

Irritable Bowel Syndrome among Medical and Non-Medical Northern Border University Students, Kingdom of Saudi Arabia: Across Sectional Study

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Abstract

Background: Irritable Bowel Syndrome (IBS) is a common functional gastrointestinal disorder (FGID), characterized by abdominal pain or discomfort and alteration in bowel habits. **Aim of the study:** To determine the overall prevalence, prevalence of each type and risk factors of IBS among Northern Border University (NBU) students, Arar, Kingdom of Saudi Arabia. **Material and methods:** We use cross sectional, descriptive study with multistage cluster probability sample. Using Rome III criteria questionnaire of IBS; which is a self-administrated consists of ten questions assessing the current status of an apparently normal person. The questionnaire is administrated to Northern Border University students. **Results:** A total of 228 University students of them, 94 (41.2%) males and 134 (58.8%) females were included in the study. The overall prevalence of IBS according to Rome III criteria in northern border University was (32.5%). The disease prevalence was 33.6% in females and 30.9% in males. Among the study participants, the most common type of IBS was the mixed one 12.7%, followed by the constipation predominant type 10.5%, then the diarrhea predominant type 5.7% while the least common was un-subtyped cases (3.5%). Statistically significant increase in prevalence of this disease was found among female students (60.8% vs. 39.2% in males) (p-value < 0.05), the students who experienced psychic stress and irritability (79.7%) (p-value < 0.05) and students who were obese (p-value < 0.001). **Conclusion:** The results

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of this study concluded the prevalence rate of 32.5% for IBS among the students studying in Northern Border University. Stress and high body mass index were significantly associated with IBS. In addition, this study concluded that IBS was not significantly associated with socio-demographic characteristics and smoking.

Keywords

Prevalence, Irritable Bowel Syndrome, IBS, Rome III Criteria

1. Introduction

Irritable Bowel Syndrome (IBS) is a common functional gastrointestinal disorder (FGID), characterized by abdominal pain or discomfort and alteration in bowel habits [1].

Altered gastrointestinal motility, visceral hypersensitivity, post-infectious reactivity, brain-gut interactions, alteration in gut microbiota, food sensitivity, dietary intakes, and intestinal inflammation have been linked to the pathogenesis of IBS [2].

IBS affects as many as 5% - 20% of individuals worldwide. It is more prevalent in women than men, and is more commonly diagnosed in patients younger than 50 years of age [3].

IBS imposes a significant burden on patients and healthcare systems due to its prevalence and lack of successful treatments [4]. It is one of the most common outpatient diagnoses in primary care and gastroenterology [5].

Most people with IBS have mild symptoms. Many people don't recognize IBS symptoms. Yet, IBS is one of the most common disorders seen by physicians. Not all individuals with IBS symptoms seek medical care for their symptoms. Nevertheless, there are between 2.4 and 3.5 million annual physician visits for IBS in the United States alone. IBS is the most common disorder diagnosed by gastroenterologists and accounts for up to 12% of total visits to primary care providers [6].

A significant proportion—35% to 40%—of individuals who report IBS in the community are male. Approximately 60% to 65% of individuals who report IBS in the community are female [6].

There are not many studies that include both medical and non-medical students together. Similar studies about the prevalence of IBS among medical students from South America [7], Pakistan [8], Saudi Arabia [9] reveal prevalence rates of 21%, 28.3%, 31.8% consequently.

A study was conducted in Egypt by Ahamed *et al.* in an urban area in Suez governorate from January 2008 to August 2009. 117 individuals were included in this study. Rome II criteria were used for the diagnosis of IBS. The prevalence of IBS among the study sample was 34.2% [10].

Another study was conducted in Sues, Egypt, aimed to explore the prevalence of irritable bowel syndrome (IBS) among Suez Canal university students. Using Rome criteria III IBS module, total (170) students (whose mean age is 20 ± 0.82), the prevalence of IBS according to Rome III criteria in Suez Canal University is 22.9%. 23.8% are diseased in the faculty of commerce while 22.1% in faculty of medicine. Females in this study represent 64.1% of the sample, 30.3% of them are diseased, while males represent 35.9% about 9.8% of them are diseased. IBS constipation predominant type is 28.2%, diarrhea predominant type is 15.4%, mixed type is 46.2%, and the un-subtyped cases represent 10.3% [11].

Findings from a cross-sectional study to assess the prevalence and factors associated with irritable bowel syndrome among university students in Lebanon reported that an overall prevalence of IBS of 20% was recorded among university students, females were significantly more likely to report having IBS than males (29.1% vs 18.2%, $P < 0.01$). Those living at the school dormitory or in a private residence (39.5%) were more likely to have IBS than those living with their families (16.3%) ($P < 0.01$). The multivariate analysis showed that those who had a relatively high family income level (US\$ > 2000) were almost 6 times more likely to report having IBS than their counterparts [12].

