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Original Research Article

Prevalence of Irritable Bowel Syndrome and its Association with Anxiety among Students of AL-Kindy College of Medicine

Israa Mohammad Abd AL-Khaliq[1*]

[1]HLA Typing Unit, Al-Kindy College of Medicine, Baghdad University, Baghdad, Iraq

***Corresponding Author:** Israa Mohammad Abd AL-Khaliq **Email:** israaalhasan@yahoo.com
HLA Typing Unit, Al-Kindy College of Medicine, Baghdad University, Baghdad, Iraq

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Abstract: ***Background*:** Irritable bowel syndrome (IBS) is a functional bowel syndrome with discomfort and changed bowel habits in the absence of obvious structural abnormalities. It is more common among adolescents and young age groups. ***Aim*:** Aims of the study is to identify the prevalence of Irritable Bowel Syndrome among medical students of AL- Kindy College of medicine, and to Exploring the effect on IBS prevalence of general demographic form to observe the association between anxiety and IBS. Data were collected on a sample of University of Baghdad, Al-Kindy College of Medicine students in Baghdad, Iraq. The study was conducted over a period for 6 months From December 2020 to June 2021. This study enrolled 250 students who were selected randomly for the purpose of the study, from different stages (1-5), of both genders, randomly collected. The results shown there was a significant correlation between IBS diagnosed patients and gender, and this led to the fact that females are more likely to have IBS since (79.04%) of ill females than males (20.9%). Also, there was a significant correlation regarding the food hypersensitivity (0.002), chronic problems (0.000), regular medication (0.009) and family history of IBS (0.000). Regarding relationship between stress levels and IBS, results showed a significant relationship between stress levels and IBS ($p = 0.000$), students who experience higher levels of stress and anxiety while studying are more exposed to IBS and concluding the IBS subtypes, the majority of the IBS diseased students 58(55.2%), have only abdominal pain and bloating or both. While students with constipation (IBS C) were more frequent 27 (25.7%) than students with diarrhoea (IBS D) 15 (14.2%) while only 5 (4.76%) had mixed diarrhea and constipation (IBS M). ***Conclusions*:** In conclusions the overall prevalence of IBS in this study was (42%) and prevalence of IBS was higher among females than among males. More than 60% of students had mild to moderate or high levels of anxiety.

Keywords: Irritable Bowel Syndrome, Anxiety, Students.

1. INTRODUCTION

Irritable bowel syndrome (IBS) is a functional bowel syndrome with discomfort and changed bowel habits in the absence of obvious structural abnormalities [1]. IBS symptoms and etiologic are traditionally thought to be with unknown underlying pathological explanation. It has been known that many physical, behavioural, and psychological factors contributed to IBS's pathogenesis. Patient's conditions are exacerbated by stress, anxiety, and abnormal attitudes towards illness which are related to IBS's pathogenesis [2]. IBS is known to be as one of the most highly predominant and costly gastrointestinal (GIT) syndrome that has an undeniable impact on the healthcare and patients' life quality. However, and according to the main stool pattern, IBS is divided into two subgroups: Constipation-IBS (IBS-C) and Diarrhea-IBS (IBS-D), therefore, it is considered to be a heterogeneous disorder [3]. Currently the diagnosis of irritable bowel syndrome is based on the Rome III diagnostic criteria. These criteria state that in order for a diagnosis of IBS to be given, patients must satisfy the following:

At least 3 months, with onset at least 6 months previously of recurrent abdominal pain or discomfort associated with 2 or more of the following: It is relieved with defecation, and/ or Onset is associated with a change in frequency of stool, and/ or Onset associated with a change in form of stool [4, 5]. Studies in Iraq revealed that IBS prevalence was common among hypertensive patients, high school students and university medical students

[8, 9]. Like some countries the percentage 64.8% were females with anxiety in comparison to 35.2% males in Mosul in 2019 [9].A study was done in 2013 in Jeddah revealed an IBS prevalence of 31.8% in all participants [6].Another study in Lebanon in 2015 has reported a prevalence of 20% [7].The worldwide distribution of IBS among general population is ranged from 5.7% to 34%. IBS, like many other poorly understood disorders, is viewed as a multifactorial disease, its symptoms and clinical outcome may depend on the interaction of several factors which include psychological factors, dietary factors, menstrual cycle, post infections, abdominal and pelvic surgery, and genetics and familial aggregations [10, 11].

