



## Comparison of Psychological Factors in Patients with Irritable Bowel Syndrome and Inflammatory Bowel Diseases

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### Authors' contributions

This work was carried out in collaboration between all authors. Authors MF and JSS designed the study, performed the statistical analysis, wrote the protocol and author FK wrote the first draft of the manuscript and managed the analyses of the study. Authors MK and MG managed the literature searches. All authors read and approved the final manuscript.

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### ABSTRACT

**Introduction:** Irritable bowel syndrome (IBS) and Inflammatory Bowel Disease (IBD) are two common diseases of lower gastrointestinal symptoms and discomfort. Although research has demonstrated the influence of psychological processes on gastrointestinal functions, few studies compared the role of psychological factors in IBS and IBD disease. The present study aimed to assess the psychological factors in patients suffering from IBS and IBD.

**Methodology:** This current cross-sectional study was done on 90 subjects with diagnosed IBD (15

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women, 15 men), IBS (15 women, 15 men), and 30 non-IBS/non-IBD in the Gastroenterology Department of Babol University of Medical Sciences. All subjects filled out three questionnaires; Rahim Organizational Conflict Inventory-II (ROCI-II), Symptom Checklist-90-Revised (SCL-90-R), and 20-item Toronto Alexithymia Scale (TAS-20).

**Results:** The IBS and IBD patients had higher scores in unconstructive management conflict (dominating and avoiding) ways than the controls, but did not differ from each other. Although both the IBS and IBD patients had higher alexithymia scores than control subjects, IBS patients were more alexithymic than IBD patients. Significantly, higher scores were found in patients with IBS compared to IBD for some psychiatric symptoms (depression  $17.2\pm 11.3$  vs  $10.7\pm 6.8$ , anxiety  $12.7\pm 8.2$  vs  $7.5\pm 4.5$ , and the total score of psychiatric symptoms  $115.4\pm 62.6$  vs  $83.3\pm 44.8$ ).

**Conclusion:** Although both the IBS and IBD patients experienced more psychiatric symptoms, unconstructive conflict management styles, and alexithymia than controls, IBS patients had worse psychiatric and alexithymic symptoms than IBD.

*Keywords: Irritable bowel syndrome; inflammatory bowel disease; conflict management; psychiatric symptoms; alexithymia.*

## 1. INTRODUCTION

Irritable bowel syndrome (IBS) and Inflammatory Bowel Disease (IBD) are two common chronic digestive disorders with many similar symptoms but with differing pathophysiologies. IBS and IBD are distinct conditions with some important overlaps [1]. The signs and symptoms of IBD share many similarities with IBS, like abdominal pain, bloating, and diarrhea.

IBS as one of the large groups of functional gastrointestinal disorders is defined as abdominal pain and altered bowel habits in the absence of an organic explanation [2]. The prevalence of IBS has been reported to range from 10-22% in Western countries [3], 4% to 20% in different Asian nations [4,5], and a worldwide prevalence of 10% to 15% [6]. IBS impairs quality of life and influences absenteeism and direct and indirect healthcare costs [7]. Although there is an increasing evidence for a key role of psychological stress, the majority of IBS people do not seek medical care [8]. Psychiatric disorders, especially depression and anxiety, are more common in IBS patients [9], and psychosocial factors play an important role in the development as well as in the outcome and prognosis of the disease [10].

Inflammatory bowel disease was one of the diseases included in Franz Alexander's psychosomatic model of diseases [11]. Although in the last decades the emphasis was mainly placed on evaluating the physiological factors, it is still accepted that psychosocial factors affect the prognosis of the disorder [12]. There is increasing evidence supporting a probable involvement of inflammatory mechanisms in the

etiopathogenesis of IBS, which has suggested the existence of a close relationship between IBS and IBD [13,14]. Stress has been reported as a contributing factor to the development of post infectious IBS [15] as well as in the flares in IBD [16]. It has been seen in several studies that during periods of remission in IBD, these patients may have symptoms compatible with IBS, with prevalence higher than in the general population [17]. Also, a recent study has shown that IBS prevalence in first-degree relatives of patients with IBD is elevated [18].

"Alexithymia is a personality construct that describes individuals with difficulty describing their emotions in words and instead focus on the details of external events at the expense of articulating their true emotional distress" [19]. Few studies compared the psychiatric symptoms and alexithymia in age, education, and gender-matched functional and organic bowel disorder patients and normal control subjects [19]. No study compared conflict management styles between IBS and IBD. Also, few researches are available regarding the role of psychological factors in Iranian population with IBS or IBD diseases. The aim of this research was to compare the psychiatric problems of IBS to IBD patients. Our hypothesis was that the psychological factors are different between IBS and IBD patients. We measured psychiatric symptoms (depression, anxiety, somatization, interpersonal sensitivity, obsessive-compulsiveness, paranoid ideation, hostility, phobic anxiety, psychoticism) alexithymia (difficulties in identifying feelings, describing feelings, externally oriented thinking), and management conflicts styles (integrating, obliging, dominating, avoiding, and

compromising) in IBS patients, IBD patients and control individuals.

