

Irritable Bowel Syndrome: Prevalence, Type and Associated Factors among Male Adult residents at Al-Iskan Avenue in Makkah Almukarramah, Saudi Arabia

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Abstract

Background: Irritable bowel syndrome (IBS) is one of the most prevalent gastrointestinal disorders characterized by non-specific symptoms as abdominal pain and altered bowel habits with no known organic pathology. Its prevalence varies in different communities. Several hypotheses attempt to account for the pathophysiology of IBS, but the etiology remains uncertain or obscure, perhaps multifactorial.

Objectives: To estimate the prevalence of IBS and its associated factors as well as to identify the most common types of IBS among adult male populations in Al-Iskan Avenue in 2010.

Methods: It is a Cross-sectional community-based study included a randomly selected sample of adult male live in Al-Iskan avenue in Makkah Almukarramah. Rome III criteria were used for diagnosis of IBS. A self-administered questionnaire included demographic data, Rome III criteria and associated factors) was used for data collection.

Results: The study included 75 males. Approximately half of them (50.7%) were in the age group 26-45 years and 22.6% aged over 45 years. The majority of them were Saudi (85.3%). IBS was diagnosed among 20 out of 75 participants (26.7%), based on Rome III criteria. Overall, the symptom profiles were characterized by diarrhea (25.0%), constipation (25.0%) and alternating symptoms (50.0%). Approximately two-thirds of patients diagnosed as having IBS (65.5%) consulted a physician for this problem. IBS was significantly associated with psychological distress.

Conclusion: This study shows a higher prevalence of IBS in Al-Iskan Avenue, Makkah Alkukarramah than in other population. Most of them consulted a physician for their illness. IBS restricts social and daily activities and has a substantial impact on suffers' well-being and health, with considerable socioeconomic consequences.

Keywords: Irritable bowel syndrome; prevalence; Male; Adults; Saudi Arabia

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Running title: Irritable bowel syndrome in Saudi Arabia

Introduction

Irritable bowel syndrome (IBS) is defined as abdominal pain and discomfort with altered bowel habits in the absence of any other mechanical, inflammatory, or biochemical explanation for these symptoms. ⁽¹⁾ It is the most common functional digestive disorders. ⁽²⁾ The prevalence of IBS is ranged between 10-20 % worldwide. ^(1,2) It affects the quality of life of those who suffer from it, and accounts for large amounts of health care resources, both in primary and specialist care. ⁽²⁾ Although most persons with IBS do not consult physicians, the cost to society in terms of direct medical expenses such as drug consumptions and indirect costs, such as work absenteeism, is considerable. ^(3,4) They miss 3 times as many workdays, and are more likely to report that they are too sick to work. ⁽⁵⁾ In one survey, with work loss due to IBS cases was 13.4 days vs. 4 days in the control group. ⁽⁶⁾ After the common cold, IBS is the second largest cause of absenteeism in Canada. ⁽⁷⁾

In the USA, one third of the patients are under the care of general practitioners and 10-15% are referred to gastroenterologists. ⁽⁶⁾

Since a considerable part of the population suffers from IBS, health care costs for the management of IBS are high. In the USA, approximately 3.5 million medical visits and 2.2 million prescriptions are written as a result of IBS. ⁽¹¹⁾ Also, in many cases, sufferers have undergone unnecessary appendectomies, hysterectomies, cholecystectomies as well as other surgical procedures due to misdiagnosis. ⁽⁶⁾

It is estimated that \$1.6 billion in direct and \$19.2 billion in indirect costs, are related to IBS. ⁽¹²⁾

Traditionally, IBS is a diagnosis of exclusion, but recently, a consensus panel created and then updated the Rome criteria to provide a standardized diagnosis for research and clinical practice.

According to Rome III, ⁽¹³⁾ There are several types of IBS: a) diarrhea-predominant IBS; b) constipation-predominant IBS; c) alternating IBS (sometimes diarrhea, sometimes constipation); and d) undefined IBS.

This study aimed at estimating the prevalence of IBS, identifying its most common types as well as determining the factors associated with it among adult male populations in Al-Iskan Avenue in 2010.

