

Research Article

Prevalence and Indications of Irritable Bowel Syndrome among Female Medical Students of Misurata University in Misurata: Cross-sectional Study

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Abstract

Background: Irritable Bowel Syndrome (IBS) is a common functional gastrointestinal disorder (FGID) characterized by abdominal discomfort and changes in bowel habits without any specific or clear organic pathology. Therefore, IBS is diagnosed based on clinical observation and exclusion of other diseases.

Aim: To determine the prevalence of IBS among female medical students at Misurata University through a cross-sectional clinical investigation.

Materials and methods: A community-based cross-sectional study was conducted among female medical students at the medical faculties of Misurata University. A total of 210 participants were randomly selected from each faculty. Data were collected through in-person interviews. The Rome IV criteria were used for IBS diagnosis. The relationships between the various variables were analyzed.

Results: A high proportion of participants (40.5%) frequently experienced diarrhea, constipation, or both monthly. Improvements after defecation were reported by 23% of patients, changes in stool frequency by 25%, and alterations in stool form by 24.8%. Most participants struggled with stress and anorexia and lacked sufficient knowledge about the therapeutic dietary regimen for IBS. There was a significant variation in waist and neck circumference ($p < 0.05$), as well as a significant correlation ($p \leq 0.05$) between bloating, gastrointestinal motility, family history, and health status.

Conclusion: The study concluded that the prevalence of IBS among female medical students was approximately 25% based on the Rome IV criteria of diagnosis. It also highlighted the lack of knowledge regarding symptoms, risk factors, and dietary management of IBS.

Introduction

Irritable bowel syndrome (IBS) is one of the most common gastrointestinal (GI) disorders and remains a medical challenge in the 21st century. This chronic disease is most commonly seen in patients under the age of 50 years and is characterized by abdominal pain and bowel dysfunction manifesting as constipation, diarrhea, or alternating periods [1,2]. It has three main subtypes: constipation, mainly IBS (C-IBS); diarrhea, mostly irritable bowel syndrome (D-IBS); and irritable bowel syndrome (M-IBS) with both diarrhea and constipation features. A global meta-analysis showed that the

prevalence of IBS was 11.0% and that in adolescents it was higher than in the general population (11.0% vs. 7.8%). The prevalence also varies by gender. In general, the prevalence in women is approximately twice that in men. IBS increases the risk of several conditions, such as digestive disorders [3]. Patients with IBS are at an increased risk of developing Parkinson's disease or epilepsy, which reduces their quality of life [4-6]. The pathophysiology of IBS is complex and multifactorial, involving acute bowel motility. Responses, immune mechanisms, visceral hypersensitivity, psychological stress, and changes in the gut/central nervous system Interaction of the nervous system [7].

More Information

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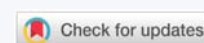
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Keywords: Anorexia; Female medical students; Irritable bowel syndrome; Rome and manning criteria; Stress





In the United States, it has been found that about 70% of IBS patients do not see a doctor. Therefore, the direct and indirect healthcare costs are enormous. Absenteeism, for example, incurs costs because patients with IBS are three times more likely to be absent from work than healthy individuals. Additionally, they use more antidepressants each day to deal with their symptoms [8].

Despite the increasing number of students at Misurata University, they are still considered a minority due to the lack of research-based information on irritable bowel syndrome. Lack of health awareness and increased stressors among Libyan medical students affect their academic performance and attainment, and they find themselves threatened by functional diseases such as IBS. This study sought to contribute to the literature on knowledge of bowel disease and risk factors among Libyan people in Misurata and to update the existing literature on IBS in Libya.

Materials and methods

Site of study

This study was carried out in the medical faculties of Misurata University. These faculties included medicine, dentistry, pharmacy, and health sciences. All of these faculties are located in Misurata City. Misurata lies in northwestern Libya, 187 km (116 mi) east of Tripoli and 825 km (513 mi) west of Benghazi on the Mediterranean coast near Cape Misurata. With a population of approximately 281,000, it is the third largest city in Libya, after Tripoli and Benghazi. It is the capital city of the Misurata District and has been called Libya's trade capital. It is located at a longitude of 32°37'7.533" N and a latitude of 15°09'20.17" E. Its elevation is 7 meters in height, which is equal to 23 ft. [9].

Research design

A cross-sectional study utilizing the Rome IV module questionnaire of IBS was conducted among students of the medical faculties at Misurata University. The research design was selected to provide a framework within which research should be conducted, and answers to the chosen questions in the questionnaire were produced. Awareness of a therapeutic lifestyle and healthy diet for IBS has increased to prevent complications and maintain long-term health.