## 2. METHODOLOGY

### 2.1 Patients

The study appertained to patients who underwent initial colonoscopy at two teaching hospitals of Babol University of Medical Sciences from March 2012 to November 2013. The case notes of all the patients were screened by two paramedical students associated with the study to determine their recruitment eligibility. Patients with first experience of lower gastrointestinal symptoms entered the study. Thus, the patients diagnosed with history of previous IBS/IBD were excluded. All of the patients were 20 to 65 years old and had finished higher than primary school. The biochemical, ultrasonographic, and colonoscopic examinations were performed to differentiate IBS/IBD. After assessing the inclusion criteria (symptoms, age, and education) and clinical tests, the patients were referred to a gastroenterologist to confirm their IBS/IBD diagnosis. Patients without any structural organic gastrointestinal diseases according Rome III criteria were diagnosed as IBS [20]. Thus, 30 patients (15 women, 15 men) with IBS diagnosed entered the study. Patients with endoscopic features of ulcerative colitis and Crohn's colitis in colonoscopy are diagnosed as IBD [21]. Patients with gastroenteritis, diverticulitis, intestinal radiation injury, thyroid disorders, and colon cancer were excluded. 30 patients (15 women, 15 men) with IBD diagnosed [15 ulcerative colitis, 15 Crohn's disease] who were matched with IBS groups in age, gender, education and marital status was entered the study. A control group, consisting of 30 patients with no history of severe psychiatric disorder (like Schizophrenia, Bipolar disorders) or gastroenterological disorder or current symptoms, and similar to the IBS / IBD groups in age, gender, education and marital status, was selected from the patients admitted to other outpatient clinics during the study period. Written informed consent was obtained from all subjects. All of the participants in three groups completed the Symptom Checklist-90-Revised (SCL-90-R), Rahim Organizational Conflict Inventory-II (ROCI-II), and 20-item Toronto Alexithymia Scale (TAS-20). All aspects of this study were approved by the Medical Ethics Committee of the Babol University of Medical Sciences.

At first, the three study groups were compared in age variable using ANOVA test and education

status with  $\chi^2$  test. Then, all variables were entered in a multivariate analysis of variance model (MANOVA).  $P < .05$  was regarded as statistically significant.

### 2.2 Questionnaires

#### 2.2.1 SCL-90-R

The psychiatric symptoms were assessed with the Symptom Checklist-90-Revised (SCL-90-R), a self-rating inventory with 9 clinical scales for somatization, interpersonal sensitiveness, obsessive-compulsiveness, hostility, phobic anxiety, paranoid ideation, depression, anxiety, and psychoticism. The total scores are considered to be the measures of overall psychiatric symptoms. The SCL-90-R is a reliable and valid measure of psychiatric symptoms and is widely used in psychosomatic research [22].

#### 2.2.2 TAS-20

Alexithymia was evaluated with the self-reported 20-item Toronto Alexithymia Scale (TAS-20), which is a widely-used and well-validated questionnaire of this construct [23]. This scale contains 20 items and 3 subscales; difficulty in identifying feelings (DIF, 7 items), difficulty in describing feelings (DDF, 5 items), and externally oriented thinking (EOT, 8 items). The subscale scores vary from 1 to 5 (strongly disagree to strongly agree). A valid Persian questionnaire of the TAS-20 was applied in this study [24].

#### 2.2.3 ROCI-II

The questionnaire consisted of 28 items, each item is rated from strongly agree (1) to strongly disagree (5). The five styles are named *integrating* (solving a problem together), *obliging* (accommodating the wishes of the others), *dominating* (using one's influence to get one's ideas accepted), *avoiding* (trying to keep disagreements with others to oneself in order to avoid hard feelings), and *compromising* (proposing a middle ground for breaking deadlocks). The subscales describe two conflict management methods; constructive (integrating and obliging) and unconstructive (dominating and avoiding). The internal consistency index and test-retest reliability were acceptable [25].

### 2.3 Statistical Analysis

Three groups of subjects were compared in educational status using  $\chi^2$  test and age with

ANOVA. Multivariate Analysis of Variance Model (MANOVA) was used to compare the mean of all psychological variables (SCL-90, TAS-20, and ROC II) among IBS, IBD, and control groups. Pair-wise comparisons were performed using t-tests with the Bonferroni correction for multiple comparisons.