Methodology

A cross sectional community based study among adult males live in Al-Iskan avenue in Makkah Almukarramah has been carried out. Al-Iskan avenue has 1466 villas distributed by numbers. The targeted population divided into three age groups as follow: group 1 (15-25) years, .group 2 (26-45) years and group 3 (>45) years. According to Central Department of Statistics and Information, the proportional of them is 27%, 50%, 23% respectively.

The sample was taken in two stages:

Stage 1: The sample size (75) was distributed to the villas by simple random technique. Stage 2: The sample size (75) was distributed to the age groups according to its proportional: 20 sample from group 1, 38 sample from group 2 and 17 sample from group 3 i.e: from each randomly

selected villa, one sample from one of the age groups was taken according to the availability. If any villa does not respond the researcher moved to the adjacent one.

Sample size

The optimal size was estimated using EPI info statistical program, based on the prevalence of IBS of 10% and on the total adult male live in Al-Iskan avenue of 9040. We considered the worst acceptable prevalence as 17% and the confidence interval as 95%. The calculated sample size was 70 adults. We added 10% to compensate for drop out, so to total invited adults was 77. Out of them 75 participated in the study with a response rate of 97.4%.

The researcher used the original Rome III criteria questionnaire, which is valid and used in many studies. The Rome III criteria (2006) for the diagnosis of irritable bowel syndrome require that patients must have recurrent abdominal pain or discomfort at least 3 days per month during the previous 3 months that is associated with 2 or more of the following: Relieved by defecation, onset associated with a change in stool frequency and onset associated with a change in stool form or appearance. Supporting symptoms include the following: altered stool frequency, altered stool form, altered stool passage (straining and/or urgency), mucorrhea and abdominal bloating or subjective distention.^(1, 13) Four bowel patterns may be seen with irritable bowel syndrome. These patterns include IBS-D (diarrhea predominant), IBS-C (constipation predominant), IBS-M (mixed diarrhea and constipation), and IBS-U (unspecified diarrhea and constipation).^(5, 13)

This questionnaire was translated to Arabic language and necessary modification was made to meet the objectives then validated from two family medicine consultant. It consists of three parts: demographic data, IBS diagnosis using Rome III criteria and associated factors.

The investigator himself collected the data. Firstly, villas were numbered and selected randomly. The questionnaire was self-administered. The investigator gave them to randomly selected participants and asked them to complete the forms. On next day, he returned and collected the forms. If there were any unclear questions, he explained them to participants and they completed the forms.

The researcher tested the reliability by retesting 10% of the participants to compare the answers. A correlation coefficient of 0.97 has been obtained.

Before conduction of the study, permissions from Joint Program of Family and Community Medicine in Jeddah, KSA was obtained and The O'mdah was informed.

Data entry and analysis:

The data was collected and verified by hand then coded before entry. Statistical Package for Social Sciences (SPSS) software version 16.0 was used for data entry and analysis. Descriptive statistics (e.g. number, percentage) and analytic statistics using chi square tests (χ^2) to test for the association and/or the difference between two categorical variables were applied. For all statistical tests done, P value equal or less than 0.05 was considered statistically significant.

Results

The study included 75 males. Their demographic characteristics are shown in table (1). Approximately half of them (50.7%) were in the age group 26-45 years and 22.6% aged over 45

years. More than two-thirds of them were married (68.0%). Most of them (72.1%) either were having university degree (45.4%) or post graduated (26.7%). Slightly more than half of them (50.6%) working in governmental places and 30.7% were not working. The majority of them were Saudi (85.3%).

Table (1): Demographic characteristics of the participants (n=75)

Socio-demographic variables	Number	%
Age in years		
15-25	20	26.7
26-45	38	50.7
> 45	17	22.6
Marital status		
Single	20	26.7
married	51	68.0
divorced	4	5.3
Educational level		
Primary schools	1	1.3
Intermediate schools	1	1.3
Secondary schools	19	25.3
University	34	45.4
Post-graduate	20	26.7
work status		
Not working	23	30.7
Governmental	38	50.6
Private	12	16.0
Retired	2	2.7
Nationality		
Saudi	64	85.3
Non-Saudi	11	14.7

Figure (1) displays that IBS was diagnosed among 20 out of 75 participants (26.7%), based on Rome III criteria. Overall, the symptom profiles were characterized by diarrhea

(25.0%), constipation (25.0%) and alternating symptoms (50.0%) as shown in table (2) and figure (2).