Study subject

The study interviewed 210 female students aged 18 – 25 years, who were randomly selected from the medical faculties at Misurata University in Libya. All participants were informed about the purpose of the interview, and everyone signed a consent form. The study proposal was approved by the Therapeutic Nutrition Department board and the ethics committee. All procedures were performed in accordance with the ethical standards of Misurata University. The inclusion criteria were being enrolled as a student in the mentioned faculties and being female, without being close to specific age groups.

Study duration

The study was conducted over a period of four months. The time period was April to August 2022. The duration was distributed among the design of the questionnaire, data collection, analysis and interpretation, and report writing.

Data collection procedures

Questionnaires

A structured questionnaire was designed according to the study objectives. The questionnaire comprised four sections. The first part of the questionnaire included general information (marital status and physiological status), the second part included clinical diagnosis, the third part included medical history and lifestyle, and the fourth part included nutrition assessment (anthropometric measurements and dietary assessment).

Diagnosis criteria of irritable bowel syndrome

Rome IV criteria: Recurrent abdominal pain or discomfort with onset at least 6 months before diagnosis, associated with two or more of the following, at least 3 days/month in the last 3 months. Improvement with defecation: onset associated with a change in stool frequency and form (appearance).

Data quality management

A self-developed questionnaire was prepared in English and translated into Arabic. A pre-test of the questionnaire was conducted before actual data collection to check its accuracy and response to analysis and to estimate the time required.

Primary sources: To address the analytical aspects of the research topic, primary data were collected using a questionnaire, which was the main data collection instrument designed specifically for this purpose and distributed among students.

Ethics statement

Written informed consent was obtained from the participants for publication. Ethical approval was granted by the institutional review board (Code: TNERC-2022-024).

Statistical analysis

SPSS Statistics Version 24 and Graphs were used. Descriptive statistics were presented as frequencies and percentages, as well as pie charts. Pearson's correlation (r) was used to study the relationship between variables, and ANOVA was used to test the difference between variables. A p - value less than 0.05 was considered statistically significant.

Results

The medical faculties of the study population. The majority of participants were from the Faculty of Health Sciences (31%, 66), followed by the Faculty of Dentistry (19%, 44), Faculty of Medicine (29%, 40), and Faculty of Pharmacy (21%, 39). The marital status of participants: the majority of participants



were 81% (170) single, compared to 18% (37) married and 1% (3) divorced ($p = 0.087$).

The replies of participants about how many times they complained of diarrhea or constipation or a mix: the majority of participants (41.4% or 87) had no complaints, followed by those who complained of diarrhea or constipation or a mix 1-3 days every week (19.5%, 41) and 18.1% (38), respectively; few complained of diarrhea or constipation or a mix for 5-7 days every month and 3 days every month, 10.5% (22). The variations between participants were not significant ($p = 0.058$), as shown in Table 1.

The majority of participants had no improvement after defecation (53.8%, 113), compared with those who had improved after defecation (23.8%, 50). However, 22.4% (47) of the participants were unaware of this. The variations between variables are non-significant, $p = 0.066$. The majority of participants had no frequency of stool, 62.9% (132), compared with those who had a frequency of stool, 24.8% (52). Whereas few participants knew, 12.4% (26). The variations between participants were not significant ($p = 0.090$). There was no change in stool form for almost all participants (66.7%, 140), compared to those who had a change in stool form (24.8%, 52). Very few (8.6%) did not know the answer [18]. The difference between the variables was not significant ($p = 0.226$) (Table 2).

Completed defecation was reported by the majority of participants (52.9%, 111), compared to those who had always had incomplete defecation (24.8%, 52). However, a small number of participants (22.4%, 47) had incomplete defecation. The difference between the variables was not significant ($p = 0.401$) (Table 3).

Table 1: The times of complaints of diarrhea, constipation, or mixed symptoms were recorded.

Income	Frequency	Percent	$p = \text{value}$
1-3 days/week	41	19.5	0.058
5-7 days/month	22	10.5	
3 days/month	22	10.5	
Occasional	38	18.1	
None	87	41.4	
Total	210	100%	

Table 2: Participants were asked about improvements after defecation, frequency, and form of stool.

Income	Improved after defecation	Frequency of stool	Form of stool
Yes	23.8	24.8	24.8
No	53.8	62.9	66.7
N/A	22.4	12.4	8.6
$p = \text{value}$	0.066	0.090	0.226

Table 3: Incomplete defecation regarding subjects.

Income	Frequency	Percent	$p = \text{value}$
Always	52	24.8	0.401
No	111	52.9	
Sometimes	47	22.4	
Total	210	100.0	

The majority of participants (39.5%, 83) had no complaint about GIT motility, followed by those who complained of GIT motility occasionally (21.9%, 46) and 1-3 days every week (21.9%, 46 and (20.5%, 43), respectively. A small percentage of participants complained of GIT motility for 5-7 days every month and 3 days every month (9.5%, 20 and 8.6%, 18, respectively). The variations between the variables were not significant ($p = 0.203$), as shown in Table 4.

