

Prevalence, knowledge, attitude, and preventive behaviours of Saudi university students with symptomatic undiagnosed Irritable Bowel Syndrome

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Abstract

Objectives: This study aimed to investigate the prevalence, knowledge, attitude, and preventive behaviours towards symptomatic undiagnosed irritable bowel syndrome (IBS) in Saudi university students. In addition, this study also aimed to determine the factors that influence Saudi university students' practice of preventive behaviours against IBS symptoms.

Methods: A cross sectional observational study was carried out to assess the prevalence, knowledge, attitude, and preventive behaviours of a group of Saudi university students with symptomatic undiagnosed irritable bowel syndrome in Riyadh, Saudi Arabia from 2021 to 2022. The sample size included 384 Saudi university students of both genders aged 18-30 years old.

Results: Among 384 Saudi university students, the prevalence rate of IBS, according to the Rome IV criteria used in this study, was statistically significant with a percentage of (39.6%). 152 symptomatic undiagnosed IBS Saudi university students were identified, with the majority female with a percentage of (53.9%) (82) compared to (44.3%) (70) symptomatic male counterparts.

Conclusion: Irritable bowel syndrome is a prevalent, chronic gastrointestinal disorder, it affects patients' quality of life and has a significant adverse effect and impacts on work, lifestyle and social well-being. The prevalence among our targeted sample according to IBS Rome IV diagnostic criteria was (39.6%) 152. Therefore, screening of IBS is recommended.

Keywords: IBS, Saudi University students, Symptomatic patients, Undiagnosed, Stress.

Introduction

Irritable bowel syndrome (IBS) is a common disorder that affects the large intestine (colon) causing cramping and abdominal bloating. In addition it can change the pattern of movement in the intestinal cavity and can affect all ages. Symptoms are sometimes different among those infected and are classified as functional digestive disorders. Symptoms can be controlled with medication, diet and dealing with stress and anxiety. Lifestyle changes can also help to manage IBS symptoms (1).

IBS diagnosis should be clinical and symptom-based, due to the lack of specific diagnostic tests available. The exact pathological mechanism of IBS is still unknown, and there is no specific investigation for its identification. IBS is not usually easily diagnosed, this is due to the symptom's variations and uncertainties; it is mainly a diagnosis of exclusion. Functional gastrointestinal disorders including IBS are commonly diagnosed by the using the ROME-III criteria that have been widely used for the diagnosis of this type of disease. IBS symptoms are well known and have a significant negative impact which affects patients' quality of life. Uncontrolled IBS symptoms, as well as its chronic nature, commonly result in patients seeking constant medical care. Symptomatic undiagnosed patients who are unaware of having IBS, are known to initially self-treat with over-the-counter medications (2).

A cross sectional study discussed the prevalence of irritable bowel syndrome and metabolic syndrome among 1040 young adults in an annual health check-up. It was conducted between 2015 and 2017 in the executive annual check-up at the outpatient department of a multispecialty tertiary care hospital. It was aimed to examine the association between newly diagnosed metabolic syndrome and IBS. Among all the participants who were involved in the Rome III questionnaire for the diagnosis of IBS, out of 1040 patients, 29.5% were found to have metabolic syndrome while 3.2% had IBS. IBS and metabolic syndrome are disorders that are complex, multifactorial, deceptive in their presentation, and which have far-reaching consequences. The prevalence of IBS was low based on Rome III criteria, and there was no significant association between metabolic syndrome and IBS. On the contrary, a population-based study of 1096 participants in Japan using the Rome III questionnaire found that IBS was indeed positively associated with metabolic syndrome. Moreover, a case-control study from South Korea reported a significantly higher prevalence of metabolic syndrome in patients with IBS than those without IBS using the Rome III criteria (3).