### 3. RESULTS

Table 1 shows that there was no difference among IBS, IBD and control individuals in characteristic baseline.

Table 2 shows the mean scores obtained by the three subgroups on the SCL-90, ROCI-II, and TAS-20 in IBS, IBD, and control subjects. The results of multivariate analysis of variance are shown in Table 2. MANOVAs on SCL-90 subscales revealed a significant effect for the groups in all psychological symptoms ( $p < 0.05$ ). Pair-wise comparisons with Bonferroni test revealed that IBS patients had significantly higher mean of subscales of SCL-90 (depression  $p < 0.001$ , anxiety  $p < 0.001$ , somatization  $p < 0.05$ , obsessive-compulsion  $p < 0.01$ , interpersonal sensitivity  $p < 0.01$ , psychoticism  $p < 0.05$ , hostility  $p < 0.05$ , paranoid  $p < 0.05$ , and the total score of SCL-90  $p < 0.001$ ) more than control group. Significantly, higher scores were found in patients with IBD compared to control subjects for most psychiatric symptoms (depression  $p < 0.01$ , somatization  $p < 0.01$ , anxiety  $p < 0.05$ , obsessive-compulsion  $p < 0.01$ , interpersonal sensitivity  $p < 0.05$ , paranoid ideation  $p < 0.05$  hostility  $p < 0.05$  hostility, and the total score of psychiatric symptoms  $p < 0.001$ ). Also, IBS patients had significantly higher mean depression and anxiety subscores as well as higher mean total SCL-90 scores than IBD patients ( $p < 0.05$ ). There were no differences between IBS and IBD patients in terms of somatization, obsessive-compulsion, interpersonal sensitivity, psychoticism, hostility, paranoid ( $p > 0.05$ ).

MANOVAs on TAS-20 subscales revealed a significant effect for the groups in all subscales and total scores ( $p < 0.05$ ). Pair-wise comparisons revealed higher DIF, DDF, and total alexithymia scores in IBS patients than control individuals ( $p < 0.05$ ). There were no differences between IBS and control groups in terms of EOT ( $p > 0.05$ ). Significantly higher scores were found in patients with IBD compared to control group for DIF and total alexithymia scores ( $p < 0.05$ ). There were no differences between IBD and control groups in

terms of DDF and EOT [ $p > 0.05$ ]. Significantly higher scores were found in patients with IBS compared to IBD for DIF and total alexithymia scores ( $p < 0.05$ ).

MANOVAs on ROC-II subscales revealed a significant effect for group in all ways in conflict management ( $p < 0.001$ ) except compromising. Pair-wise comparisons using t-test Bonferroni test showed that both IBS and IBD patients had significantly higher mean of constructive ways score [obliging and integrating ( $p < 0.010$ ) than control group. Also, both IBS and IBD patients had significantly lower mean of unconstructive ways score (dominating and avoiding) than control group. There were no differences between IBS and IBD patients in the mean scores of all subscales of constructive and unconstructive ways of conflict management.

### 4. DISCUSSION

The results show that although both IBS and IBD had more psychiatric symptoms compared to control subjects, the mean of some symptoms and total scores of psychiatric symptoms was higher in the IBS than in the IBD. In a similar study, Jones et al. [19] reported that IBS and IBD patients had higher scores on measures of psychiatric distress than controls.

Another similar study reported that Italian outpatients with IBS and IBD had comparably increased scores on the SCL-90 but that patients with IBS reported more recent stressful life events [26]. In contrast with these findings, Jones et al. [19] support the concept that the levels of psychiatric distress in patients with IBD can be comparable with the levels encountered in patients with IBS. A study reported patients with IBS and IBD were within the normal range for depressive scores and did not differ from one another [27]. There are some controversies about the comorbidity of clinical anxiety and depression in IBD patients. While some researchers [27,28] found no evidence of any association between these psychiatric disorders, other researchers [29,30] confirmed that depression and anxiety are common in IBD patients. The prevalence of anxiety and/or depression has been estimated to be as high as 29–35% during remission [31] and 80% for anxiety and 60% for depression during relapse [32]. Robertson et al. [33] and Mikocka-Walus et al. [34] distinguished between these disorders and reported that anxiety is more prevalent than depression in IBD.