IBS sub classification According to the Rome III criteria, and on the basis of the patient's stool characteristics [13]:

- **IBS with diarrhea (IBS-D):**
 - Loose stools >25% of the time and hard stools <25% of the time.
 - Up to one-third of cases.

- More common in men.
- **IBS with constipation (IBS-C):**
- Hard stools >25% of the time and loose stools <25% of the time.
- Up to one-third of cases.
- More common in women.
- **IBS with mixed bowel habits or cyclic pattern (IBS-M):**
- Both hard and soft stools >25% of the time.

2. Aim of the Study

To determine the overall prevalence, prevalence of each type and risk factors of IBS among Northern Border University students, Arar, Kingdom of Saudi Arabia.

3. Material and Methods

Type of the study: Cross sectional, descriptive study.

Sampling: Multistage cluster probability sample.

Using Rome III criteria questionnaire of IBS; which is a self-administrated consists of ten questions assessing the current status of an apparently normal person. Each question can be answered according to a scale describing the frequency of experiencing each symptom.

According to Rome III criteria, IBS is defined as recurrent abdominal pain or discomfort at least 3 days per month in the last 3 months associated with two or more of the following:

- 1) Improvement with defecation;
- 2) Onset associated with a change in frequency of stools;
- 3) Onset associated with a change in form (appearance of stool).

Also, these criteria should be fulfilled for the last 3 months with symptom onset at least 6 months before diagnosis [14] [15].

The questionnaire was distributed to Northern Border University students; 250 questionnaires were distributed but only 228 completely filled and returned to us with a response (91.2%), a population consisting of (125) students of the faculty of medicine & non-medical (103) students of the faculty of Education with total (228), during the period from November 2015 to April 2016.

The questionnaire included question about socio-demographic characteristics of the participants, including age, sex, marital status and average family income per month. Data of Rome III criteria questionnaire of IBS were included in addition to history of repeated exposure to stress and sense of irritability, history of smoking, height and weight for body mass index (BMI).

Participants were provided with the questionnaire and they gave it back at the same day. Well trained data collecting team were responsible for distributing the questionnaire and providing help while participants filling it.

4. Ethical Considerations

This study was reviewed and approved by the Research Ethics Committee of Faculty of Medicine, Northern Border University. Participants were informed that participation is completely voluntary, and written consent was obtained from each participant before being subjected to the questionnaire and after discussing the objective with the participants. No names were recorded on the questionnaires. All questionnaires were kept safe.

5. Statistical Analysis

Data were analyzed using statistical package for social science (SPSS) version 16.comparison between groups was assessed using the chi-squared test, with a 95% confidence interval (CI), p-value less than 0.05 was considered statistical significant.

6. Results

In **Table 1**, this study included 228University students of them, 92 (41.2%) males and 134 (58.8%) females. The overwhelming majority (98.2%) of participants were equal or less than 25 years old, single students were 92.1% compared to married 7.9%.

Table 1. Socio-demographic characters, BMI, stress and smoking history of medical and non medical students of NBU, Arar, KSA, 2016.

Parameter	No.	%
Age		
≤25	224	98.2
>25	4	1.7
Sex		
Male	92	41.2
Female	134	58.8
Marital status		
Single	210	92.1
Married	18	7.9
Family income		
2000 SR*	20	8.8
8000 SR or more	208	91.3
Body mass index (BMI)		
<18.5	12	5.2
18.5 - 24.9	79	34.6
25 - 29.9	63	27.6
30 - 34.9	44	19.3
>35	30	13.2
Psychic stress and irritability		
Yes	136	59.6
No	92	40.4
Smoking		
Yes	3	1.3
No	225	98.7

SR* Saudi Ryal.

With regard to BMI, nearly one third (34.6%) of the students were normal compared to more or less similar percentage obese (32.5%) and small percentage (5.2%) underweight.

The majority of respondents (59.6%) reported having psychic stress and irritability, while smoking reported only in small percentage of them (1.3%).

Table 2 illustrates the prevalence of IBS between medical and non medical students of NBU. Regarding the prevalence of irritable bowel syndrome, the students who are not diseased were more than those who were diseased as the not diseased students were 67.5% while the diseased were 32.5%. Disease prevalence was 33.6% in females and 30.9% in males. Among the study participants, the most common type of IBS was the mixed one 12.7%, followed by the constipation predominant type 10.5%, then the diarrhea predominant type 5.7% while the least common is un-subtyped cases (3.5%).