Psychosocial and social diseases are considered the most important factor in terms of who complaining from IBS and how sever it becomes. One of the psychological factors is the stress which is widely believed to have a major role in functional gastrointestinal disorders (FGID) especially IBS, by either precipitating or exacerbating of its symptoms. At referral centres as many as 60 % of patients with IBS have psychiatric symptoms, including depression, anxiety, somatization, and personality disorders [12]. Pathogenesis and pathophysiology of IBS are complex and incompletely understood. In the pathogenesis of IBS altered gastrointestinal motility, visceral hypersensitivity, post-infectious reactivity, brain-gut interactions, alteration in fecalmicroflora, bacterial overgrowth, food sensitivity, carbohydrate mal absorption, and intestinal inflammation all of them were implicate [13]. As one does not know the etiology of IBS, no specific treatment regimen exists. The first line of treatment for patients with mild or moderate types of IBS is exploration of possible dietary or behavioural triggers. Use of pharmacologic therapy is often aimed at the predominant symptom in the individual patient. Some patients may benefit from an increase in fiber intake [14].The treatment options are wide ranging and include symptomatic prescribing, dietary management and a range of psychotherapeutic and complementary therapies [15].

2. METHODOLOGY

This is a cross-sectional study that was conducted on a sample of University of Baghdad, Al-Kindy College of Medicine students in Baghdad, Iraq. The study was conducted over a period for 6 months From December 2020 to June 2021. This study enrolled 250 students who were selected randomly for the purpose of the study. The targeted medical students were from 1st, 2nd, 3rd, 4th and 5th years, with age groups ranged from (18-23) from both genders.

Data were collected online using self-administered questionnaire, three self-administrated questionnaires were adopted. The first questionnaire was for socio-demographics characteristics age, gender, monthly family income, personal habits (smoking, daily sleeping hours and daily meals), food hypersensitivity, medical history of chronic diseases and family history of IBS, the second one about history of stressful life events, and the third questionnaire was Rome III diagnostic criteria to identify types of IBS (IBS-D, IBS-C).

3. Statistical Analysis

Data were analysed by using Statistical Package for Social Sciences (SPSS), and using Chi-square test to observe the association between categorical study variables. A p-value of ≤ 0.05 also uses to report the statistical significance of results.

4. RESULTS

Total number of (250) participants of Al-Kindy College Medical students, the majority of students were females (180) compared to (70) males. Commonly, number of the students who are not diseased, were 145 (58%) and those who are diseased were 105 (42%), as shown in (Table 1 and Figure 1). Demonstration the demographic characteristics of the study sample related to age, gender, monthly family income, personal habits (smoking, daily sleeping hours and daily meals), food hypersensitivity, medical history of chronic diseases and family history of IBS. Samples were grouped into five age groups from first, 2nd, 3rd, 4th and 5th years in college, age groups were ranged from (18-23). Results shown there was a significant correlation between IBS diagnosed patients and gender, and this led to the fact that females are more likely to have IBS since (79.04%) of ill females than males (20.9%). Also, there was a significant correlation regarding the food hypersensitivity (0.002), chronic problems (0.000), regular medication (0.009) and Family history of IBS (0.000) (Table 2). Regarding relationship between stress levels and IBS, results showed a significant relationship between stress levels and IBS ($p = 0.000$), students who experience higher levels of stress and anxiety while studying are more exposed to IBS, as in (Table 3 and Figure 2).

