

The prevalence of IBS among UQU students in Makkah, KSA

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ABSTRACT

Background: Irritable Bowel Syndrome (IBS) is a common gastrointestinal disorder that affects people of all ages worldwide. IBS can be influenced by stressful factors such as psychiatric illness or environmental factors. **Aim:** To determine IBS prevalence among Umm Al-Qura University students, Makkah, Saudi Arabia. **Method:** In 18 UQU colleges, a cross-sectional study was conducted on undergraduate students. An online self-administered questionnaire was used to diagnose IBS by using the Rome III criteria. The data collection process started in September 2021 to January 2022. **Result:** The prevalence of IBS among UQU students was (20.30%) according to the Rome III criteria. 43.2% of students had IBS family history, 28.3% had previously been diagnosed with IBS and 8.2% had chronic illnesses other than IBS. Of them, 53.9% had emotional stress, 81% had educational stress and 84.2% had psychological stress (Anxiety). More than 60% (64%) had sleeping disorders, 14.8% were smokers and 45% were having fatty meal >3 times per week. Of them, 43.1% were having vegetarian meal >3 times per week and 58.4% were not exercising at all. Female students, those in >7 academic year, those having IBS family history, who had previously been diagnosed with IBS, who had emotional or educational stress, psychological stress or sleeping disorders all had a significantly higher prevalence of IBS. **Conclusion:** Irritable bowel syndrome was found in 20.30% of students in Makkah, Saudi Arabia. Enhancing the quality of academic and psychological counseling services may reduce IBS risk factors among students.

Keywords: Prevalence, IBS, UQU, Medical, Students, KSA.

1. INTRODUCTION

Irritable Bowel Syndrome is a common gastrointestinal disorder characterized by abdominal pain, diarrhea and alternate bowel habits in the absence of organ damage caused by tumor or inflammation (Bellini et al., 2014; Saha, 2014). IBS can be influenced by some factors as psychiatric illness and environmental factors that lead to stress (Qin et al., 2014). These factors are the most common causes of IBS symptoms in the community (Qin et al., 2014). IBS affects as many as 5%-20% of individuals worldwide (El-Salhy, 2012). Significant proportions (35% to 40%) of individuals who report IBS in the community are males and approximately 60% to 65% were females. IBS is

a common chronic bowel disorder which cause negative effects on the health therapy reducing the quality of life and resulting in high healthcare costs (Agarwal and Spiegel, 2011).

Children and the elderly can be affected, but patients under the age of 50 are more likely to have it diagnosed (El-Salhy, 2012). Gastroenterologists are the doctors most likely to identify IBS as a disorder, accounting for up to 12% of all visits to primary care doctors (Agarwal and Spiegel, 2011). IBS symptoms include abdominal pain or discomfort, abdominal distension and either diarrhea, constipation or a combination of the two (El-Salhy, 2012). Although its cause is unknown, some pathogeneses have been connected to IBS. Intestinal inflammation, changes in gastrointestinal motility, changes in gut microbiota, changes in food sensitivity, dietary intakes, visceral hypersensitivity, post-infectious reactivity and other factors are examples (Occhipinti and Smith, 2012).

IBS is diagnosed using the Manning criteria, Rome I, II and III, among other criteria. Since they can detect IBS even in the absence of any warning signs, the final criteria are the ones that are most frequently used. IBS is described as having two or more symptoms and three days per month of recurrent abdominal pain or discomfort for the previous three months. These traits include, but are not limited to, symptom relief with defecation, onset linked to a change in bowel frequency and/or onset linked to a change in bowel appearance (Dong et al., 2010; Naeem et al., 2012; Shen et al., 2009). When combined with the absence of red flag symptoms, the Rome criteria has a sensitivity of 65% and a specificity of 100% (Saito et al., 2002). In addition, the positive predictive value is 100% and the negative predictive value is 76% (Saito et al., 2002). In different patients, the symptoms range from tolerable to severe and the time pattern and level of discomfort varies greatly (El-Salhy, 2012).