Table 3 illustrates the prevalence of types of Irritable Bowel Syndrome (IBS) and distribution of found cases regarding colleges of NBU. Of the found cases among students, it is obvious from the table and (**Figure 1**) that, more than one third (39.2%) had a mixed IBS type followed by constipation predominant IBS in nearly one third 32.4%, diarrhea predominant in nearly one fifth and lastly small percentage (10.8%) un-subtyped. Regarding distribution of IBS found cases according to colleges, it is clear from the table and (**Figure 2**) that, from 74 cases there was 23 (31%) of cases medical and 41 (69%) non medical students.

Table 4 shows the relation between the IBS and socio-demographic characters, smoking, psychic stress and BMI among the studied students. IBS was not significantly associated with age, marital status, smoking and income of the participant. However, statistically significant increased prevalence of this disease was found among

Table 2. The prevalence of Irritable Bowel Syndrome (IBS) and its types between medical and non medical students of NBU, Arar, KSA, 2016 (n = 228).

Parameter	No.	%
IBS among the total number of participants		
Not diseased	154	67.5
Diseased	74	32.5
Types of IBS among the total number of participants		
Not diseased	154	67.5
Mixed	29	12.7
Constipation predominant	24	10.5
Diarrhea predominant	13	5.7
Un-subtyped	8	3.5
Distribution of IBS found cases regarding sex		
In males (n = 94)	29	30.9
In females (n = 134)	45	33.6

Table 3. The prevalence of types of Irritable Bowel Syndrome (IBS) and distribution of found cases regarding colleges of NBU, Arar, KSA, 2016 (n = 74).

Parameter	No.	%
Types of IBS among the found cases (n = 74)		
Mixed	29	39.2
Constipation predominant	24	32.4
Diarrhea predominant	13	17.6
Un-subtyped	8	10.8
Distribution of IBS found cases regarding colleges (n = 74)		
Medical	23	31
Non-medical	41	69

female students (60.8%) (p-value < 0.05), the students who experienced Psychic stress and irritability (79.7%) (p-value < 0.05) and student who are obese (p-value < 0.001).

7. Discussion

This study was conducted to determine the prevalence of IBS among Northern Border University students through the Rome III criteria IBS module. The prevalence of IBS according to the present study was 32.5% which is in line with the finding of a cross-sectional study conducted among medical students and interns at King Abdulaziz University, Jeddah by Ibrahim *et al.* [9] where the prevalence of IBS was 31.8%. In addition, the finding of the current study is consistent with the findings of Ahmed *et al.* [10] who conducted a study in an urban area in Suez governorate and found that the prevalence of IBS among the studied population was 34.2%.

On the other hand, the prevalence of IBS in the current study is higher than the findings of Darweesh *et al.* [11] who conducted a study among students in Suez Canal University, Egypt and revealed that only 22.9% of the studied students were diseased and the findings of a study conducted in Karachi, Pakistan by Naeem *et al.* [16] where the prevalence of IBS was found to be 28.3%.

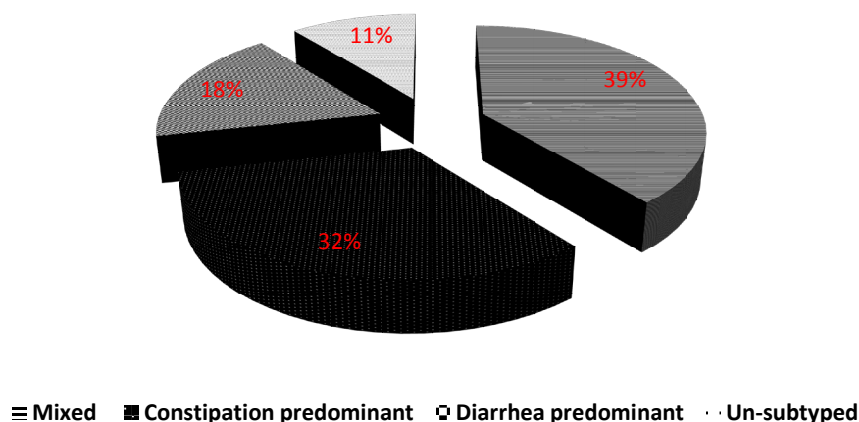


Figure 1. Types of IBS among the diseased students n = 74.

