

The Common Causes of Irritable Bowel Syndrome (IBS) in Northern Saudi Arabia

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Abstract

Background: Several psychological factors have been linked to the etiology of irritable bowel syndrome (IBS). The aim of the present study was to assess the burden of psychological factors (anxiety, depression, and working status) in the etiology of IBS in Northern Saudi Arabia. **Methodology:** Data regarding IBS were attained from 930 Saudi volunteers existing in the city of Hail, Northern Saudi Arabia. A purposeful questionnaire was developed and used to obtain the required data. Each questionnaire was completed by a medical student in the course of the interview. **Results:** IBS symptoms were recognized in 46% of the study population of whom 38% were males and 62% were females. The risk of anxiety as a risk for IBS was statistically significant. The relative risk and 95% confidence interval (95% CI) = RR (95% CI) = 1.4801 (1.2608 to 1.7376), $P < 0.0001$. The risk of emotional stress as a risk for IBS was statistically significant. The relative risk and 95% confidence interval (95% CI) = RR (95% CI) = 1.5337 (1.2918 to 1.8211), $P < 0.0001$. **Conclusion:** IBS and IBS related symptoms are prevalent in Northern Saudi Arabia. IBS symptoms are significantly associated with anxiety, depression and to a lesser extent may be linked to occupation and daily working hours.

Keywords

Irritable Bowel Syndrome, Anxiety, Depression, Emotional Stress, Working Hours, Saudi Arabia

1. Introduction

Irritable bowel syndrome (IBS) is a chronic disorder that can considerably decrease the quality of life and work efficiency [1]. IBS is a public medical complaint that significantly alters the patient quality of life and makes a series of diagnostic and treatment challenges [2]. IBS upsets 7% to 21% of the universal population. The prevalence of IBS fluctuates amongst nations, as well as criteria

used to describe its manifestation. Females are at somewhat greater risk for IBS than males [3]. In Saudi Arabia, studies conducted on medical students and interns in Jeddah reported a prevalence of IBS of 31.8% [4].

The diagnosis of IBS depends on the documentation of characteristic symptoms and the barring of other organic illnesses. Managing of patients with IBS is enhanced by a personalized, complete way that holds dietary, lifestyle, medical, and behavioral interventions [1]. Investigation regularity in patients with IBS is intensely connected to demographic and clinical characteristics, mainly comorbid conditions associated with IBS. The existence of shared overlapping comorbid conditions should upsurge clinicians' sureness in making the diagnosis of IBS, thus limiting redundant investigation and decreasing healthcare expenditures [5].

Psychological factors have been conspicuously involved in the causativeness as well as upkeep of IBS. The high prevalence of psychiatric comorbidities such as anxiety and depression in IBS delivers evidence in consideration of appropriate screening for these conditions in gastrointestinal clinics. Identification and treatment for these comorbidities can enhance the quality of life as well as whole consequences [6]. For patients with IBS, mental illness, mainly depression and/or anxiety, leads to an additional subordinate quality of life [7]. As several studies reported that IBS is associated with increased psychological distress and mental comorbidity, like major depressive disorder and generalized anxiety disorder [8], our aim in the present study was to assess the burden of psychological factors (anxiety, depression, and working periods) in the etiology of IBS in Northern Saudi Arabia.

2. Materials and Methods

In this community based cross-sectional survey, data about IBS were obtained from 930 Saudi volunteers living in the city of Hail, Northern Saudi Arabia. Participants were randomly selected by simple random regardless of age, gender, education level, occupation. Randomization was done separately for each gender (taking numbers of respondents as, 1, 3, 5, 7, etc.). About 1300 persons were recruited and 930 (71.5%) persons have responded.

Data were collected during the period from October 2018 to January 2019.

A purposeful questionnaire was designed and used for obtaining the necessary data. Each questionnaire was filled by a medical student during the interview. The following information was obtained from each participant: age, sex, and education level, anxiety, anxiety frequency, depression, depression frequency, emotional stress, and working hours.

IBS symptoms were identified based on Rome III criteria.

2.1. Data Analysis

Statistical Package for Social Sciences (version 16) was used for analysis and to perform a Pearson Chi-square test for statistical significance (P value). The 95% confidence level and confidence intervals were used. A p value less than 0.05 was

considered statistically significant.

2.2. Ethical Consent

Each participant was asked to sign a written ethical consent during the questionnaire's interview. The informed ethical consent form was designed and approved by the ethical committee of the College of Medicine (University of Hail, Saudi Arabia) Research Board.