IBS is a common functional gastrointestinal disorder which can have a significant negative impact on patients' quality of life affecting their work, social interaction, learning activities, student's academic performance and future career development. Symptoms of irritable bowel syndrome include intermittent complaints of abdominal pain and abnormal bowel movements, and these are common in the general population. Daily diaries show

that patients can be divided into the four distinct subtypes based upon different bowel patterns, namely IBS with diarrhea (IBS-D), IBS with constipation (IBS-C), IBS with mixed bowel pattern (IBS-M) (the most prevalent) and the rarely unclassifiable IBS (IBS-U). A research study discussed the impact of diet on the symptoms of irritable bowel syndrome and identified that reduced fibre intake is associated with an increased risk of constipation in the general population. A population-based survey in Norway reported that on average, IBS patients avoided 2.5 food items that triggered their symptoms, this included 35% who avoided milk, 14% cheese, 16% pulses, 24% onions, 10% wheat flour and 26% coffee. Wheat has consistently been identified as aggravating IBS symptoms. A recent survey in Australia reported that 14.9% of the general population reported wheat intolerance, however, only 1.2% had celiac disease, suggesting that 92% of those with wheat intolerance do not have celiac disease (4).

Another cross-sectional study conducted in Saudi Arabia with total of 173 medical students showed that IBS was significantly higher among students who experience emotional stress with a percentage of (25.4%) and was higher among students with a positive family history of IBS (5).

Methodology

This cross-sectional study was conducted between November 2021 and December 2022. 384 Saudi university students of both genders aged 18-30 years old were enrolled in the study. Prior to data collection, institutional review board approval was obtained from the Imam Muhammad bin Saud Research Ethics Committee in Riyadh City. We explained the study objectives to the participants and obtained their voluntary consent before enrolling them in the study. The data were collected via an online questionnaire distributed randomly through online platforms. Participants younger than 18 years or older than 30 years, non-Saudi individuals, and those diagnosed with IBS or those who did not provide informed consent were excluded. Participants were asked to complete a questionnaire that included demographic variables (eg, age, sex, marital status, education, and job). The participants also answered questions about their physical health, comorbidities, and past medical history.

The diagnosis and severity assessment of IBS was based on the Rome IV diagnostic questionnaire, a well-developed validated tool to assess IBS. This questionnaire is a reliable tool for diagnosing IBS based on the presence of abdominal pain or discomfort that occurred at least once a week for at least 3 months in the past 6 months, in combination with two or more incidents of pain or discomfort with defecation, change in stool frequency or appearance. Statistical analysis was done using a statistical package for social sciences (SPSS). We used the Chi-square test to attain a p-value between categorical dependent and independent data to estimate the association where $p \leq 0.05$ is considered significant.

Ethics and human subjects' protection:

The confidentiality of the data of the participants was maintained. Names and other identifying information was anonymous, and an informed consent was provided by participants before they completed the questionnaire. Ensuring privacy and the adequate level of confidentiality implies that the information is strictly used for research purposes only. The questionnaire contained an introduction explaining the purpose of the study, and required the participants' permission to use their responses in our study.

Results

In this study, data was collected from 384 participants. Female gender represented the majority of the sample with a percentage of 55.7% (214) compared to 44.3% (170) male. Most of the participants were aged between 18-30 years old. Results of the study revealed that the participants were in different academic years and the majority were fourth year university students. Around 43.8% of the participants were medical students. With respect to the academic year, 6.5%, 12.8%, 13%, 19%, 20.8%, and 18.2% of the students were in the preparatory, first, second, third, fourth, and fifth academic year, respectively. Most of the participants were single, with a percentage of 95.1%. A Grade point average (GPA) was reported for 48.4% (186) of the participants and the majority of our targeted sample had a GPA of 3.5-4.49 out of 5.0. More details are presented in Table 1.

Regarding the symptoms, abdominal pain was the most reported symptom in our study population with a percentage of 50.5%, followed by 41.7% with constipation and 27.3% with diarrhoea. However, 33.1% of the sample showed no symptoms.

Regarding the methods used to relieve their IBS symptoms, results of the present study showed that university students take regular medication, adhere to a specific diet, and try to reduce stress in order not to aggravate the condition. Table 2 contains more details.