The distribution of IBS diseased students according to their symptoms (Figure 3) and concluding the IBS subtypes in (Table 4 and Figure 4), the majority of the IBS diseased students 58(55.2%), have only abdominal pain and bloating or both. While students with constipation (IBS C) were more frequent 27 (25.7%) than students with diarrhea (IBS D) 15 (14.2%) while only 5 (4.76%) had mixed diarrhea and constipation (IBS M).

Table 1: Frequency of irritable bowel syndrome and non- irritable bowel syndrome among students according to gender

		Total	IBS		No IBS	
			Count	%	Count	%
Gender	**Total**	**250**	**105**	**42.0%**	**145**	**58.0%**
	Female	180	83	46.1%	97	53.9%
	Male	70	22	31.4%	48	68.6%

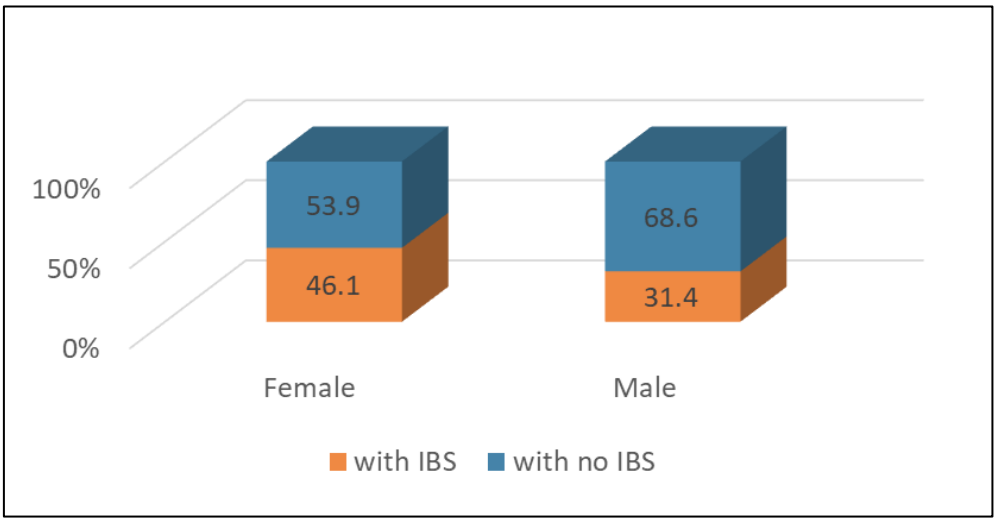

Figure 1: Distribution of IBS diseased students according to their gender

Table 2: Demographic characteristics and academic data among participants

Characteristics		IBS		No IBS		P-value
		Count	%	Count	%	
Gender	Female	83	46.1%	97	53.9%	0.35
	Male	22	31.4%	48	68.6%	
Year in College (In 2020-2021)	First	13	26.0%	37	74.0%	0.102
	Second	22	44.0%	28	56.0%	
	Third	23	46.0%	27	54.0%	
	Fourth	21	42.0%	29	58.0%	
	Fifth	26	52.0%	24	48.0%	
Smoking	Yes	16	55.2%	13	44.8%	0.126
	No	89	40.3%	132	59.7%	
Eating regular meals	Yes	54	38.8%	85	61.2%	0.259
	No	51	45.9%	60	54.1%	
Food hypersensitivity	Yes	33	60.0%	22	40.0%	0.002
	No	72	36.9%	123	63.1%	
Monthly family income	< 400 $	22	45.8%	26	54.2%	0.800
	400 $ - 1200 $	45	42.1%	62	57.9%	
	> 1200 $	38	40.0%	57	60.0%	
Hours of sleep	Less than 8 hours	60	43.2%	79	56.8%	0.676
	More than 8 hours	45	40.5%	66	59.5%	
Hours of study per day	Less than 3 hours	43	40.6%	63	59.4%	0.271
	6-9 hours	54	46.2%	63	53.8%	
	More than 9 hours	8	29.6%	19	70.4%	
Chronic problems	Yes	39	72.2%	15	27.8%	0.000
	No	66	33.7%	130	66.3%	
Regular medication	Yes	33	56.9%	25	43.1%	0.009
	No	72	37.5%	120	62.5%	
Family history of IBS	Yes	84	56.0%	66	44.0%	0.000
	No	21	21.0%	79	79.0%	