IBS has been the subject of numerous studies in the Middle East, many of which have shown that the condition is more common in medical students. Irritable bowel syndrome prevalence and its effects on quality of life were studied in the Suez governorate of Egypt (Abdulmajeed et al., 2011; Darweesh et al., 2015; Mansour-Ghanaei et al., 2009; Roshandel et al., 2006). Because of the emotional and psychological stress caused by prolonged study, frequent exams, disrupted eating and sleeping patterns, unfavorable living conditions and a sense of responsibility for patients, studies on the prevalence of IBS in medical students tend to focus on this population (Jung et al., 2011). A study of medical interns and students at King Abdulaziz University in Saudi Arabia used the Rome III Criteria and the Standardised Hospital Anxiety and Depression Scale. According to the study, IBS was prevalent in 31.8% of people and those with higher levels of education, women, morbid anxiety, living in school dormitories, experiencing emotional stress and being alone were more likely to have it.

Researchers conducted a different study at the Northern Border University in Saudi Arabia with both medical and non-medical students. The Rome III criteria were used. IBS was significantly more prevalent in people who were stressed out and had a high body mass index, with females having a disease prevalence of 33.6%. The study's findings showed that neither socio-demographic factors nor smoking were significantly associated with IBS (El-Fetoh et al., 2016). In the present study, medical and non-medical students were at the University of Qadisiya in Makkah, Saudi Arabia were studied to investigate IBS prevalence and its risk factors.

2. METHOD

Study design

This study was a cross sectional study

Study setting and time

The study was conducted in 18 of UQU colleges including (medicine College, Dental College, Pharmacy College, Nursing College, College of Applied Medical Sciences, College of public Health and Health Informatics, College of Business Administration, Social Sciences College, Community College, Arabic language College, Educational College, Applied Sciences College, College of Computer and Information System, Islamic Studies College, Fundamental of Religion College, Community Services College, Judicial Studies and Regulations College, College of Economic Sciences and Islamic Finance). The study was done in the time from September to November 2022.

Sample size

IBS prevalence in Saudi Arabia ranged from 8.9% to 40.7%, according to several cross-sectional studies (Hadi-Alharbi, 2018). The calculation of the sample was done with a 5% margin of error and a 95% confidence interval. The minimum calculated sample was 600 participants after addition of 15% to avoid lost or incomplete questionnaires.

Study participants

The inclusion criteria were all undergraduate students in UQU. And the exclusion criteria were students who are diagnosed with organic abdominal diseases like IBD, chronic gastritis, Intestinal diseases (ulcerative colitis, Crohn' disease), diseases with multiple medications (antidepressants, cancer, liver and kidney diseases) and recent parasitic infection less than 6 months.

Study tool

A pre-designed questionnaire was used to collect data that included 3 sections. The 1st included items about socio-demographic data (age-gender-marital status-educational level). The 2nd included items about potential risk factors (stress, anxiety, sleep disorder, dietary habits) 3a-Diagnosis: Based on Rome 3 criteria. Also, these questions were added: 1) Have you had persistent abdominal pain or discomfort in the previous three months or twelve weeks? 2) How many days a month do you feel that discomfort or pain? 3) Does urinating make the pain go away? 4) The onset of persistent abdominal pain or discomfort that started at least three months ago and started at least six months earlier, with at least two of the following factors being present. Improvement with defecation, onset connected to a change in frequency of stool, onset connected to a change in stool form (appearance) and/or improvement with defecation (Drossman, 2006). The discomfort is a disagreeable feeling that is not pain.

Ethical considerations

The study received ethical approval from UQU's research ethics committee in Makkah, Saudi Arabia.

Data analysis

SPSS version 26 was used to analyze the data. Numbers and percentages were used to represent qualitative data and Chi-squared test (χ^2) was used to assess the relationship between variables. Quantitative data was expressed as mean and standard deviation (Mean \pm SD), where Mann-Whitney tests was applied for non-parametric variables. A p-value of <0.05 was considered as statistically significant.