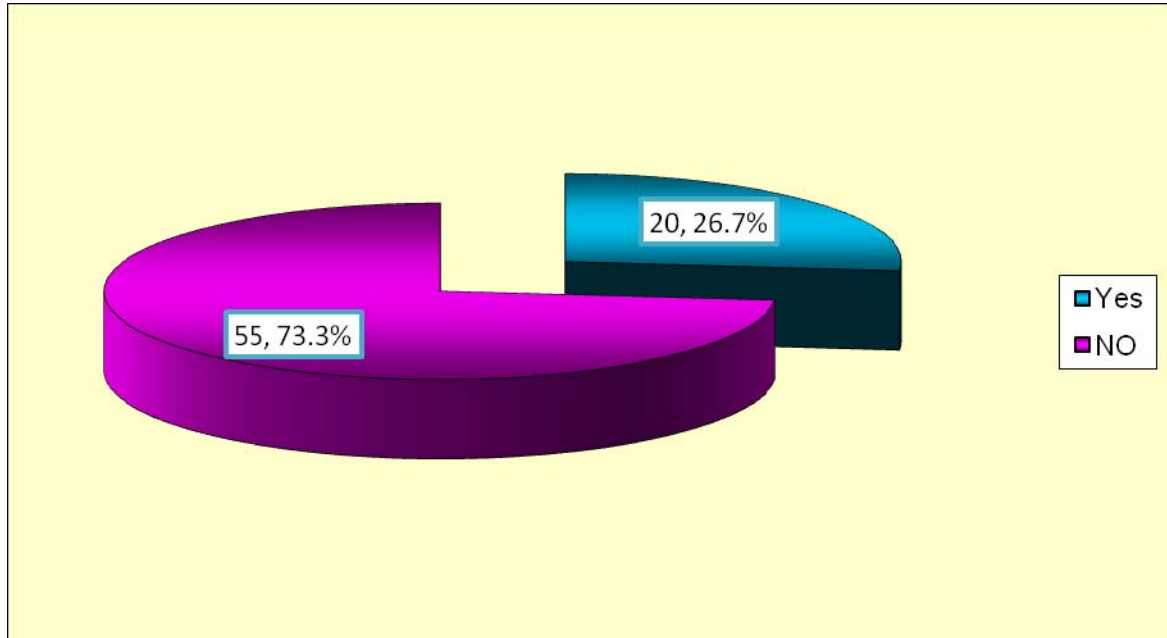


Figure (1): Distribution of the participants according to the diagnosis of IBS based on Rome III criteria (n=75).

Table (2): Distribution of patients with IBS according to its type (n=20)

Response	Diarrhea	Constipation
	No. (%)	No. (%)
NO	5 (25.0)	5 (25.0)
Sometimes (25%)	3 (15.0)	9 (45.0)
Often (50%)	10 (50.0)	3 (15.0)
Most of time (75%)	2 (10.0)	1 (5.0)