Table 3: Relationship between IBS and levels of anxiety and stress during studying among students

	Anxiety and Stress									
	normal		mild		moderate		sever		extremely sever	
	Count	%	Count	%	Count	%	Count	%	Count	%
Total	**65**	**100.0%**	**66**	**100.0%**	**67**	**100.0%**	**32**	**100.0%**	**20**	**100.0%**
IBS	17	26.2%	20	30.3%	34	50.7%	22	68.8%	12	60.0%
No IBS	48	73.8%	46	69.7%	33	49.3%	10	31.3%	8	40.0%
P-value	0.000									

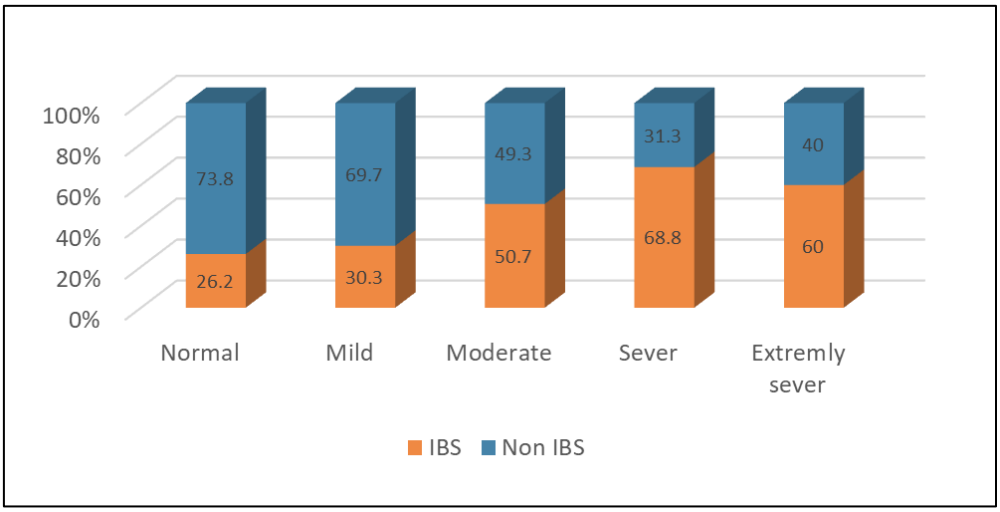

Figure 2: Distribution of IBS diseased students according to anxiety levels

Table 4: Subtypes of IBS according to predominant bowel habit

IBS type	Count	%
Total	**105**	**100%**
Diarrhea (IBS-D)	15	14.2%
Constipation (IBS-C)	27	25.7%
Mixed (IBS-M)	5	4.76%
Unclassified only abdominal pain & bloating	58	55.2%