3. RESULTS

Figure 1 shows that 126 students were identified as having IBS, with a corresponding prevalence of 20.3%. Based on the Rome III criteria. Table 1 show a total of 622 undergraduate students participated in the survey. Female students represented (63.3%) and male students represented (36.7%), 97.1% were Saudi students, 35% were enrolled medical colleges, 91.6% were married and 1.3% had children. Of them, 65% were medical field students, 50% were in 4-7 academic years and the mean GPA 3.15 ± 1.04 . Female students ($p=0.021$) and those in >7 academic years had a significant higher prevalence of IBS ($p=0.007$). A non-significant difference was found according to students' nationality, marital status, having children, study field and GPA ($p>0.05$).

In Table 2, 43.2% of students had IBS family history, 28.3% had already received an IBS diagnosis and 8.2% had chronic conditions other than IBS. Of them, 53.9% had emotional stress, 81% had educational stress and 84.2% had psychological stress (Anxiety). More than 60% (64%) had sleeping disorders, 14.8% were smokers and 45% were having fatty meal >3 times per week. Of them, 43.1% were having vegetarian meal >3 times per week and 58.4% were not exercising at all.

It was discovered that IBS prevalence was significantly higher in students who had a family history, who had previously been diagnosed with it or who had emotional stress, educational stress, psychological stress (anxiety) or sleeping disorders ($p<0.05$). On the other hand, a non-significant relationship was found according to having chronic illnesses except IBS, smoking, frequency of intake of fatty or vegetarian meal per week or exercising ($p>0.05$).

Table 1 Relationship between IBS prevalence and participants' demographics, having children, academic field and year and GPA

Characteristics		Total n (622)		IBS n (126)		No IBS n (496)		P value
		Number	Percentage	Number	Percentage	Number	Percentage	
Gender	Males	228	36.70%	35	15.40%	193	84.60%	0.021
	Females	394	63.30%	91	23.10%	303	76.90%	
Nationality	Saudi	604	97.10%	125	20.70%	479	79.30%	0.115
	Non-Saudi	18	2.90%	1	5.60%	17	94.40%	
Marital Status	Single	570	91.60%	113	19.80%	457	80.20%	0.426
	Married	44	7.10%	12	27.30%	32	72.70%	
	Divorced or widow	8	1.30%	1	12.50%	7	87.50%	

Have children	Not married	554	89.10%	108	19.50%	446	80.50%	0.169
	Not have children	42	6.80%	9	21.40%	33	78.60%	
	Have children	8	1.30%	9	34.60%	17	65.40%	
Study field	Medical	218	35%	42	19.30%	176	80.70%	0.651
	Non medical	404	65%	84	20.80%	320	79.20%	
Study year	1 to 3	300	48.20%	45	15.00%	255	85.00%	0.007
	4 to 7	311	50.00%	78	25.10%	233	74.90%	
	>7	11	1.80%	3	27.30%	8	72.70%	
GPA	Mean ± SD	3.15 ± 1.04		3.07 ± 1.09		3.16 ± 1.04		0.229

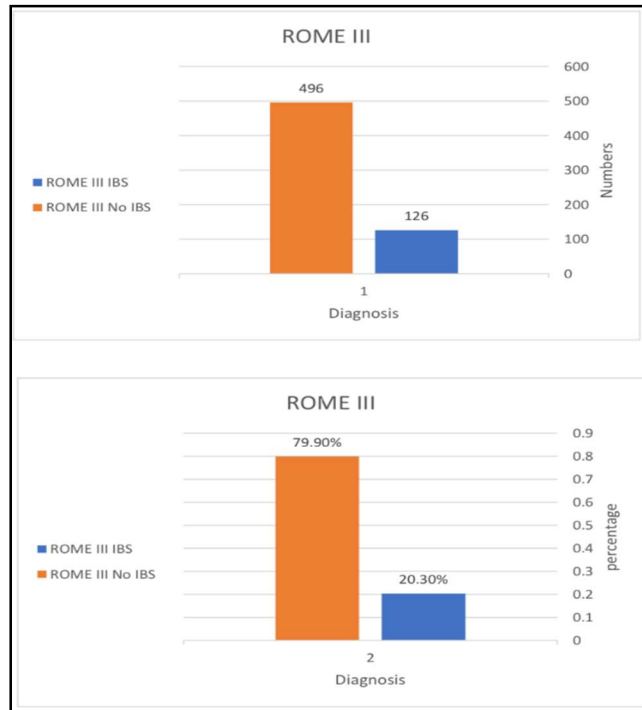


Figure 1 Percentage distribution of the participants accordions to the prevalence of IBS

