

# Evaluation of irritable bowel syndrome prevalence in medical students



Samin Maghsoudi<sup>1</sup>, Azam Teimouri<sup>2,3\*</sup>

<sup>1</sup>Faculty of Medicine, Isfahan University of Medical Sciences, Isfahan, Iran

<sup>2</sup>Department of Gastroenterology, Isfahan University of Medical Sciences, Isfahan, Iran

<sup>3</sup>Isfahan Gastroenterology and Hepatology Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

## Correspondence to:

Azam Teimouri, E-mail: a\_teimouri@med.mui.ac.ir

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## Abstract

**Introduction:** Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder and requires early diagnosis due to its negative impacts on the quality of life. According to the lifestyle pattern of medical students, IBS has a significant prevalence in these individuals.

**Objectives:** The present study aims to investigate the prevalence and factors associated with IBS in medical students.

**Patients and Methods:** This cross-sectional study has been conducted on 100 medical students studying at Isfahan University of Medical Sciences in 2019-2020. The Rome IV diagnostic criteria were administered to diagnose IBS and individuals were divided into four groups of constipation-dominant (IBS-C), diarrhea-dominant (IBS-D), mixed type (IBS-M) and unspecified (IBS-U). The association of studying grade, gender and residence with IBS was evaluated.

**Results:** The mean age of the students was  $23.2 \pm 4.8$  years, including 68 (68%) women. According to Rome -IV criteria, 24 (24%) ones were diagnosed with IBS. The IBS cases were dominantly in IBS-C group (54.16%). IBS was not associated with gender ( $P=0.498$ ), educational grade ( $P=0.661$ ) and type of residence ( $P=0.562$ ) in the studied medical students.

**Conclusion:** According to the present study, the prevalence of IBS was 24% among medical students, which was higher among women. Most patients had IBS-C, but IBS did not show a statistically significant relationship with gender, educational grade and type of residence.

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## Introduction

Irritable bowel syndrome (IBS) is among the functional gastrointestinal disorder and one of the most common outpatient clinical diagnoses (1). Epigastric discomfort or abdominal pain with alteration in bowel habits with no anatomical or histopathological change in gastrointestinal system are the hallmarks of IBS (2).

The prevalence of IBS considerably varies around the world, which is relatively related to the diagnostic criteria. According to epidemiological studies, 5.7%-34% of different populations are struggling with IBS (3). The studies in the western countries represent 17%-22% of IBS prevalence, while a wide range of 2.3%-34% in Asian countries has been noted (4,5).

The pathogenesis of IBS remained unknown and various biological, psychological and social factors such as gender, dietary regimen, lifestyle, stress, post-traumatic stress disorder and psychological disturbances have been stated (2,6,7).

## Key point

Irritable bowel syndrome (IBS) is a functional gastrointestinal disorder that affects daily performance and quality of life negatively. Medical students are at higher risks for IBS development due to the stressful nature of their life and occupation. Providing preventive strategies to minimize the risk of IBS in this critical population can help better performance of medical students that are future physicians.

Medical students experience numerous factors that make them prone to IBS. This critical population faces distressful conditions, including high levels of emotions, heavy examinations, occupational competition, improper dietary regimen and lifestyle, and significant responsibilities to the patients (8). All these factors clarify that the prevalence of IBS is high among medical students (3,9,10).

IBS complications are considerably noteworthy as it impairs quality of life; reduce educational success, increases

absences at university and work. Nevertheless, the present medications are limited, and paucity of knowledge is available for therapeutic approaches for IBS (11).

### Objectives

The current study is among the restricted ones in Iran assessing the prevalence and symptoms of IBS in medical students of Isfahan University of Medical Sciences.

### Patients and Methods

#### Study design

The current cross-sectional study has been conducted on 100 medical students of Isfahan university of medical sciences from January to July 2020.

Studying at any stage of medicine at Isfahan university of medical sciences was the inclusion criterion. Reluctance to participate in the study and the presence of any gastrointestinal alarm signs (dysphagia, odynophagia, anorexia, excessive weight loss, and nocturnal abdominal pain), education drop out, inflammatory bowel disease, positive family history of gastric or large intestine cancers were considered as the unmet criteria. Over 20% defect in filled questionnaires was the exclusion criterion.

The studied population entered into the study through convenience sampling.

The demographic information, including age, gender and residence (personal house or dormitory) was entered into the study checklist.