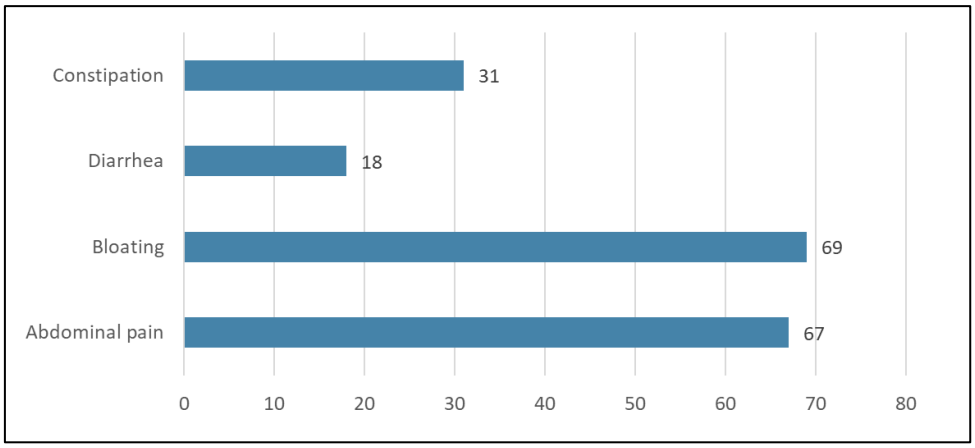

Figure 3: Distribution of IBS diseased students according to the IBS symptoms

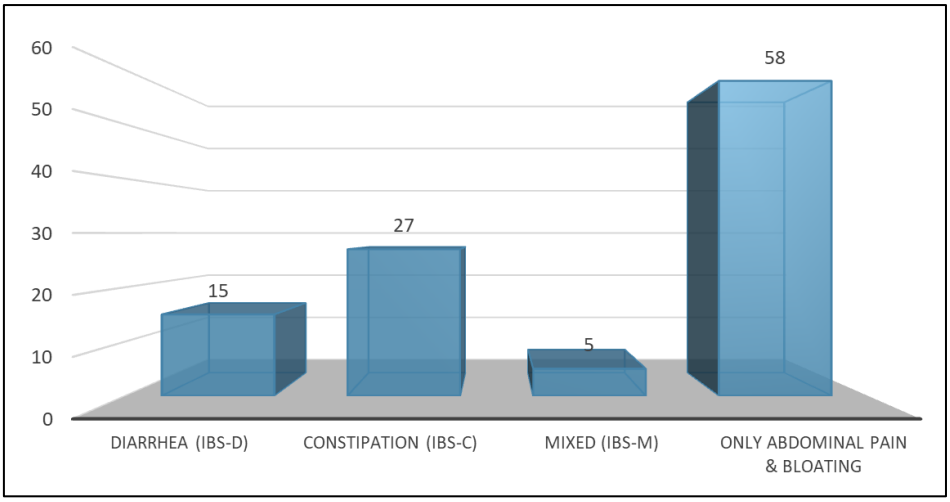

Figure 4: Distribution of IBS diseased students according to the IBS subtypes

5. DISCUSSION

IBS is a common chronic gastrointestinal disorder and determining its prevalence is important for health economies, although it is one of the least well understood disease encountered in practice. Regarding sex distribution of our patients, there was female's predominance, it was agreed with other study done in Mosul city [9], this could be related to the fact that sex hormones may have a role in the development of IBS [16], but it was disagreed with a Korean study reported that prevalence ratio of IBS in the Korean population is similar between males and females [17].

Regarding age distribution of our patients, it was found that the highest prevalence of irritable bowel syndrome was recorded in the fifths stage (22-23) years age group, it was matched with a study done by Puerto [18], with lowest prevalence among first stage and almost equal prevalence in the second, third and fourth stages, and this may probably because of the increasing load of work, studying and responsibilities. Considering the smoking, results showed that IBS was more prevalent among non-smokers, yet it's not a significant risk factor, it was in agreement with study done in Pakistan [2], but disagreed with study conducted in Syria, reported that cigarette smoking not associated with IBS [19]. One of the oldest researches to find a possible association between smoking and IBS was carried out by Burns (1986), where he postulated that the protective role of smoking in ulcerative colitis might also be applicable to IBS, since there were a higher number of non-smokers in the IBS group of his study [20].