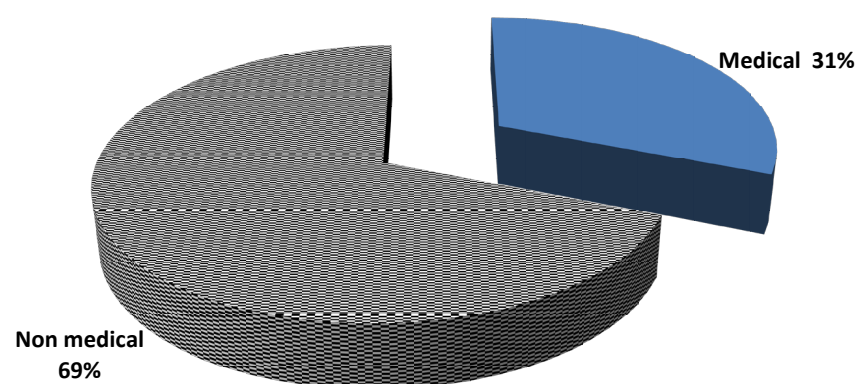


Figure 2. Prevalence of IBS among medical and none medical students n = 74.

Results revealed that 39.2% of the diseased students had a mixed IBS type and 32.4% had constipation predominant IBS which is inconsistent with the findings of a study conducted among Japanese university students by Shiotani A *et al.* [17] who revealed that the constipation predominant type was more prevalent (47.8%). However, findings of the present study is in agreement with the results revealed by Naeem *et al.* [16] where the most common type was the mixed IBS type followed by constipation predominant IBS.

As regards the relationship between socio-demographic characteristics and irritable bowel syndrome among the studied students, our study revealed that no significant relation between them, this is in agreement with Al-Ghamdi, *et al.* [18] who revealed that age, marital status and smoking had no significant effect on the presence of IBS in a cross sectional study conducted on medical student studying in Prince Sattam bin Abdulaziz University, Al-Kharj, Saudi Arabia. On the other hand, Naeem *et al.* [16] found that age was significantly associated with the prevalence of IBS where 60.7% of the individuals associated with IBS belonged to age-group 21 - 23 years followed by age-group 18 - 20 years (33.3%). In another study conducted by Liu *et al.* [19], age had a significant effect on IBS.

In the current study, stress among the students, regardless of its source was proved to be a major risk factor associated with the development of irritable bowel syndrome, interestingly this consistent with Al-Ghamdi, *et al.* [18].

The present study revealed a significant effect of body mass index ($P = 0.031$) on the prevalence of the disease between the respondents. This finding is consistent with Ibrahim *et al.* [9] where BMI of respondents significantly affected the prevalence of IBS. On the other hand, Liu *et al.* [19] revealed that BMI had no significant effect on IBS prevalence.

8. Conclusion

The results of this study concluded the prevalence rate of 32.5% for IBS among the students studying in Northern

Table 4. The relationship between socio-demographic characteristics and irritable bowel syndrome among the studied females, Arar, KSA, 2016.

Parameter	Irritable bowel syndrome		Total (n = 228)	Chi Square	P-value
	No (n = 154)	Yes (n = 74)			
Age group					
≤25	151 (98.1)	73 (98.6)	224 (98.2)	0.483	0.785
>25	3 (1.9)	1 (1.4)	4 (1.7)		
Sex					
Male	65 (42.2)	29 (39.2)	94 (41.2)	3.66	0.04
Female	89 (57.8)	45 (60.8)	134 (58.8)		
Marital status					
Single	141 (91.6)	69 (93.2)	210 (92.1)	0.568	0.753
Married	13 (8.4)	5 (6.8)	18 (7.9)		
Family income					
2000-	14 (9.1)	6 (8.1)	20 (8.8)	1.957	0.581
8000 or more	140 (89.6)	68 (91.9)	208 (91.3)		
Mean ± SD	12000 ± 1400	9000 ± 1800	13000 ± 3200	NA	0.041*
Smoking					
Yes	2 (1.3)	1 (1.4)	3 (1.3)	0.001	0.694
No	152 (98.7)	73 (98.6)	225 (98.7)		
Presence of psychic stress and irritability					
Yes	77 (50.0)	59 (79.7)	136 (59.6)	18.354	0.000
No	77 (50.0)	15 (20.3)	92 (40.4)		
Body mass index (BMI)					
<18.5	8 (5.2)	4 (5.4)	12 (5.2)	11.52	0.031
18.5 - 24.9	69 (44.8)	10 (13.5)	79 (34.6)		
25 - 29.9	56 (36.4)	17 (22.9)	63 (27.6)		
30 - 34.9	25 (16.2)	19 (25.7)	44 (19.3)		
>35	6 (3.9)	24 (32.4)	30 (13.2)		

*Independent sample t test was used.

Border University. Stress and high body mass index were significantly associated with IBS. In addition, this study concluded that IBS was not significantly associated with socio-demographic characteristics and smoking.

Recommendations

- 1) It is recommended to use screening approach for IBS and related psychological symptoms and problems.
- 2) In order to make the students capable to cope up and overcome the stressors during their studies or assignment or work, there is a primary requirement of stress management courses.

Conflict of Interests

The authors have not declared any conflict of interests.

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