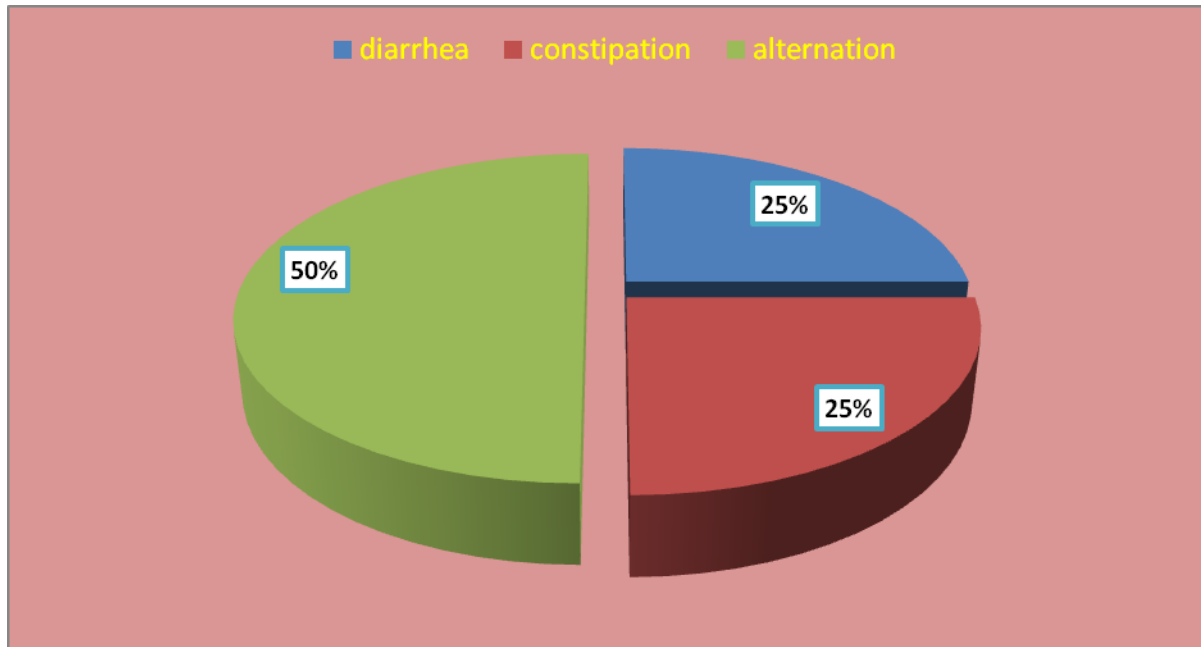


Figure (2): Distribution of the participants according to the type of IBS. (n=75).

Table (3) shows that approximately two-thirds of patients diagnosed as having IBS, according to Rome III criteria (65.5%), consulted a physician for this problem. Out of those consulted a physician (n=13), 10 patients (76.9%) diagnosed as IBS cases. More than half of patients consulted a physician (61.5%) agreed with their diagnosis as IBS cases. No investigations were done for 61.5% of those consulted a physician while all investigations were done (blood, stool and colonoscopy) for 23.1% of them. The diagnosis has changed after investigations as colitis in 30.8% of cases consulted a physician. More than half of the participants consulted a physician (61.5%) claimed that they received health education about the disease. As shown in figure (3), 25.0% of patients with IBS claimed that they used antibiotics in

the treatment of their disease. Similarly, 25% of those patients claimed that they have first-degree relatives with gastrointestinal tumours as obvious from figure (4). Figure (5) displays that; most of IBS patients had positive family history of IBS among their first-degree relatives (75.0%).

Table (3): Clinical history of IBS patients (n=20)

Symptoms	Number	Percentage
Consulting a physician	13	65.0
Diagnosed primarily as IBS*	10	76.9
Did you agree with that diagnosis*		
Yes	8	61.5
Doubt	4	30.8
No	1	7.7
What are investigations done?*		
None	8	61.5
Blood	1	7.7
Stool	1	7.7
Colonoscopy and biopsy	0	0.0
All investigations	3	23.1
Did the diagnosis change?*		
Yes**	4	30.8
No	5	38.4
Do not know	4	30.8
Did you receive health education?*		
Yes	8	61.5
No	5	38.5

* Only for those consulted a physician (n=13)