#### Irritable bowel syndrome

Rome IV criteria were administered to diagnose IBS. The patients with recurrent abdominal pain for at least once a week since the previous three months with the least two of the symptoms below were determined as IBS:

- Be related to defecation (probably improved by defecation, deteriorated or with no change),
- Be related to daily defecation frequency,
- Be associated with fecal appearance (12).

Besides, based on the dominant manifestation, IBS was divided into 4 groups of constipation dominant (IBS-C), diarrhea dominant (IBS-D), mixed (IBS-M) and unclassified (IBS-U). Therefore, the IBS subtype was determined based on the dominant presentations of bowel habits in days with abnormal bowel movements. Accordingly, IBS-C and IBS-D are defined if the predominant complaint of the patient in the days with bowel irritability is constipation or diarrhea, respectively. Mixed type is indicated by concurrent presentation of diarrhea and constipation, while at least one-fourth of the defecations are diarrhea. Eventually, if none of the above criteria is met, the patient is classified as IBS-U (13). The sensitivity and specificity of Rome IV for IBS diagnosis are 62.7% and 97.1%, respectively (14).

#### Data analysis

The obtained data were imported to the Statistical Package

for the Social Sciences (SPSS) (IBM Corp. 2019. IBM SPSS Statistics for Windows, version 26.0. NY, EUA). The descriptive data were presented as frequencies, percentages, mean and standard deviation. Chi-square or Fishers' exact tests were administered to compare the categorical parameters. Independent student *t* test was applied to compare quantitative data. *P* value of less than 0.05 was considered as the significant level.

### Results

One hundred and six medical students were included in the study among which 100 ones completed the questionnaires. Mean age of the studied population was  $23.2 \pm 4.8$  years old (range: 18-28 years) with predominance of females gender (68%). Most of the participants were residents of dormitory (78%) and studied in physiopathology (64%), basic sciences (21%) and internship (15%) stages, respectively.

Based on Rome-IV, 24 students, including 18 (75%) females had IBS. The most common complaint of the patients was abdominal pain improvement by defecation (91%). The detailed information is presented in [Table 1](#).

Besides, most of the studied patients were categorized in constipation dominant (IBS-C) group with 13 ones (54.16%). The other categories of IBS, included IBS-D, IBS-M and IBS-U with five (20.83%), four (16.67%) and three (12.5%) cases, respectively. Based on [Table 2](#), IBS was not associated with gender ( $P=0.498$ ), studying stage ( $P=0.661$ ) and residence ( $P=0.562$ ) in the medical students.

### Discussion

Functional gastrointestinal disorders are among the most common etiologies of outpatient clinical referrals and the patient refer to the physicians because of impaired quality of life. IBS is one of the prevalent gastrointestinal disorders that despite inadequate knowledge about its etiology is remarkably associated with lifestyle and psychological disturbances (1). The lifestyle, irregular sleep time, permanent stress and dietary regimen make medical students at increased risk for functional gastrointestinal disorders, IBS in particular (15).

In this study, 100 medical students were assessed according to Rome IV criteria among which 24 ones (24%) were diagnosed with IBS. Population-based studies revealed diverse prevalence of IBS in different communities (16,17). Nevertheless, the studies are aligned with each other that IBS is more prevalent among medical students than the general population (15). Naem and colleagues applied Rome III criteria and presented 28.3% of medical students were involved with IBS (2). This rate accounted for 33.3% of the medical students who participated in Liu et al study conducted in the East of Asia (1). In line with these studies, the other ones presented the frequencies of 20.6% in Lebanon (18), 20.6% in Canada (19), 22.2% (20) and 35% (10) in Japan. On the other hand, the studies in Nigeria (21) and Malaysia (22) presented less

**Table 1.** The symptoms of irritable bowel syndrome in the medical students

Irritable bowel syndrome symptoms	Female No. (%)	Male No. (%)	Total No. (%)
Change in the frequency of defecation	14 (73.6)	5 (83.3)	19 (76)
Change in fecal appearance	16 (88.8)	5 (83.3)	21 (84)
Defecation urgency	13 (72.2)	4 (66.6)	17 (68)
Change in abdominal pain by defecation	17 (94.4)	5 (83.3)	22 (91)