3. Results

The present study, involved 930 Saudi volunteers, their ages ranging from 18 to 78 years with a mean age of 34 ± 13.7 years. Out of 930 participants, 395/930 (42%) were males and 535/930 (58%) females. Greatest numbers of participants were found at the age groups 21 - 29 ($n = 360$), ≥ 50 ($n = 157$), and 40 - 49 years ($n = 151$). Males were predominantly seen at the age groups ≥ 50 ($n = 115$), 40 - 49 ($n = 97$) and 21-29 years ($n = 92$). Females were predominantly at 21 - 29 ($n = 268$), ≤ 20 ($n = 108$), and 30 - 39 years ($n = 63$), as indicated in **Table 1, Figure 1**.

The majority of the study population were found with university level of education ($n = 523$), and secondary education ($n = 245$), as shown in **Table 1, Figure 1**.

IBS symptoms were identified in 46% of the study population of whom (38%) were males and (62%) were females.

Anxiety was stated by 514 participants of whom 283 (55%) were found with IBS symptoms. The risk of anxiety as a risk for IBS was statistically significant. The relative risk and 95% confidence interval (95% CI) = RR (95% CI) = 1.4801 (1.2608 to 1.7376), $P < 0.0001$. Most patients experienced anxiety once daily 164/252 (65%) and the remaining 35% reported anxiety 2 to 3 times daily, as indicated in **Table 2, Figure 2**.

Table 1. Distribution of the study population by gender, age, and education.

Variable	Males	Females	Total
Age			
≤ 20 years	13	108	121
21 - 29	92	268	360
30 - 39	78	63	141
40 - 49	97	54	151
≥ 50	115	42	157
Total	395	535	930
Education			
Illiterate	33	27	60
Basic	27	38	65
Secondary	125	120	245
University	199	324	523
Post-university	11	26	37
Total	395	535	930

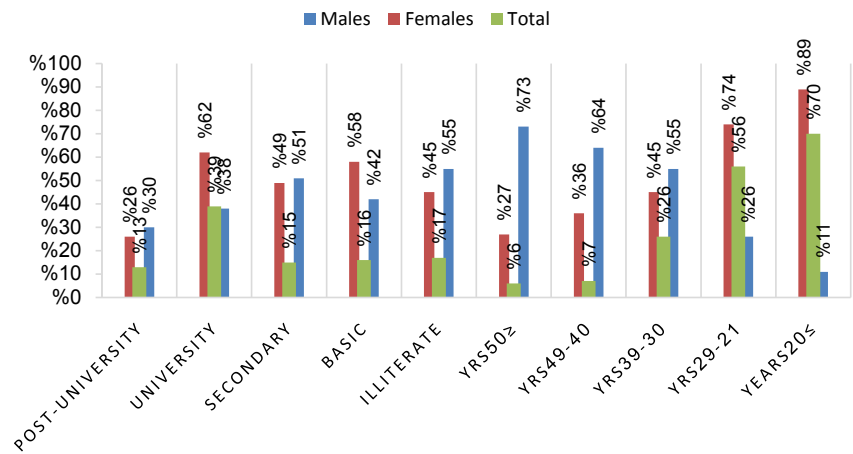


Figure 1. Description of the study population by gender, age, and education.

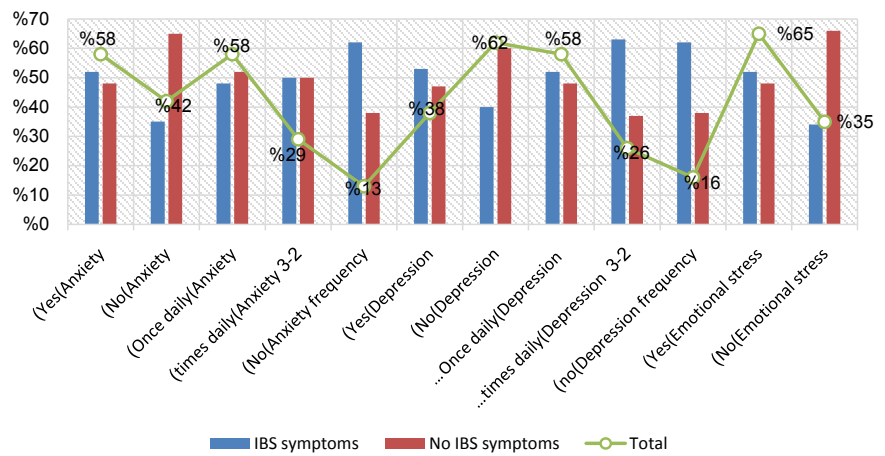


Figure 2. IBS symptoms by psychological causes.

