

## Bloating in irritable bowel syndrome

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### ABSTRACT

**Aim:** The purpose of this study was to describe the occurrence of self report bloating and related factors in patients with irritable bowel syndrome (IBS).

**Background:** Bloating symptoms are common in patients with IBS and have significant impact on normal daily function.

**Patients and methods:** This study was a community-based cross-sectional survey that conducted using a valid questionnaire base on Rome III criteria. Univariate analysis was used for investigation about distribution of self reported bloating according to demographic and psychological factors in irritable bowel syndrome patients.

**Results:** Out of 18180 subjects under study, 198 cases met criteria for the diagnosis of the irritable bowel syndrome according to criteria ROME III and 61.6% reported bloating symptoms. Bloating symptoms were more prevalent among patients with intermittent symptoms and diarrhea than in patients with constipation. Catastrophic events and depression were independent risk factors for bloating.

**Conclusion:** Findings of this study support the clinical impression regarding the high prevalence of bloating symptoms in patients with irritable bowel syndrome. Further studies are needed to understand the role of physiological and psychological factors and their interaction in development of bloating in irritable bowel syndrome patients.

**Keywords:** Irritable bowel syndrome, Bloating, Rome III.

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### Introduction

Abdominal bloating is an important clinical problem. It is one of the most common and bothersome complaints in patients with functional gastrointestinal disorders (1-3). Bloating symptoms are reported by 10%–30% of the general population (4). Bloating has a significant

impact limiting the ability to perform normal daily activities (4).

Bloating symptoms are common in patients with the irritable bowel syndrome (IBS) (5). Gas and including bloating are commonly reported by IBS patients and have significant impact on normal daily function. Bloating is often described as one of the more distressing symptoms associated with IBS (6). Bloating may result from increased gas production from bacterial fermentation of undigested food, retarded gas

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transit, and heightened sensitivity of the gut to normal luminal gas volumes, or dysfunctional abdominal wall musculature (7).

In one investigation, bloating was rated the most bothersome symptom by 60% of IBS patients, whereas 29% considered pain to be most intrusive (8). In another study, up to 90% of IBS patients reported that they suffer from bloating (1). Abdominal distention and bloating are more often noted by women with IBS than men. In women bloating symptoms increase in relation to menses (9). Most studies report a higher prevalence of bloating with constipation-predominant IBS than those with diarrhea predominant IBS, although some investigations report no relation of bloating to a particular defecation profile (10-12). Bloating in IBS may be worsened by stress and relieved by relaxation (13).

The purpose of this study was to describe the occurrence of self report bloating and related factors in patients with IBS.

## Patients and Methods

This study was a community-based cross-sectional survey conducted from May 2006 to December 2007 in the Tehran province, Iran. 4 cities and a small part of Tehran, capital of Iran, were included.

Collecting data and random selection were performed in the "National Registry System" of Iran and recruitment of participants were totally based upon national postal codes, and national ID numbers. 19,200 adult persons (>18 years) out of 10,000 000 residents of this area were randomly selected, of whom 18,180 persons gave their consent to be finally interviewed.

Trained health personnel from which corresponding local health centre referred to each selected house. These trained health personnel conducted door-to-door invitations. Before the interview survey, the interviewer explained the

purpose of these questions to all eligible individuals and requested their participation. The individuals were informed that attending the interview was not compulsory. Informed consent for enrolment was obtained, and patient anonymity was preserved. The research protocol was approved by the Ethics Committee of Research Institute for Gastroenterology and Liver Diseases, Shahid Beheshti Medical University.

Participants were excluded if they were pregnant, had records of experiencing major psychotic episodes, mental retardation or dementia, hiatal hernia, or if they had significant illness that might have impaired their ability to complete the questionnaire. Patients who did not complete the questionnaire were excluded as well.

The questionnaire included two parts, the first part that was conducted by trained health personnel, consisted of questions, in which personal and family characteristics such as age, sex, occupation, educational level, household income, psychological factors including: self reported stress, anxiety and depression, catastrophic events such as Death of a close relative, Car accident, Bankruptcy or severe disease and also about 11 gastrointestinal symptoms including: abdominal pain or distress, constipation, diarrhea, bloating, heartburn, acid regurgitation, proctalgia, nausea and vomiting, fecal incontinence, existence of blood in the stool or black stool (melaena), weight loss or anorexia, and difficulty in swallowing (14-16).

Those who reported any of the above symptoms were referred to assigned physicians to be questioned about symptoms of IBS according to the ROME III criteria.

The assigned physicians used a standardized questionnaire that contained questions about GI symptoms. This questionnaire was translated into Persian from the official ROME III questionnaire. The accuracy of translation was controlled by several courses in translation between Persian and

English. The validity and reliability of the Persian questionnaire was tested in advance in a pilot study on 400 participants from city of Damavand. For validity study, the language, content, concurrence, and construct validities were examined. The test-retest reliability was good and the Cronbach alpha coefficient values were above 0.7 for all of the major symptoms included in the tool. Irritable bowel syndrome was defined as an individual who met Rome III criteria as follows; at least 3 months, associated two or more of criteria below: 1) improvement with defecation; 2) onset associated with a change in frequency of stool; 3) onset associated with a change in form (consistency) of stool. Bloating considered as self report bloating.