**Table 2.** The association of irritable bowel syndrome and demographic characteristics of the medical students

Variables	Total (n=100)	Irritable bowel syndrome		P value
		Healthy (n=76)	Patients (n=24)	
Gender				
Female	69 (69%)	51 (67.4%)	18 (75%)	0.498
Male	31 (31%)	25 (32.6%)	6 (25%)	
Educational level				
Basic sciences	21 (21%)	18 (23.9%)	3 (12.5%)	0.661
Physiopathology	64 (64%)	46 (59.8%)	18 (75%)	
Internship	15 (15%)	12 (16.3%)	3 (12.5%)	
Residence				
Native	22 (22%)	16 (16.7%)	6 (25%)	0.562
Dormitory	78 (78%)	60 (78.3%)	18 (75%)	

than 15% in their medical students. However, the current study is similar to most of the other studies in this area; it seems that the educational protocols, daily working time, psychological burden of working and lifestyle are the factors associated with the incidence of IBS in medical students over the world. The administered instrument to diagnose IBS or include the participant is the other probable factors affecting the measured prevalence.

The most common diagnostic symptom for IBS in our study was the change in pain severity after defecation. This finding is consistent with the other studies that presented change in fecal appearance, frequency of defecation and urgency in defecation following the above one (1,15,23).

Most of the patients were categorized in the IBS-C group which is in agreement with the other studies conducted in Iran; a fact that probably occurs due to the type of dietary regimen and culture of eating in Iran(9,24,25). All the studies have unanimously reported the predominance of IBS incidence in females and IBS-C. In addition, constipation is more common in females. This association is to the extent that female gender is defined as a prognostic factor for IBS-C (24,26).

The other studies declared diverse frequencies of IBS categories. Most of the medical students in China had IBS-M (1). Jemilohun et al represented IBS-M in 57.8% of their study on general population (21).

In our study, females were more affected by IBS; however, this difference was not statistically significant. The higher rate of IBS in female gender is consistent with most of the other population-based studies that presented approximately female to male proportion of 2:1 (1,27).

Besides, in the current report, IBS incidence increased by upgrading of educational level, but not significantly.

This increase in the incidence seems to occur because of impaired sleep times, irregularity and high speed of eating meals, turning to ready meals and increased levels of stress due to responsibilities of visiting the patients. This association has been presented by the other studies on medical students that represented a direct relation between level of stress and IBS (1,28). Ibrahim et al reported the level of stress as the factor associated with IBS and deterioration of the condition by educational upgrading (29).

We found no association between IBS and residence of medical students. Most of the previous studies presented increased risk of IBS development in students living in a dormitory. They found that inappropriate dietary habits, lifestyle and sleep pattern, and the stress due to struggling with a new community and sense of being support-less are the factors associated with IBS in the students living in dormitories (1,19,28).

### Conclusion

According to the current study, IBS had the prevalence of 24% in medical students. Most of the patients had IBS-C. This syndrome was not associated with gender, stage of studying, and residence of the medical students.

### Limitations of study

The most significant limitation of this study is not to include the patients using block sampling which occurred due to inappropriate cooperation of the students studying at higher stages. Although there was no difference in the distribution of IBS in different stages of medical studying, this irregular distribution may have led to a potential bias and should be considered in further studies. The small sample population is another limitation of this

study. Further studies by consideration of more detailed confounders affecting sleep quality are recommended. In addition, we have not evaluated the course of study as a potential risk factor for sleep dysfunction among the studied population.

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#### Authors' contribution

SM and AT were the principal investigators of the study. SM and AT were included in preparing the concept and design. SM and AT revisited the manuscript and critically evaluated the intellectual contents. All authors participated in preparing the final draft of the manuscript, revised the manuscript and critically evaluated the intellectual contents. All authors have read and approved the content of the manuscript and confirmed the accuracy or integrity of any part of the work.

#### Conflicts of interest

The authors declare that they have no competing interests.

#### Ethical issues

The research followed the tenets of the Declaration of Helsinki. The Ethics Committee of Isfahan University of Medical Sciences approved this study. The institutional ethical committee at Isfahan University of Medical Sciences approved all study protocols (IR.MUI.MED.REC.1399.1091). Accordingly, written informed consent was taken from all participants before any intervention. This study was extracted from M.D thesis of Samin Maghsoudi at this university. Moreover, ethical issues (including plagiarism, data fabrication, double publication) have been completely observed by the authors.

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