** The new diagnosis was colitis.

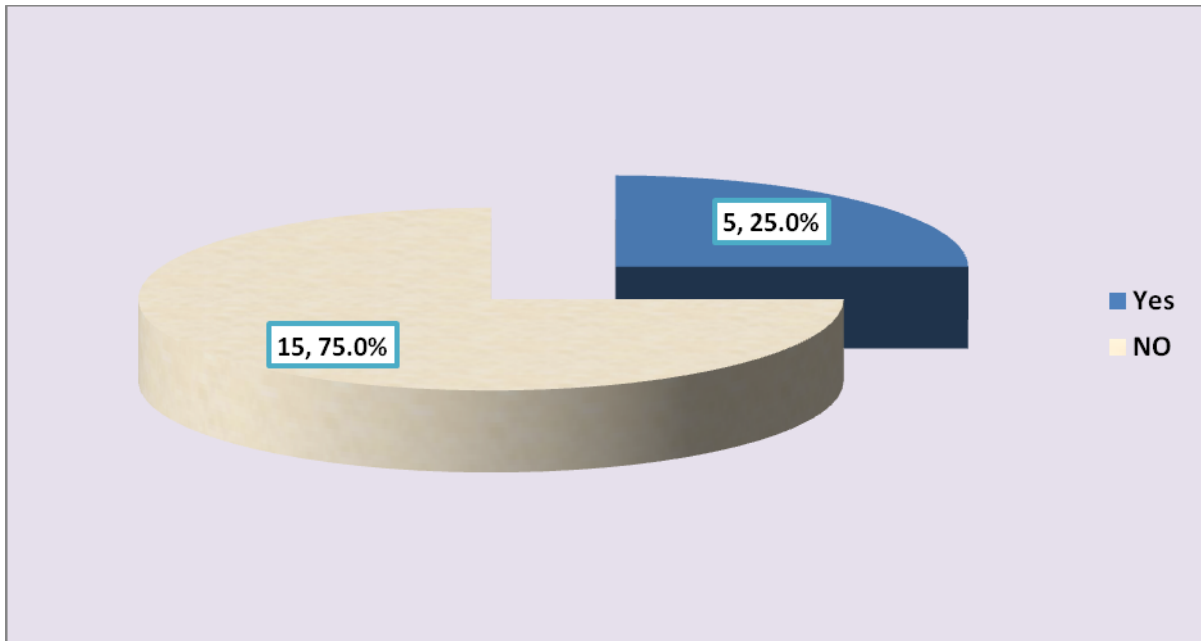


Figure (3): Use of antibiotics among patients with IBS (n=20).

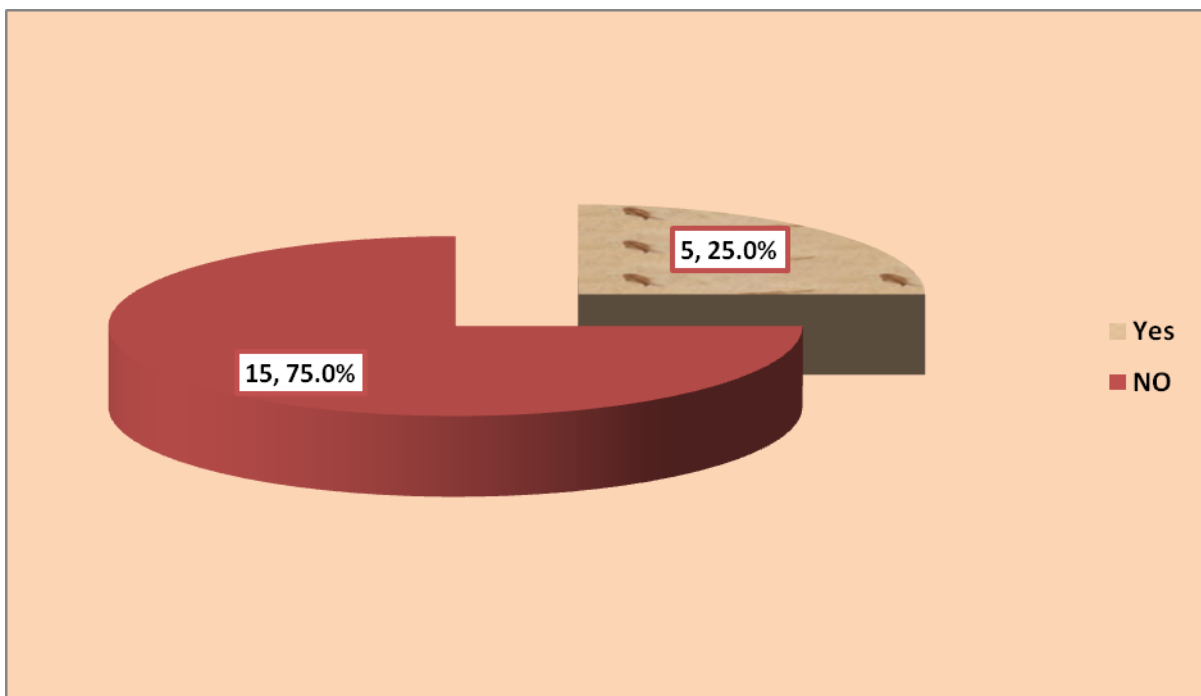


Figure (4): History of gastrointestinal tumours among first-degree relatives of IBS patients.