**Table 1. Demographic characteristic of three group subjects**

Group	IBS	IBD	Control	P-value
<b>Age</b> ( Mean , SD)	33.13±9.16	34.43±11.14	33.17±10.58	0.252
<b>Education</b>				
Under high school (N, %)	17(56.6)	15(50)	14(46.7)	0.535
High school/ University (N, %)	13(43.4)	15(50)	16(53.3)	

**Table 2. Psychological profile of patients with IBS, IBD, and control group**

Variables	IBS mean, SD	IBD mean, SD	Control mean, SD	P- value
<b>SCL-90</b>				
Depression	17.27±11.39	10.70±6.80	7.97±4.71	0.001
Anxiety	12.73±8.20	7.50±4.53	5.53±3.87	<0.001
Somatization	13.50±10.07	11.77±12.98	7.67±7.16	0.087
Obsessive-compulsion	15.13±7.85	13.13±6.07	9.03±4.88	0.001
Interpersonal sensitivity	12.80±7.35	9.80±6.00	7.60±4.46	0.001
Psychoticism	12.73±8.20	7.33±3.92	8.43±5.27	0.001
Paranoid ideation	10.83±4.76	9.67±3.93	6.90±3.51	0.001
Hostility	7.43±5.55	6.03 ±3.03	4.33 ±3.68	0.021
Phobic anxiety	5.03±4.46	3.23 ±2.75	2.57±2.86	0.020
Total score	115.40±62.66	83.30 ±44.80	54.77±34.98	0.001
<b>TAS-20</b>				
Difficulty identifying feelings	25.53±4.36	21.97±4.75	20.33±3.29	<0.001
Difficulty describing feelings	16.63±3.33	15.41±3.69	14.70±3.05	0.023
Externally-oriented thinking	23.37±3.87	22.63±3.45	20.40±3.42	0.005
Total score	65.53±8.11	60.01±7.55	55.43±6.79	<0.001
<b>ROCI-II</b>				
Integrating	26.00±6.11	26.33±5.59	29.23±2.94	0.029
Obliging	20.30±3.60	20.13±3.00	23.90±20.70	0.006
Dominating	18.10±3.77	17.73±3.56	15.60±2.99	0.024
Avoiding	18.10±3.85	18.97±3.84	16.17±1.55	0.040
Compromising	19.80±4.33	17.20±4.48	17.90±3.61	0.051

Range of scores: depression, 0-52; anxiety, 0-40; Somatization, 0-48; obsessive-compulsion, 0-40; interpersonal sensitivity, 0-36; psychoticism, 0-40; paranoid ideation, 0-24; hostility, 0-24; phobic anxiety, 0-28; total score of SCL-90; 0- 360. integrating, 1-35 obliging, 1-30; dominating, 1-25; avoiding, 1-30; compromising 1-20. difficulty identifying feelings, 1-35; difficulty describing feelings, 1-25; externally-oriented thinking, 1- 40; total score of TAS-20, 1-100

According to our results, DIF and total alexithymia score of IBS was higher than controls. Also, DIF and total alexithymia score of IBS patients were higher than IBD. Although some studies reported that those patients with functional gastrointestinal disease are more alexithymic than control [35-37] few studies compared alexithymia in IBS and IBD patients. Jones et al. [19] reported that IBS and IBD patients had higher scores on alexithymia, but did not differ from one another. Our study had methodological differences with the Jones' report that might have led to the different outcomes. The first difference was related to the patient population (in Jones' study, the subjects were recruited both from the primary care and gastroenterology clinics, whereas in the present study the subjects were from endoscopy ward of

the hospitals). The second difference depended on the control group (in the Jones' study the participants were recruited via advertisement, whereas the control group in the present study was those admitted to outpatient clinics). The high range of alexithymia symptoms in IBS and IBD patients suggest that alexithymia may play a role in the formation or aggregation of experiencing of IBS or IBD.

Our data supported that IBS and IBD patients had higher scores on unconstructive management conflict ways than controls, but did not differ from the others. No study previously had been published to assess or compare the conflict management styles in IBS and IBD patients.

There are several limitations that generalizing these results should be made with caution. First, we relied exclusively on self-reported measures when assessing the psychiatric problems and alexithymia. Second, IBD patients included with both ulcerative colitis and Crohn's diseases. Low sample size did not allow us to evaluate the differences between the two groups. Further research is recommended to compare the psychological profile in ulcerative colitis and Crohn's diseases. Third, we compared psychological factors in patients with IBS and IBD without a link to symptom severity of the diseases. Fourth, IBS and IBD patients used routine gastrointestinal drugs that could have influenced psychological symptoms.

## 5. CONCLUSION

In conclusion, although both the IBS and IBD patients experienced more psychiatric symptoms, unconstructive conflict management styles, and alexithymia than controls, IBS patients had worse psychiatric and alexithymic symptoms than IBD. This study proposes that IBS and IBD should be referred to psychology/psychiatry departments to assess them and treat their psychological problems.

## ETHICAL APPROVAL

Ethical approval was granted by Babol University of Medical Sciences.

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## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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