Table 2 Relationship between IBS prevalence and potential risk factors of IBS

Characteristics		Total n (622)		IBS n (126)		No IBS n (496)		P value
		Number	Percentage	Number	Percentage	Number	Percentage	
Having IBS family history	Yes	269	43.20%	74	27.50%	195	72.50%	<0.001
	No	353	56.80%	52	14.70%	301	85.30%	
Have you been diagnosed with IBS before?	Yes	176	28.30%	65	36.90%	111	63.10%	<0.001
	No	446	71.70%	61	13.70%	385	86.30%	
Any chronic illnesses except IBS (E.g.: DM, HTN...etc.) diagnosed before?	Yes	51	8.20%	10	19.60%	41	80.40%	0.904
	No	571	91.80%	116	20.30%	455	79.70%	
Any emotional stress?	Yes	335	53.90%	90	26.90%	245	73.10%	<0.001
	No	287	46.10%	36	12.50%	251	87.50%	
Any educational stress?	Yes	504	81.00%	114	22.60%	390	77.40%	0.002
	No	118	19.00%	12	10.20%	106	89.80%	
Any psychological stress (Anxiety)?	Yes	524	84.20%	119	22.70%	405	77.30%	<0.001
	No	98	15.80%	7	7.10%	91	92.90%	
Any sleeping disorders?	Yes	398	64.00%	94	23.60%	304	76.40%	0.005

	No	224	36.00%	32	14.30%	192	85.70%	
Smoker?	Yes	92	14.80%	19	20.70%	73	79.30%	0.919
	No	530	85.20%	107	20.20%	423	79.80%	
Fatty meal/week?	None	27	4.30%	3	11.10%	24	88.90%	0.438
	< 3 per week	315	50.60%	63	20.00%	252	80.00%	
	>3 per week	280	45%	60	21.40%	220	78.60%	
Vegetarian meal/week?	None	72	11.60%	11	15.30%	61	84.70%	0.523
	< 3 per week	282	45.30%	60	21.30%	222	78.70%	
	>3 per week	268	43.10%	55	20.50%	213	79.50%	
Exercise Type	None	363	58.40%	68	18.70%	295	81.30%	0.491
	Walking	75	12.10%	18	24.00%	57	76.00%	
	Others	184	29.60%	40	21.70%	144	78.30%	

4. DISCUSSION

We are aware of no other university-based research that looks at the prevalence of IBS among UQU students. Twenty-three percent of undergraduate students were found to have IBS. Medical college students made up 19.3% of the student population, while non-medical students made up 20.8%. We found that 15.6% of Jeddah's medical students met the Rome III criteria for IBS by comparing our results to those of other regional studies (Hasosah et al., 2017). Similar to our current study, another study conducted on health sciences students at King Saud bin Abdulaziz University in Riyadh discovered a prevalence of 21.1% (Alaqeel et al., 2017). These comparable results could be explained by the similar living and study conditions among this age group (18 to 30 years old) across Saudi Arabia (Al-Butaysh et al., 2020). On the other hand, a study done in the Arar region of Saudi Arabia, on Northern Border University students found that a prevalence of IBS of 32.5% (El-Fetoh et al., 2016), which is higher than the current study. Globally, a study conducted in Canada reported that medical students with overnight shifts had an IBS prevalence of (20.5%) (Wells et al., 2012), while a study conducted in Pakistan (28.3%) (Naeem et al., 2012), which was higher than the prevalence reported in the current study.