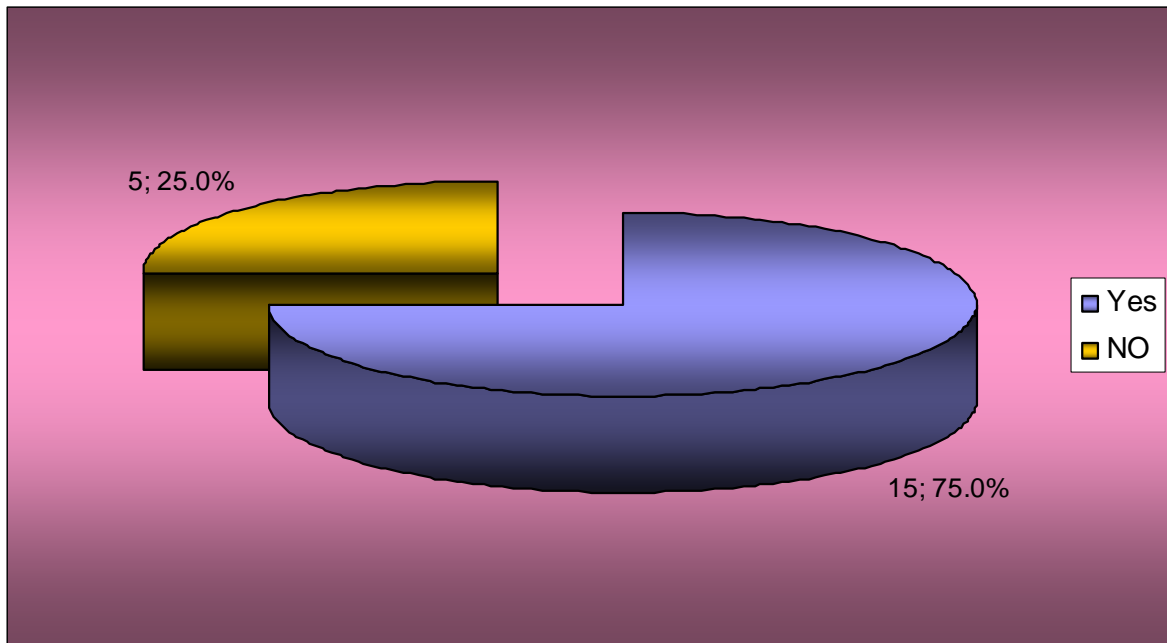


Figure (5): Family history of IBS among first-degree relatives of patients with IBS (n=20).

As shown in table (4), 25.0% of the patients diagnosed with IBS, according to Rome III criteria, did not agree with that diagnosis (n=5) and 30.0% were doubt about the diagnosis (n=6). Out of those (n=11), nine patients (81.8%) and two patients (18.2%) believed that they had inflammation and psychological problems respectively. Twenty-five percent of IBM patients had performed relaxation exercise and all of them claimed that they have been improved. Half of them (50.0%) followed a diet system and out of them, 90.0% have been improved. Similarly, half of them (50.0%) used medications in the treatment of IBS and out of them, 80.0% have been improved.

Table (4): Attitude of Patients with IBS towards the disease (n=20)

Symptoms	Number	Percentage
Do you agree that you are suffering from IBS?		
Yes	9	45.0
Doubt	6	30.0
NO	5	25.0
In your opinion, what is your problem*		
Inflammation	9	81.8
Tumors	0	0.0
Psychological problems	2	18.2
Did you perform relaxation exercise?		
Yes	5	25.0
NO	15	75.0
Did you feel better after relaxation exercise?***		
Yes	5	100.0
NO	0	0.0
Did you follow a diet system?		
Yes	10	50.0
NO	10	50.0
Did you feel better after diet system?****		
Yes	9	90.0
NO	1	10.0
Do you use medications for this problem?		
Yes	10	50.0
NO	10	50.0
Did you feel better with medications?*****		
Yes	8	80.0
NO	2	20.0

* Only for those who do not agree with the diagnosis as IBS (n=11).