The participants were investigated regarding complaints of bloating. The majority of participants (36.2%; 76) sometimes had bloating, compared with those who did not (32.9%; 69). While 21.9% (46) had always had bloating, a few had occasional bloating (9%, 19). The difference between the variables was not significant ($p = 0.721$). Also, they were investigated many times for complaints about gas. The majority of participants, 36.2% (76), had gas sometimes, compared to those who didn't have gas, 34.3% (72). While 18.6% (39) had always had gas, 11% (23) had occasional gas. The difference between variables was not significant, $p = 0.678$. The majority of participants, 42.9% (90), had always experienced stress and anorexia, compared to those who sometimes did, 36.7% (77). Those who hadn't experienced stress and anorexia were 15.2% (32), and very few participants, 5.2% (11), had occasional stress and anorexia. The difference between variables was significant, $p = 0.011$, as shown in Table 5.

Table 6 shows how many times complaints were made about stress and anorexia. The majority of participants, 42.9% (90), had always experienced stress and anorexia, compared to those who sometimes experienced it, 36.7% (77). Those who hadn't experienced stress and anorexia were 15.2% (32), and very few participants, 5.2% (11), had occasional stress and anorexia. The difference between variables was significant, $p = 0.011$.

Table 4: How many times have you complained of GIT motility?

Income	Frequency	Percent	$p = \text{value}$
1-3 days/week	43	20.5	0.203
5-7 days/month	20	9.5	
3 days/month	18	8.6	
Occasional	46	21.9	
None	83	39.5	
Total	210	100.0	

Table 5: Investigation into complaints of bloating, gases, and anorexia.

Income	Bloating (%)	Gases (%)	Anorexia (%)
Always	21.9	18.6	42.9
Sometimes	36.2	36.2	36.7
Occasional	9.0	11.0	5.2
None	32.9	34.3	15.2
$P = \text{value}$	0.721	0.678	0.011*

Table 6: How many times complained of stress?

Income	Frequency	Percent	$p = \text{value}$
Always	90	42.9	0.011*
Sometimes	77	36.7	
Occasional	11	5.2	
None	32	15.2	
Total	210	100.0	

Table 7 shows the correlation between family history and bloating, GIT motility, frequency of stool, and health status of IBS patients. The results revealed a highly significant ($p \leq 0.05$) correlation between family history and the health status of IBS, and a highly significant ($p \leq 0.05$) correlation between bloating, GIT motility, and the health status of IBS patients. Whereas there is no significant ($p \geq 0.05$) correlation between family history and GIT motility and frequency of stool.

Table 8 shows the analysis of variance for body mass index, waist circumference, and neck circumference. The results revealed no significant difference ($p \geq 0.05$) in body mass index between participants, but there was a highly significant difference ($p < 0.05$) in neck circumference between participants and a highly significant difference ($p < 0.05$) in waist circumference between participants in this study.

Table 7: Correlation: Family history and bloating.

Parameters	Family history		bloating	
	Correlation	p = value	Correlation	p = value
GIT motility	0.074	0.285	0.283**	0.00
Frequency of stool	0.088	0.204	0.118	0.089
Health status of IBS	0.182**	0.008	0.200**	0.004

Table 8: ANOVA for BMI, Waist circumference, and Neck circumference.

Parameter	Minimum	Maximum	Mean		p value
	Statistic	Statistic	Statistic	Std. Error	
BMI	15.1	48.4	24.2267	0.34969	0.079
Waist C.	54	112	71.3429	0.70459	0.001
Neck C.	21	41	31.2286	0.16446	0.008

Discussion

The present study investigated the prevalence and clinical characteristics of irritable bowel syndrome (IBS) among female medical students at Misurata University using standardized criteria. The observed prevalence of approximately 25% demonstrates a substantial burden of functional gastrointestinal disorders within this cohort. This figure is consistent with epidemiological syntheses indicating that IBS disproportionately affects female populations and adolescents or young adults [1,4]. Large-scale multinational investigations, including the Rome Foundation Global Study, have demonstrated that while the strict application of Rome IV criteria often yields lower rates than earlier definitions due to stringent pain thresholds, regional and cohort-specific prevalence rates among university and healthcare trainees remain elevated worldwide [4,5]. In particular, systematic analyses focusing specifically on medical undergraduates have reported high vulnerability to IBS, driven by demanding academic training, clinical rotations, sleep deprivation, and psychological distress [8].