All statistical analysis carried out using SPSS. Continuous variables are presented as mean  $\pm$  standard deviation or median, and other parameters as frequency and percentage. A P-value of 0.05 or less was considered statistically significant and all reported P values were two sided.

## Results

Out of 18180 subjects under study, 198 cases met irritable bowel syndrome according to criteria ROME III, of which 139 were female and 59 were male.

Forty-four IBS patients (22%) were younger than 30 years, 65 were aged between 30 and 45, and 89 more than 45 years (Table 1).

One hundred and eighty-six IBS patients (94%) had abdominal discomfort or pain that was relieved by defecation. 70% (n=139) reported that onset associated with a change in frequency of stool and 75% with a change of consistency of stool. The pain was periumbilical in about half of the IBS patients: 79 patients had epigastric and 37 had hypogastric pain. The least likely sites of pain were left upper (6%) and right upper quadrants

(3%), respectively. Only 7% of IBS patients had experienced generalized abdominal pain.

Constipation was predominant in 52% of IBS cases (IBS-C), diarrhea was predominant in 17.7% (IBS-D), and 8.1% experienced intermittent diarrhea and constipation (IBS-I).

**Table 1-** Demographic characteristics of subjects under study

	Number	Percent
Gender		
Male	59	29.8
Female	139	70.2
Age		
<30	44	22.2
30-45	65	32.8
>45	89	44.9
IBS subtype		
Constipation	103	52
Diarrhea	35	17.7
Intermittent	16	8.1
Marital status		
Married	166	83.8
Single	18	9.1
Widowed and divorced	14	7.1
Education		
Primary or lower	50	25.3
Lower diploma	65	32.8
Diploma	52	26.3
University	31	15.6

Of the 198 IBS patients in this study, 61.6% (n= 122) reported bloating symptoms, the first most bothersome symptom.

No significant difference observed between men and women regarding bloating symptom but perimenopausal women were most suffer from bloating(p<0.05). Also, older 45 years persons reported bloating symptoms higher than younger, but this difference was not significant.

Bloating symptoms were more prevalent in those with intermittent changes in stool frequency than in patients with continuous diarrhoea or constipation ( $p>0.05$ ). Bloating symptoms were rated as the most bothersome symptom in three groups. Bloating symptom was not influenced by body mass index (BMI), stress and anxiety but catastrophic events and depression were increase sensation of bloating Table 2.

**Table 2.** Distribution of bloating symptom according to sex, age, BMI, IBS subtype and psychological factors

	N (%)	p-value
Sex		0.52
Male	36(29.5)	
Female	86(70.5)	
Age		0.76
<30	30(22.7)	
30-45	41(31.1)	
>45	61(46.2)	
IBS subtype		0.33
Constipation	60(58.3)	
Diarrhea	23(65.7)	
Intermittent	13(81.3)	
Body Mass Index		0.71
< 18.5	3(2.9)	
18.5-24.9	42(40)	
25-29.9	47(44.8)	
>30	13(12.4)	
Perimenopausal women		0.045
Yes	60(67.4)	
No	26(52)	
Psychological factors		
Stress	103(60.9)	0.68
Depression	86(64.7)	0.02
Anxiety	101(62)	0.85
Catastrophic events	58(65.9)	0.03

## Discussion

Our findings support the high prevalence and the considerable effect of bloating symptoms in patients with IBS. More than 60% of the patients participated in our study.

Bloating symptoms were reported 58.3, 65.7 and 81.3% by IBS-C, IBS-D and IBS-I, respectively that is inconsistent with previous reports that noted high prevalence of bloating in IBS-C patients (5, 11). The differences between these studies might relate to differences in the patient's population because unlike our study that recruited from a general population, more than half of the participants in the mentioned studies were from tertiary referral centers.

In present study there was no significant difference in the prevalence of bloating observed between men and women. On further analysis, peri-menopausal women had significantly bloating symptoms than other patient groups (17). This may relate to the effects of female hormones. Bloating symptoms were found to be increased in relation to female patients' menses and to be associated with symptoms of uterine cramping and breast tenderness in perimenopausal women with IBS. The reported gender differences might also represent differences in sensory processes, autonomic responses, and/or cognitive hypervigilance (9).

In terms of the most bothersome symptoms, we found that bloating symptoms were rated as the most bothersome symptom in IBS patients. These findings are consistent with previous anecdotal reports (5, 8).

Although some studies indicate that bloating in IBS may be worsened by stress and relieved by relaxation (13), our study did not identify a significant association between stress and anxiety with bloating, but depression and catastrophic events had direct impression on rate of bloating.

A limitation of this study is the lack of a healthy control group to enable comparison of our findings regarding the prevalence of these

symptoms with their prevalence in the healthy population. Another limitation of our study is that the information was based on questionnaire and self-reporting reports and it was not possible to evaluate the accuracy of self-reported bloating and psychological factors.

In conclusion, this results support the clinical impression regarding the high prevalence and considerable impact of bloating symptoms in patients with IBS. We found that the prevalence and relative severity of bloating symptoms differ by IBS subtype, psychological factors and that these symptoms are associated with decrease in QOL and increase in healthcare utilization and use of medications. Studies targeted to psychological distress in patients with IBS could help health care providers more fully understand the components of disabling symptom clusters.

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