** Only for those practiced relaxation exercise (n=5).

*** Only for those followed a diet system (n=10).

**** Only for those using medications for IBS (n=10).

Table (5) shows that among IBS patients, awakening from sleep with abdominal pain was the most common reported accompanying symptom as it was reported by 45.0% of them. Loss of

appetite, weight loss and bloody stool were reported by 30.0%, 25.0% and 15% of IBS cases respectively.

Table (5): Characteristics of patients with IBS according to accompanying symptoms (n=20)

Symptoms	Number	Percentage
Bloody stool	3	15.0
Awakening from sleep	9	45.0
Weight loss	5	25.0
Loss of appetite	6	30.0

It is obvious from table (6) that 60% of patients with IBS had loss of interest in favorite issues as compared to only 32.7% of those with no IBS. This difference was statistically significant ($P=0.033$). As shown in table (6), 65.0% of patients with IBS claimed that they had psychological upset in the last two weeks as compared to only 38.2% of those with no IBS. This difference was statistically significant ($P=0.039$).

Table (6): Association between IBS and loss of interest in favorite issues and psychological upset in the last two weeks among participants (n=75)

	IBS N=20 No. (%)	Non-IBS N=55 No. (%)	χ^2 (p-value)
Loss of interest in favorite issues in the last 2 weeks			
Yes (n=30)	12 (60.0)	18 (32.7)	4.55 (0.033)
NO (n=45)	8 (40.0)	37 (67.3)	
Psychological upset in the last 2 weeks			
Yes (n=34)	13 (65.0)	21 (38.2)	4.26 (0.039)
NO (n=41)	7 (35.0)	34 (61.8)	

As shown in table (7), absence from work was reported by 30.0% of IBS cases. Half of them absent for more than 4 days. Daily and social activities were negatively affected in almost two-thirds of IBS cases (65.0%). IBS Symptoms were exaggerated with work and/or home stressful situations in most of IBS cases (80.0%).

Table (7): Impact of IBS on Patients` life style (n=20).

Percentage	number	Life style variables
		Work Absentism
70.0	14	NO
30.0	6	Yes
33.3	2	1-2 days
16.7	1	3-4 days
50.0	3	>4 days
		Daily and social activities
65.0	13	Yes, affected
35.0	7	No
		Exaggeration of symptoms with work and/or home stressful situations.
80.0	16	Yes
20.0	4	NO

Discussion

The prevalence of IBS is high worldwide, although it varies according to the country and diagnostic criteria, which has been used. ⁽¹⁹⁾ It is affecting about 10% to 15% of North Americans. ⁽²⁰⁾ In western studies, the prevalence of IBS is mostly about 10-20% in adolescents and adults, ^(21, 22) although it is reported up to approximately 25% in some studies. ^(23, 24)

There are many Asian studies about the prevalence of IBS. In one study from Korea, Han et al. conducted a population based study that used telephone interviews using the Rome II criteria to diagnose IBS. In this Korean study, the prevalence of IBS was 6.6%. Subjects in their

20s had the highest IBS prevalence. ⁽²⁵⁾ In another study from Hong Kong, Kwan et al. reported the prevalence of IBS as 6.6% using the Rome II criteria. ⁽²⁶⁾ In china, Xiong et al. reported the adjusted prevalence of IBS in South China as 11.5% with the Manning criteria and 5.7% with the Rome II criteria. ⁽²⁷⁾ In Iran, the prevalence of IBS among medical students was 12.6%. ⁽²⁸⁾ When compared with the western studies, the prevalence in Asian countries were relatively low.