Bowel habit alterations were prominent among the participants, with 40.5% reporting recurring episodes of diarrhea, constipation, or alternating bowel function. In addition, 23.8% reported symptom improvement following defecation, alongside notable changes in stool frequency

(24.8%) and stool consistency (24.8%). These features align directly with the foundational diagnostic criteria for disorders of gut-brain interaction (DGBIs), where abdominal symptoms are fundamentally linked to aberrant defecatory patterns and bowel transit abnormalities [2,3]. Complaints of upper and lower gut dysmotility were also widespread, with 60.5% experiencing symptoms ranging from occasional to regular intervals. Bloating and excessive gas were reported by 67.1% and 65.7% of respondents, respectively. High rates of bloating and gaseous distension reflect postprandial gastrointestinal responses frequently reported in IBS populations, where visceral hypersensitivity and impaired gas clearance provoke substantial subjective distress [3,10,13].

Psychological comorbidity represented a major correlate of IBS in this study, with 42.9% and 36.7% of participants reporting continuous or frequent experiences of stress and anorexia, respectively, yielding a statistically significant association ($p = 0.011$). This strong interplay exemplifies modern concepts of the bidirectional gut-brain axis, in which heightened central stress responses trigger visceral hypersensitivity, dysregulate autonomic gut motility, and promote neuroendocrine shifts via the hypothalamic-pituitary-adrenal (HPA) axis [2,6]. Persistent psychological burden not only exacerbates gastrointestinal pain signaling but also frequently suppresses appetite, accounting for the co-occurrence of anorexia and gut discomfort observed in this student population [6, 12].

Evaluation of anthropometric markers revealed that while general body mass index (BMI) was not significantly differentiated, there were highly significant variations in both waist circumference ($p < 0.01$) and neck circumference ($p < 0.01$) among participants. These results support accumulating clinical evidence indicating that visceral adiposity and central fat distribution—rather than overall body mass—exert a stronger influence on gastrointestinal dysmotility and systemic microinflammation [10,11]. Central adiposity may heighten intra-abdominal pressure, promote visceral hypersensitivity, and alter neuroendocrine signaling pathways relevant to IBS pathophysiology [11]. Furthermore, the observed correlation between family history and health status in this sample reflects documented shared genetic predispositions and familial environmental factors, though familial clustering typically reflects overall disease liability rather than single symptom phenotypes.

A critical finding of this study is the pervasive deficit in knowledge regarding dietary strategies and symptom management, even among students enrolled in faculties of health sciences and medicine. Targeted dietary modifications, most notably the short-term restriction of fermentable oligosaccharides, disaccharides, monosaccharides, and polyols (the low-FODMAP approach), are widely recognized in international clinical practice guidelines as front-line therapies to reduce luminal distension, gas generation, and

visceral discomfort [3, 7]. The lack of awareness identified among these future healthcare providers highlights an essential curricular and practical gap, demonstrating that medical knowledge does not automatically translate into personal health literacy or evidence-based dietary self-management.

There is no significant difference in BMI between groups, but there are significant differences in neck and waist circumference. Literature on IBS and BMI is mixed, with some studies showing no clear association [14]. However, central adiposity (waist circumference) has been noted as more relevant to GI symptoms and metabolic comorbidities, which matches these findings.

Several limitations must be acknowledged. The study employed a cross-sectional design, which precludes establishing causal relationships between psychological distress, anthropometric changes, and IBS onset. Reliance on self-reported questionnaires also carries potential recall bias. Nevertheless, the findings illustrate the high burden of IBS among female Libyan medical students and underscore the urgent need for institutional support systems that integrate stress mitigation strategies and clinical nutrition education into academic curricula.

Conclusion

The current cross-sectional study revealed a high prevalence of Irritable Bowel Syndrome among female medical students at Misurata University, with approximately one in four students (25%) fulfilling the diagnostic criteria. The clinical presentation was primarily marked by alternating stool patterns, postprandial bloating, and gastrointestinal dysmotility, closely paralleled by high levels of academic-related stress and reduced appetite. Anthropometric evaluations underscored that central adiposity (waist circumference) and neck circumference, rather than generalized BMI, are significantly linked with symptom manifestations in this cohort. Despite their healthcare education, the marked deficit in students' understanding of evidence-based dietary interventions (such as low-FODMAP management) highlights an institutional gap between formal medical instruction and personal health behaviors. Implementing campus-based wellness initiatives that combine stress resilience training, nutritional counseling, and early clinical screening is warranted to alleviate functional gastrointestinal distress and safeguard the academic performance of future female healthcare providers.

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Data availability statement: Data sharing is not applicable, as no new data were generated or analyzed during this study.

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