2004). And beside different hypothesis about physical factors such as colonic motility disturbances, gastrointestinal hypersensitivity, gastrointestinal inflammation (Lorenzo-Zuniga *et al.*, 2014; Muscatello *et al.*, 2014; Hauser *et al.*, 2014), abnormalities in the gut flora (Khanna and Tosh, 2014), small intestinal bacterial overgrowth (Ohman and Simren, 2010) and disruption of the brain-gut axis (Lin, 2004), psychological conditions have been reported to be an important contributor to production or exacerbation of IBS (Lee *et al.*, 2009; Mykletun *et al.*, 2010; Walker *et al.*, 1995; Osterberg *et al.*, 2000; Gulewitsch *et al.*, 2013; Lackner *et al.*, 2013). More than 90% of patients with IBS experience at least one mental disorder during their lifetime (Liss *et al.*, 1973; Fossey and Lydiard, 1990; Irwin *et al.*, 1996; Lydiard, 2001).

Anxiety disorders (Lee *et al.*, 2009; Yi *et al.*, 2014; Yacob *et al.*, 2013), depression (Lee *et al.*, 2009; Yi *et al.*, 2014; Yacob *et al.*, 2013; Walker *et al.*, 1995), panic disorder (Paras *et al.*, 2009), childhood sexual abuse (Yacob *et al.*, 2013; Van Tilburg *et al.*, 2010; Mahvi-Shirazi *et al.*, 2013) PTSD (Hauser *et al.*, 2014), phobia (Van Tilburg *et al.*, 2010) and somatoform disorders (Surdea-Blaga *et al.*, 2012) are psychological conditions that has been reported to be associated with IBS. And mood disorders, anxiety disorders and somatoform disorders are most prevalent (Surdea-Blaga *et al.*, 2012).

Gastrointestinal Specific Anxiety (GSA) and alexithymia also are two psychological constructs that may contribute to severity of irritable bowel syndrome (Porcelli *et al.*, 2014). In the study conducted by Niesten *et al.* (2014), a childhood history of non-sexual abuse and a family history of IBS were predictors of IBS diagnosis in women with bipolar disorder (Niesten *et al.*, 2014). Some results however challenge the plausibility of the association between IBS and psychological problems (Talley *et al.*, 2001).

Because of these controversial findings and little knowledge about psychological conditions and health related quality of life of patients with IBS in Iran, the present study aimed to compare anxiety and quality of life in patients with IBS and healthy individuals in Iranian population.

Since poor treatment outcome in patients with IBS may partly due to undetected comorbid psychological disorders (Lee *et al.*, 2009), identifying mental disorders help clients in management of their patients.

## MATERIALS AND METHODS

**Subjects:** Research was conducted over a period of 12 months from 2013-2014. A total of 60 patients with Irritable Bowel Syndrome (IBS) and 60 healthy individuals participated in the study. The patients selected from referral centers in Tehran, Iran. The diagnosis of Irritable Bowel Syndrome (IBS) was performed by gastroenterologist. Healthy individuals were selected from general population and had no history of gastroenterological problem.

After describing the procedures and purposes of the study, written informed consents were obtained. Each subject was asked to complete the Persian version of Cattle anxiety scale, World Health Organization Quality of Life (WHOQOL) and Irritable Bowel Syndrome (IBS) symptom checklist as well as a questionnaire to obtain demographic data about gender, age, level of education and marital status.

### Instruments

**Cattell's anxiety scale:** The instrument consists of 40 items. The items are divided into 2 sub-scales including state anxiety and trait anxiety. The range of the test-retest reliability coefficient is reported to be from 0.65-0.75, with a 2 month interval between tests. Construct and concurrent validity of the scale has also been performed and supports its validity (Spielberger, 1989; Spielberger *et al.*, 1983). Cattle anxiety scale has been shown to be reliable and valid in an Iranian population (Salarifar and Etemad, 2011).

**World Health Organization Quality of Life (WHOQOL):** This questionnaire consists of 36 items. It measures eight health subscales including physical functioning, role

limitations because of physical problems, bodily pain, general health perception, vitality, social functioning, role limitations because of emotional problems and mental health.

Physical functioning, role limitations because of physical problems, bodily pain, general health perception grouped in to physical component and vitality, social functioning, role limitations because of emotional problems and mental health are subscales of mental component. Each subscale graded from 0-100. Higher scores are considered better status (Stull *et al.*, 2014).