In the present study, the prevalence of IBS among males was 26.7% based on Rome III criteria. This high prevalence increased the demand for a population-based health survey in our region to supplement the Rome criteria with questions aiming to identify patients formally diagnosed but whose symptoms are currently under control, if prevalence is to be reliably estimated. IBS prevalence apparently has a wide range probably because of the various criteria used in diagnosis. There is no gold standard for IBS diagnosis. ⁽²⁹⁾

The paper by Nam et al. in the issue of prevalence of IBS in Korea raises several important points. First, they used the recently published Rome III criteria to diagnose IBS. Few studies have used these criteria to diagnose IBS. This paper can help us to know and compare the prevalence of IBS by Rome III. In this study, the prevalence of IBS was found to be 8.2% before and 9.1% after organic disease was excluded via colonoscopy. ⁽³⁰⁾ By the study of Han et al. in 2006, the prevalence was 6.6%, ⁽¹⁶⁾ and 9.6% by Lee et al. in 2009. ⁽³¹⁾ Both studies used the Rome II criteria. The difference of approximately 3% between studies in 2006 and 2009 may be explained by the increase in the prevalence of IBS. Recently, Wang et al. reported the accordance between Rome II and III to be good. ⁽³²⁾ In addition, Dorn et al. found that the accordance between the two criteria was acceptable (kappa 0.79), and that the prevalence and proportions of the subgroups were similar between two criteria. ⁽³³⁾ However, Sperber et al. reported the prevalence of IBS as 2.9% for Rome II and 11.4% for Rome III, concluding Rome II

as a much more strict criteria. ⁽³⁴⁾ Recently, Miwa reported the prevalence of IBS as 9.8% by Rome II and 13.1% by Rome III, and suggested that the Rome III criteria are more sensitive than the Rome II criteria. ⁽³⁵⁾ Second, this study excluded the organic bowel diseases through colonoscopy and laboratory exams, which was more accurate compared with many studies using only questionnaires through telephone or internet survey. By excluding the organic diseases with various tests, this study could estimate the prevalence of IBS more precisely.

IBS is found frequently in all age groups. ⁽³⁶⁾ However, the prevalence of IBS is higher in the younger age group than the older age group in many studies. ⁽³⁷⁻³⁹⁾ In agreement with that, our study showed that most of the IBS cases were under 45 years.

In the present study, overall the symptom profiles were characterized by diarrhoea (25.0%), constipation (25.0%) and alternating symptoms (50.0%). These findings were quite similar to have been reported by Wilson S et al, 2004 ⁽⁴⁰⁾. However, others ^(20, 28, 41) have reported different figures where cases were divided equally among IBS with constipation, IBS with diarrhoea, and IBS alternating between diarrhea and constipation.

The psychological distress is a well-known contributing factor for IBS and anxiety and depression are closely associated with IBS in many western studies. ⁽⁴²⁻⁴³⁾ In agreement with that, in the current study there was a significant association between IBS and Psychological upset and loss on interest in favorite issues as indicators of bad quality of life. The exact mechanism of psychological stress inducing the abdominal symptoms has not been discovered yet. Although recently, many researchers have reported that there is a bidirectional relationship between the brain (central nervous system) and the digestive tract. The most common opinion is that a complex reflex circuit between the cerebral cortex and the digestive system exists, and brain-gut axis dysfunction can generate digestive disorders. ⁽⁴⁴⁾

The study is the first IBS study in KSA using the Rome III criteria. In addition, this study analyzed the prevalence and characteristics of each subtype of IBS. However, this study has several limitations. First, the study population was limited to specific sector in Makkah, so this study population cannot represent the entire population of Makkah. Second, its small sample size. In spite of these limitations, this study has contributed greatly to the understanding of the epidemiology and risk factors of IBS in Makkah with recent updated diagnostic criteria. Conclusively, this study shows a higher prevalence of IBS in Al-Iskan avenue, Makkah Alkukarramah than in other population. Most of the IBS cases were under 45 years. Most of them consulted a physician for their illness. Psychological factors, although not part of IBS per se, have a significant association and consequently an important role in modulating the illness experience and its outcome. Implementation of health education campaigns for the general public to understand the epidemiology, risk factors and impact of IBS in KSA is highly recommended.

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