Table 2. Distribution of the study population by IBS symptoms and psychological causes.

Variable	IBS symptoms	No IBS symptoms	Total
Anxiety			
Yes	283	258	541
No	129	236	365
Total	412	494	906
Anxiety frequency			
Once daily	164	159	343
2 - 3 times daily	88	86	174
No	48	29	77
Total	320	274	594
Depression			
Yes	177	160	337
No	223	329	552
Total	400	489	889

Continued

<i>Depression frequency</i>			
Once daily	116	115	223
2 - 3 times a day	62	37	99
no	39	24	63
Total	217	176	393
<i>Emotional stress</i>			
Yes	310	287	597
No	108	211	319
Total	418	498	916

Depression was indicated by 337 participants of whom 177 (52.5%) were found with IBS symptoms. The risk of depression as a risk for IBS was statistically significant. The RR (95% CI) = 1.3001 (1.1264 to 1.5006), $P = 0.0003$. Most patients experienced depression once daily 116/178 (65%) and the remaining 35% reported depression 2 to 3 times daily, as indicated in **Table 2, Figure 2**.

Emotional stress was stated by 597 participants of whom 310 (52%) were found with IBS symptoms. The risk of emotional stress as a risk for IBS was statistically significant. The relative risk and 95% confidence interval (95% CI) = RR (95% CI) = 1.5337 (1.2918 to 1.8211), $P < 0.0001$, as indicated in **Table 2, Figure 2**.

IBS symptoms were identified in 96/167 (57.5%), 45/81 (55.6%), 94/261 (36%), 144/328 (44%), 21/36 (58.3%) and 17/41 (41.5%) of the jobless, employers, self-employed, governmental jobs, students, and business, respectively, as indicated in **Table 3, Figure 3**.

With regard to the working hours, the majority of IBS symptoms were encountered among those working 6 - 8 hours/day followed by 4 - 6 hours, constituting 353/728 (48.5%) and 212/728 (29%), in this order. However, within the entire working hour's groups, the proportions of IBS increased with increasing of working hours, but it didn't show any statistically significant differences, as shown in **Table 3, Figure 3**.

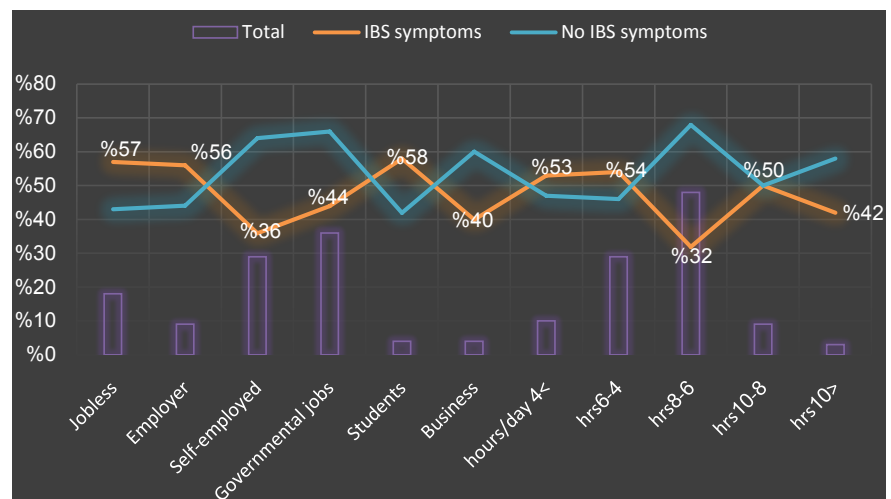
4. Discussion

The burden of IBS is increasing in Saudi Arabia amongst different population settings, which might be associated with daily life tension. The prevalence of anxiety and depression and other psychological factors represent major IBS predictors in line with socioeconomic characteristics of the Saudi community.

The present study highlighted the roles of anxiety, depression, working hours, and occupation in the etiology of IBS. The study included diverse population settings in term of age, sex, education, and occupation. IBS symptoms were identified in 46% of the study population of whom (38%) were males and (62%) were females. Several published data indicated that IBS is a significant problem

Table 3. Distribution of the study population by IBS symptoms, occupation and working hours.