This scale has been used in many researches in Iran and the questionnaire validity and reliability has been confirmed (Montazeri *et al.*, 2005).

**Rome III diagnostic questionnaire:** It is a self-report questionnaire that has been developed for the diagnosis of functional gastrointestinal disorders (Wang *et al.*, 2012). According to Rome III diagnostic criteria, IBS is characterized by abdominal pain or discomfort in at least 3 of the previous 6 months, with 2 or more of the following items:

- Pain or discomfort improved after defecation
- Pain or discomfort associated with a change in frequency of stool
- Pain or discomfort associated with a change in the form of stool (Dong *et al.*, 2013)

**Statistical tests:** Data was analyzed using multivariate analyses of variance (MANOVA), Chi-square test and Fisher exact test. The probability level of 0.05 was accepted as statistically significant. Statistical analyses were carried out using SPSS version 16.

## RESULTS

Demographic characteristics (sex, residence and level of education) of both patients and healthy individuals are detailed in Table 1.

The anxiety and quality of life of patients and healthy individuals were compared using multiple univariate

analyses of variance (ANOVAs). There were significant differences between patients and healthy individuals in anxiety ( $F = 287.48, p < 0.001$ ) and quality of life ( $F = 151.7, p = 0.002$ ). It means patients with IBS suffering from higher level of anxiety and have lower level of quality of life compared to healthy individuals. A comparison of two variables is shown in Table 2.

Distributions of IBS according to demographic variables are listed in Table 3. The IBS was found in 65% (39 of 60) of female and 35% (21 of 60) of male ( $\chi^2 = 5.57, p = 0.006$ ). Twenty four percent of patients had grade school level of education, 35% had 12 years/high school education and 21.6% of patients had university degree ( $\chi^2 = 19, p = 0.53$ ). Forty five percent of patients were living in urban areas and 25% of them were from rural areas ( $\chi^2 = 7.68, p = 0.001$ ). Hence, there are significant differences between patients and healthy individuals with different gender and education subgroups in prevalence of IBS.

Table 1: Demographic characteristics of the patient and control groups

Demographic variables	Frequency			
	Patients with IBS		Healthy individuals	
	No.	%	No.	%
<b>Gender</b>				
Female	39	65	33	55
Male	21	35	27	45
<b>Education</b>				
Grade school	24	40	17	28.33
12 years/high school	21	35	27	45
University degree	13	21.6	16	26.66
<b>Residence</b>				
Urban	45	75	52	86.66
Rural	15	25	8	13.33

IBS: Irritable bowel syndrome

Table 2: Comparison using multivariate analysis of variance (MANOVA) of anxiety and quality of life of patients and healthy individuals

Variables	Patients		Healthy individuals		$F_{1,118}$	p-value
	Mean	SD	Mean	SD		
Anxiety	50.25	±7.60	26.76	±7.82	287.48	<0.001
Quality of life	57.46	±8.12	37.68	±7.95	151.7	0.002

Table 3: Prevalence of IBS based on demographic features

Demographic variables	Frequency				$\chi^2$	df	p-value
	Patients with IBS		Healthy individuals				
	No.	%	No.	%			
<b>Gender</b>							
Male	39	65	33	55.0	5.57	1	0.006
Female	21	35	27	45.0			
<b>Education</b>							
Grade school	24	40	17	28.33	19.0	2	0.53
12 years/high school	21	35	27	45.0			
University degree	13	21.6	16	26.66			
<b>Residence</b>							
Urban	45	75	52	86.66	7.68	1	0.001
Rural	15	25	8	13.33			

IBS: Irritable bowel syndrome, df: Degree of freedom

## DISCUSSION

The present study aimed to compare anxiety and quality of life in patients with Irritable Bowel Syndrome (IBS) and healthy individuals. Our findings showed that patients with IBS suffered from higher level of anxiety and poorer quality of life compared to healthy individuals.

The findings replicate the results of studies conducted by Lee *et al.* (2009), Mykletun *et al.* (2010), Porcelli *et al.* (2014) and Yi *et al.* (2014) that showed IBS was significantly related to anxiety. Our finding also is congruent with result of Lackner *et al.* (2013), who reported anxiety sensitivity and perceived stress as some of predictors of fatigue in patients with IBS (Lackner *et al.*, 2013).