When comparing the results among symptomatic undiagnosed Saudi university students and those with no symptoms, the prevalence of symptomatic undiagnosed IBS according to IBS Rome IV diagnostic criteria is 39.6% (152) among our targeted sample. Females represented the majority with a percentage of 53.9% (82) symptomatic prevalence compared to 44.3% (70) symptomatic males (p value = 0.569). Table 3 presents more details according to the Rome IV diagnostic criteria questionnaire.

Table 1: Demographic and clinical characteristics

| | | Count (n) | Percent (%) |
|-----------------------|------------------|-----------|-------------|
| Age (years) | Less than 18 | 4 | 1% |
| | 18-30 | 370 | 96.4% |
| | 31-40 | 3 | 0.8% |
| | More than 40 | 7 | 1.8% |
| Sex | Male | 170 | 44.3% |
| | Female | 214 | 55.7% |
| Nationality | Saudi | 375 | 97.7% |
| | Non-Saudi | 9 | 2.3% |
| Marital status | Married | 19 | 4.97% |
| | Not married | 365 | 95.1% |
| Occupation | Student | 347 | 90.4% |
| | Employee | 28 | 7.3% |
| | Not employee | 9 | 2.3% |
| Academic year | Preparatory year | 25 | 6.5% |
| | First year | 49 | 12.8% |
| | Second year | 50 | 13% |
| | Third year | 73 | 19% |
| | Fourth year | 80 | 20.8% |
| | Fifth year | 70 | 18.2% |
| | Graduate | 37 | 9.6% |
| | Medical Student | 168 | 43.8% |
| GPA out of 5 | 2.49 or less | 8 | 2.1% |
| | 2.50 to 3.49 | 41 | 10.7% |
| | 3.50 to 4.49 | 186 | 48.4% |
| | 4.50 or more | 149 | 38.8% |

Table 1: Demographic and clinical characteristics (continued)

| | | | |
|---|---------------------------------|-----|-------|
| Weight (kg) | 40-50 | 48 | 12.5% |
| | 51-60 | 77 | 20.1% |
| | 61-70 | 83 | 21.6% |
| | 71-80 | 112 | 29.2% |
| | 81-90 | 44 | 11.5% |
| | 90 or more | 20 | 5.2% |
| Height (cm) | 140 or less | 1 | 0.3% |
| | 141-150 | 6 | 1.6% |
| | 151-160 | 110 | 28.6% |
| | 161-170 | 139 | 36.2% |
| | 171-180 | 122 | 31.8% |
| | 180 or more | 6 | 1.6% |
| Sleeping hours per day | Less than 8 hours | 159 | 41.4% |
| | 8 hours or more | 225 | 58.6% |
| | Smoking | 37 | 9.6% |
| | History of abdominal surgery | 10 | 2.6% |
| Type of surgery | Gastric sleeve | 5 | 50% |
| | Appendectomy | 1 | 10% |
| | Hernia repair | 3 | 30% |
| | Resection and re-anastomosis | 1 | 10% |
| History of gastrointestinal diseases | Irritable bowel syndrome | 57 | 14.8% |
| | Peptic ulcer disease | 6 | 1.6% |
| | Gastroesophageal reflux disease | 29 | 7.6% |
| | Enteritis | 6 | 1.6% |
| | Nothing | 308 | 80.2% |

Table 2: Symptoms and methods to relieve them

| | | Count (n) | Percent (%) |
|---------------------------------|---------------------------|-----------|-------------|
| Symptoms | Constipation | 160 | 41.7% |
| | Abdominal pain | 194 | 50.5% |
| | Diarrhea | 105 | 27.3% |
| | Vomiting | 49 | 12.8% |
| | Rectal bleeding | 16 | 4.2% |
| | Unintentional weight loss | 30 | 7.8% |
| | No symptoms | 127 | 33.1% |
| Methods to relieve IBS symptoms | Stress reduction | 101 | 26.3% |
| | Diet | 82 | 21.4% |
| | Exercise | 52 | 13.5% |
| | Medication | 90 | 23.4% |
| | Nothing | 224 | 58.3% |
| IBS Rome IV diagnostic criteria | Positive | 152 | 39.6% |
| | Negative | 232 | 60.4% |