Our study showed that regular meal is not risk factor in patients with IBS, and this result was similar with study done in Lebanon [19], but dissimilar to other study that considered it as a risk factor [20]. Findingsproduced a relationship between IBS and food hypersensitivity (31.4%), matched with a study conducted in Saudi Arabia [21]. This association could be explained by an exaggerated gastrocolic response, abnormal eating behavior, or psychologic distress rather than food allergy or intolerance. Regarding monthly family income, our results showed there was no significant difference noted, but some studies suggested that IBS was associated with lower socioeconomic status. A finding supported by the theory that lower income is associated with poorer health care outcomes, lower overall quality of life, and increased life stressors. However, others suggested that the opposite is true and that being in a higher socioeconomic group during childhood is associated with higher prevalence of IBS [22-25].

Considering sleeping hours, we have found that most of our samples had less than 8 hrs/day, Sleeping less than 8 hrs/day was considered as a significant risk factor for IBS in study done in Medical Students in Beijing, China [26], while disagreed with other studies which did not support that [27, 28]. History of chronic problems was significant factor for IBS in this study. Findings from other studies were controversial; as some studies found chronic diseases a significant independent risk factor of IBS [27], other studies did not support such association [28].

Regarding regular medication intake and IBS, there was significance association between it, results agreed with a study done among Medical Students of North India [29], but disagreed with a study done in Saudi Arabia among medical students [30]. The differences of our results from the results of the other studies may be due to the difference of the age groups and the sample size. IBS was significantly related to family history in our study (56%), and this similar finding to a study done in US [31]. Several studies state the presence of high and low producer patients for pro and anti-inflammatory cytokines genes (a genes polymorphism directly) which is directly proportional to IBS [32]. Prevalence of anxiety in the patients with IBS in our study was 85% various between mild, moderate, sever, and extremely sever, while a study done in India found the prevalence of anxiety disorder was 37.1% in the patients with IBS [33]. The effects of stress on functions of gut are universal, and the major effects of stress on gastrointestinal tract include alteration in

gastrointestinal motility and visceral perception, increase in intestinal permeability, changes in intestinal endocrine, negative effect of intestinal mucosal blood flow, and negative effects on intestinal microbiota [34]. Psychosocial stressors in up to one-third of IBS patients would worsen abdominal pain and abdominal dissention.

Regarding IBS subtypes, the most common type found in this study was the constipation-predominant type of IBS (IBS-C) with a prevalence of (25.7%) then the diarrhoea-predominant type of IBS (IBS-D) is (14.2%) of the diseased students then the mixed type (IBS-M) is (4.76%) of the diseased students, matched results of study done on Japanese university students [35]. We have found a number of unclassified patients who have only abdominal pain and bloating which may occur with both types of IBS. Sensation of abdominal bloating may affect 10 to 30 % of healthy subjects and up to 96 % of patients with IBS [36]. Abdominal bloating is more often noted by females with IBS than males, with symptoms increasing in relation to menses [37]. Surveys done in Japan have found that abdominal bloating is the most bothersome symptom in irritable bowel syndrome with constipation (IBS-C) [38]. IBS symptoms such as abdominal pain and bloating occur or are exacerbated postprandial in approximately two-thirds of patients [39].

6. CONCLUSIONS

In conclusions the overall prevalence of IBS in this study was (42%), prevalence of IBS was higher among females than among males, the majority of IBS cases were highest among fifth-year medical students. IBS patients appeared to have a significant association with psychological factors (anxiety and stress), and more than 60% of students in this study had mild to moderate or high levels of anxiety, food hypersensitivity, chronic problems, Regular medication and familial history of IBS was found to be significant risk factors, smoking, regular meals, monthly family income and sleeping hours were found to be not significant risk factors.

According to these results, the university needs to develop a stress management program which may help students adapt to the stress that occurs during their studies at the university and prevent this type of dysfunctional bowel problem, stress management activities and student counseling sessions are recommended to decrease anxiety levels and to enable students to cope with different stressors during their academic lives, advocate constructing national programs for students to be conscious of their balanced diet to reduce their IBS suffering, health-care provider should provide the patient with information and reassurance that her/his condition is taken seriously and can be appropriately treated, the need to develop national awareness about causes, how to avoid and how to treat IBS. The awareness should be directed to medical staff as well.

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