Our findings indicated that female students had a higher prevalence of IBS. The same finding was revealed in a study done in Al-Majmaah University, in Saudi Arabia (Aldawsari et al., 2017). A possible explanation for this might be hormonal, prior studies have supported that there is a significant role of sex hormones on IBS (Aldawsari et al., 2017; Kim and Kim, 2018; Meleine and Matricon, 2014). Modulation and the brain areas engaged by the same visceral stimuli vary by sex. Women with IBS show higher activation of brain areas involved in emotional pain processing (the limbic system) rather than the visceral cortex (e.g., insula), which is engaged in men in response to rectal stimulation (Kim and Kim, 2018; Meleine and Matricon, 2014). In a previous experimental study, pain modulation was enhanced by estrogen, while testosterone had analgesic effects (Kim and Kim, 2018). Both estrogen and progesterone boosted activity of the hypothalamic-pituitary-adrenal axis, with increases in circulation levels of corticotropin-releasing hormone and cortisol. In contrast, testosterone reduced stress-related Adrenocorticotrophic hormone (ACTH) release (Kim and Kim, 2018). Also, it was demonstrated that in comparison to men, women have more clinical pain, lower pain thresholds and tolerance and higher sensitivity and discomfort to pain (Kim and Kim, 2018).

The result of this study showed students in >7 academic years had a significant higher prevalence of IBS. This could be explained by the increase in anxiety and stress before graduation (Alaqeel et al., 2017). The same result was revealed from a study conducted in Riyadh, Saudi Arabia, where second-year students had the second-highest prevalence of IBS after final-year students (Alaqeel et al., 2017). The high rates among higher academic years were explained by the increased workload (Alaqeel et al., 2017). The current study discovered no association between IBS prevalence and student GPA, study field, marital status, parental status, or nationality. An earlier study with medical students at Prince Sattam bin Abdulaziz University in Saudi Arabia found no evidence that IBS was significantly related to academic performance (Han et al., 2006). Different results were observed in previous studies, where married students had a higher prevalence (Alqahtani and Mahfouz, 2022). This was explained by difficulties balancing married life and education in comparison with single, widowed or divorced students (Han et al., 2006).

In terms of the GPA of the students, our results were different from those of a study carried out among medical students at King Abdulaziz University in Jeddah (Ibrahim et al., 2013). Additionally, it was noted that the rates of IBS were marginally higher among students with higher GPAs. In this study, the prevalence of IBS was noticeably higher among students who had a family history of the condition. This is in line with the findings of an earlier study, which found that the most prevalent risk factor for IBS patients was family history (Alqahtani and Mahfouz, 2022).

Mayer, (2000), Naliboff et al., (2000) and Taché et al., (1999) demonstrate that stress plays a significant role in the development of IBS symptoms. In our study, we discovered that students with emotional, educational, psychological stress (like anxiety) or sleeping disorders had significantly higher rates of IBS. In a study on medical students at a public university in Mexico, it was discovered that IBS and time constraints were related to one another (Pozos-Radillo et al., 2018). Additionally, Seger et al., (2020) discovered an association between IBS and anxiety and depression among Malaysian medical students. The association between IBS prevalence and sleeping disorders in the current research was also observed in a study by Okami et al., (2011), who found that less sleeping time and more sleep disorders were associated with IBS.

5. CONCLUSION

This study found that there was a 20.30% prevalence of IBS among UQU students in Makkah, Saudi Arabia. The association between some characteristic and Socio-demographic of participants and IBS was noticed in this study, such as gender, academic year, family history of IBS, stress and sleeping disorders and psychological state. In contrast, there was no connection between IBS and certain food groups, exercise or smoking. To lessen anxiety, stress and other IBS risk factors, it is advised to increase the caliber of academic counselling and offer psychological counselling services to students.

Abbreviations

UQU-Umm Al-Qura University

KSA-Kingdom of Saudi Arabia

IBS-Irritable Bowel Syndrome

IBD-Irritable Bowel Disease

χ^2 -Chi- squared test

Acknowledgments

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Author Contributions

Ruba F Mohammed, Elaf Saleh Heji, Omniyh Fatani, Lina I Kinkar, Nada Mohammad Allhaiby, Asia M Kalantan and Reda Goweda: All shared in designing the study, developing the questionnaire and the informed consent, writing the protocol and planning the study, carried out data collection, entry, statistical design and analysis.

Informed consent

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

Ethical approval

Ethical approval was obtained from The Biomedical Research Ethics Committees at UQU, Makkah, Saudi Arabia (Number: YWWX191220) on Dec 27, 2020.

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Conflict of interest

The authors declare that there is no conflict of interests.

Data and materials availability

All data sets collected during this study are available upon reasonable request from the corresponding author.

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