Table 3: Comparison regarding the presence of IBS symptoms with ROME IV diagnostic criteria

| | | Positive n (%) | Negative n (%) | P Value* |
|---|--|----------------|----------------|----------|
| Sex | Male | 70 (46.1%) | 100 (43.1%) | 0.569 |
| | Female | 82 (53.9%) | 132 (56.9%) | |
| Abdominal pain in the past 3 months | Never | 5 (3.3%) | 111 (47.8%) | 0.000 |
| | One day a month | 14 (9.2%) | 39 (16.8%) | |
| | Two to three days a month | 29 (19.1%) | 40 (17.2%) | |
| | Once a week | 20 (13.2%) | 15 (6.5%) | |
| | Two to three days a week | 28 (18.4%) | 11 (4.7%) | |
| | Most days | 40 (26.3%) | 9 (3.9%) | |
| | Every day | 14 (9.2%) | 6 (2.6%) | |
| | Multiple times per day or all the time | 2 (1.3%) | 1 (0.4%) | |
| Percentage of abdominal pain with bowel change | 0% Never | 10 (6.6%) | 135 (58.8%) | 0.000 |
| | 10% - 30% | 30 (19.7%) | 53 (22.8%) | |
| | 40% - 60% | 66 (43.4%) | 33 (14.2%) | |
| | 70% - 90% | 41 (27%) | 9 (3.9%) | |
| | 100% Always | 5 (3.3%) | 2 (0.9%) | |
| Percentage of abdominal pain with stool change either softer or harder than usual | 0% Never | 10 (6.6%) | 137 (59.1%) | 0.000 |
| | 10% - 30% | 19 (12.5%) | 42 (18.1%) | |
| | 40% - 60% | 51 (33.6%) | 33 (14.2%) | |
| | 70% - 90% | 60 (39.5%) | 17 (7.3%) | |
| | 100% Always | 12 (7.9%) | 3 (1.3%) | |
| Percentage of abdominal pain with a need to defecate more or less than usual | 0% Never | 10 (6.6%) | 128 (55.2%) | 0.000 |
| | 10% - 30% | 19 (12.5%) | 49 (21.1%) | |
| | 40% - 60% | 46 (30.3%) | 34 (14.7%) | |
| | 70% - 90% | 60 (39.5%) | 19 (8.2%) | |
| | 100% Always | 17 (11.2%) | 2 (0.9%) | |

Table 3: Comparison regarding the presence of IBS symptoms with ROME IV diagnostic criteria (continued)

| | | | | |
|---|---------------------------|------------|-------------|-------|
| Symptom duration 6 months or more | Yes | 117 (77%) | 54 (23.3%) | 0.000 |
| | No | 35 (23%) | 178 (76.7%) | |
| Type of abnormal stool in past 3 months | Diarrhea | 33 (21.7%) | 18 (7.8%) | 0.000 |
| | Constipation | 66 (43.4%) | 32 (13.8%) | |
| | Diarrhea and constipation | 53 (34.9%) | 21 (9.1%) | |