These findings indicate that psychological factors, including anxiety, may collaborate to physical factors to trigger or intensify functional gastrointestinal disorders. Enteric nervous system is very sensitive to the emotional states so that negative emotions such as stress, change in bowel movement activities and can cause bowel symptoms such as IBS (Hauser *et al.*, 2014). Patients with IBS have more often reported themselves as experiencing stressful and major life events before the onset of illness (Surdea-Blaga *et al.*, 2012).

The relationship between psychosocial factors and symptom onset might also be explained, in part, by specific biological mechanisms. The main stress-response axis of the body i.e., hypothalamic-pituitary-adrenal axis has been reported to be related to chronic widespread pain. This axis may also be involved in functional gastrointestinal disorders including IBS (Nicholl *et al.*, 2008).

It is also suggested that excess of corticotropin releasing hormone may be related to both anxiety and IBS-like symptoms (Lee *et al.*, 2009). Other comments stated that psychological problems in patients with IBS may be reaction to stress of the chronic illness (Whitehead *et al.*, 1988). But lower rate of mental disorders in patients with other gastrointestinal diseases such as inflammatory bowel disease, rejected the idea (Walker *et al.*, 1995).

Some studies have reported that psychological distress is unrelated to irritable bowel syndrome but influence on medical care-seeking (Whitehead *et al.*, 1988). But some investigators didn't find difference in mental health status between healthcare seekers and healthcare non-seekers (Mykletun *et al.*, 2010; Tang *et al.*, 2008) and even community sample with IBS symptoms report stress and poorer mental health (Gralnek *et al.*, 2000).

However, the study of young adults from New Zealand reported that IBS was not significantly associated with psychiatric disorder including anxiety disorders (Talley *et al.*, 2001). This gap might be somewhat due to features of subjects, methodological differences in assessment of psychological factors or cultural differences in somatic presentations of psychological problem.

In the present study we found that patients with IBS suffered from poor quality of life compared to healthy individuals. Similarly Creed *et al.* (2001) reported that, both abdominal pain and psychological symptoms were associated with impaired health-related quality of life in patients with severe IBS. And results of the study conducted by DiBonaventura *et al.* (2011) indicated that constipation predominant IBS was related to poorer HRQOL, less work productivity and high direct health care costs. Li *et al.* (2003) also found that people with IBS experience substantial impairment in health related quality of life. Persistent abdominal pain, other physical problems, fatigue (Monnikes, 2011) and psychological problems (Tkalcic *et al.*, 2014) that are often associated with IBS cause impairment in patient's quality of life.

For instance Lackner *et al.* (2013) found that generalized anxiety, agoraphobia, tension headache, insomnia, depression and back pain were related to greater illness and poorer quality of life.

With respect to gender, our results showed that IBS were significantly more prevalent in women than in men. We replicate the findings of the study conducted by Canavan *et al.* (2014). By contrast Lee *et al.* (2009) didn't find significant difference between the genders in the prevalence of IBS (Lee *et al.*, 2009).

Williams *et al.* (2006) showed that doctors are more likely to diagnose IBS in women than in men, even when men meet criteria for IBS (Tang *et al.*, 2008). And several studies (Williams *et al.*, 2006) reported that the Rome criteria are more sensitive in diagnosing IBS women than in men (Tang *et al.*, 2008).

We also found more prevalence of IBS in patients from urban areas compared to those of from rural areas. This maybe because complications and multiple stressors in urban areas make people prepared to different diseases. Consistent with Mykletun *et al.* (2010), no difference was found in prevalence of IBS infection between patients with different Levels of education.

In conclusion, patients with IBS are more likely to suffer from anxiety and burdens of illness on quality of life. Our results have implications for clinicians who dealing with patients with IBS. And support the claim of the need for psychological interventions in management of patients with IBS.

The strength of the present study is that diagnosis of IBS was made by gastroenterologist in addition to completing Rome III questionnaire. While in some previous studies the diagnosis was based on the participant's report of their condition. Some limitations should, however, be taken into account. The participants selected from referral centers, which means the findings should be generalized to patients who are not in care medical centers, with caution. Moreover, the study was cross sectional and could not demonstrate the causal relationship between variables.

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