*Chi square test

Discussion

This study investigates IBS prevalence, knowledge, attitude and preventive behaviours among Saudi university students with symptomatic undiagnosed irritable bowel syndrome. The results show a high prevalence of IBS in the study population. The prevalence rate of IBS according to Rome IV criteria in this study was statistically significant with the percentage of 39.6% (152) among symptomatic undiagnosed IBS Saudi university students. Females represented the majority with a percentage of 53.9% (82) who were symptomatic and showed a higher prevalence compared to 44.3% (70) symptomatic males. A previous study by Alsuwailm et al.(5) in Saudi Arabia showed that the prevalence of IBS among medical students was 44.5%. Another study was also carried out in Saudi Arabia by Alzahrani et al.(6) which estimated that the prevalence of IBS among medical students was around 17.5%. Similarly, a study carried out by Alaqeel et al.(7) revealed that the overall prevalence of IBS in Saudi Arabia was 21%. However, globally, the prevalence of IBS in different countries among medical students varies; the percentages from Africa, Japan, Korea, Pakistan, Canada, and China were 43.5%, 35.5%, 29.2%, 28.3%, 19.1%, 9.3%, respectively (8). Several investigations were conducted to evaluate the relationship between gender and increased IBS prevalence. According to research by Elhosseiny et al (9), the male percentage was higher at 67%. Another similar study revealed a male predominance with a percentage of 18.6% (8). Nevertheless, a study carried out by Alzahrani et al(6) revealed that females were associated with IBS more than males, with a percentage of 19.6%. Various research studies have shown that IBS is associated with educational level, with senior year students having a higher incidence of IBS. A study carried out by Elhosseiny et al (9), showed that most IBS patients were senior-year students, with a prevalence of 43.3%. Another study carried out by Alsuwailm et al (5), estimated that 11% of IBS patients were from the 6th year while 7% were from the 5th year. However, our investigations revealed that the majority of IBS were 4th-year Saudi University students with a percentage of 21.1%. While several papers attempted to relate IBS to increased BMI, research carried out by Alsuwailm et al (5) showed that most students with IBS had a BMI within the

normal range of 28.3%. According to the Elhosseiny et al (9) study, it was found that the majority of IBS students had a normal BMI of 62.4%. This agrees with the result of this study as most of the symptomatic undiagnosed IBS Saudi University students have a BMI within the normal range of 34.9%.

In Saudi Arabia, a study conducted in Riyadh estimated the prevalence of IBS among all academic year students from both genders, at the Imam Mohammad Ibn Saud Islamic University (IMSIU) to be 12.6% as their responses were consistent with a diagnosis of IBS (10). Another similar study conducted in Taiwan estimated the prevalence of IBS among female university students with a percentage of 10.1%(11). A cross-sectional study was carried out among medical students and interns in Jeddah, Saudi Arabia, measuring the prevalence of IBS to be 31.8% (12). Another similar localised study, estimated the prevalence of IBS and its association with anxiety among medical students at King Saud bin Abdulaziz University for Health Sciences in Riyadh to be 21% (n=57)(8). Similarly, this study supports these findings. Our results indicated that students in the College of Medicine had a higher risk of IBS compared to those in other colleges. Highly diverse findings regarding the prevalence of IBS have been obtained in different studies. The variations in the rate of the prevalence of IBS might be due to differing diagnostic criteria, lack of knowledge about IBS and the geographical area.

With respect to the academic year, the current study demonstrated that IBS was most prevalent among final year university students, followed by third year university students. These high rates could be correlated with an increasing workload and anxiety. Many studies also demonstrated that there was a statistical significance between the prevalence of IBS among university students and anxiety; this indicates that university students with IBS symptoms have significantly greater stress compared with those without IBS. Those patients tend to experience anxiety due to abdominal discomfort and abnormal bowel movements, which could affect their work, social interaction, learning activities, and quality of life. Therefore, IBS may influence students' academic performance and future career development.

Regarding preventive habits, the results of the present study showed that university students take regular medication, adhere to a specific diet and try to reduce stress to prevent exaggerating their IBS symptoms. Similar results were also reported from many other studies¹⁵.

Conclusion

Irritable bowel syndrome is a prevalent, chronic gastrointestinal disorder which affects patients' quality of life and has significant adverse effects which impact on work, lifestyle and social well-being. The prevalence among our targeted sample of symptomatic undiagnosed IBS according to IBS Rome IV diagnostic criteria was 39.6%. Therefore, screening of IBS is recommended. Future studies need to perform more focused evaluation to identify the underlying etiology of IBS, and how to reduce its incidence if applicable.

List of Abbreviations

IBS: Irritable bowel syndrome

IMSUI: Imam Mohammad Ibn Saud Islamic University

BMI: Body mass index

Conflict of interest

The authors declare that there is no conflict of interest regarding the publication of this article.

Consent for publication

Informed consent was obtained from all individual participants included in the study.

Ethical approval

Ethical approval was granted by the Institutional Review Board via reference number: 181-2022, dated:15/02/2022.

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