Variable	IBS symptoms	No IBS symptoms	Total
Occupation			
Jobless	96	71	167
Employer	45	36	81
Self-employed	94	167	261
Governmental jobs	144	184	328
Students	21	15	36
Business	17	24	41
Total	417	497	914
Working hours			
<4 hours/day	40	35	75
4 - 6	115	97	212
6 - 8	114	239	353
8 - 10	32	32	64
>10 hours	10	11	24
Total	311	414	728

**Figure 3.** IBS symptoms by occupation and working hours.

among females compared to males. Female sex predisposes children and adolescents to develop IBS [9]. The reported prevalence rates of IBS among Saudi medical students and nurses were ranging from 14.4% [10] to 31.8% [11]. However, the high percentage of IBS in the present series may be attributed to the fact that, the present study considered any IBS related symptoms.

The findings of the present study showed that anxiety a strong risk for IBS. The RR (95% CI) = 1.4801 (1.2608 to 1.7376), $P < 0.0001$. Moreover, depression was also statistically significant risk associated with IBS. The RR (95% CI) =

1.3001 (1.1264 to 1.5006), $P = 0.0003$. In a study from Saudi Arabia to determine the prevalence, severity, and predictors of IBS among nurses, found that morbid anxiety is one of the major predictors of IBS [10]. A study from Saudi Arabia reported a high prevalence of IBS existing among medical students and interns. Female gender, morbid anxiety, living in the school dormitory, emotional stress, and higher educational level (grade) were the predictors of IBS [11]. Another study investigated medical students provided evidence that as medical students of the higher year of their under graduation were having a higher level of anxiety which leads to IBS [12]. In a systemic review involved 16 studies related to IBS, the prevalence of IBS among medical students ranged from 9.3% to 35.5%. The relatively high prevalence among medical students may be attributed to their special stressful learning environment. Some studies found that female gender, family history of IBS, psychiatric stress, anxiety, depression, infections, dietary factors, and sleep disorders were associated with IBS [13]. Moreover, in the present study, the frequencies of anxiety and depression were relatively lower (once per day), which may indicate relatively moderate IBS symptoms.

The risk of emotional stress as a risk for IBS was statistically significant. The relative risk and 95% confidence interval (95% CI) = RR (95% CI) = 1.5337 (1.2918 to 1.8211), $P < 0.0001$. Our emotional situation can have several magnitudes on our somatic health and well-being. Negative emotions such as anxiety play a chief role in gut functioning because of the bidirectional communications between the gut and brain, known as, the brain-gut axis [14]. In a study examined the responses to emotional stress in IBS patients, it delivers evidence that there is a definite change in stress responses in IBS patients, but no total overstated stress response [15]. The biopsychosocial model applied to the understanding of IBS pathophysiology proposed that psychosocial factors, interacting with peripheral/central neuroendocrine and immune alterations, may encourage symptoms of IBS, modify symptom severity, influence illness experience and quality of life, and disturbing outcome. An earlier study has proposed that negative emotions and attitudes have harmful effects on health, and a number of behavioral and biological mechanisms could trigger these links [16]. However, the prevalence of psychiatric conditions in IBS patients differs in diverse cultures [17].

In the present study, IBS symptoms were frequently seen in all occupational settings. However, some of these occupations are stressful. Stress has been involved as contributing to the initiation and exacerbation of bowel and discomfort symptoms in patients with IBS [18]. The Pressure Management Indicator (PMI) is a validated questionnaire to analyze all aspects of occupational stress—a model encompassing causes of stress, the mean of coping, the personality, and the consequential effects of the communication between these 3 components. The level of occupational stress was higher in IBS patients compared to healthy subjects (socio-professional stress effects were lower in IBS patients) and associated with IL-6 levels [19]. IBS was more common in healthcare professionals than in the control group. Healthcare workers are more disposed to IBS because

of their stressful working environment [20]. Well-being at work has been revealed to be predisposed by job features and personal variances in coping styles. Workplace anxieties, intrinsic and extrinsic effort, and negative coping and attributional behaviors were connected to high levels of depression and anxiety and low job satisfaction [21].

In the present study, higher proportions of IBS symptoms were observed among those with prolonged working hours or those with shorter working hours. There is a lack of data regarding this issue, which can be an aspect for future research.

The limitation of the present study includes its cross sectional setting as well as utility of only parts of the IBS related risk factors.

5. Conclusion

IBS and IBS related symptoms are prevalent in Northern Saudi Arabia. IBS symptoms are significantly associated with anxiety, depression and to a lesser extent may be linked to occupation and daily working hours. More studies in this context are rendered important to provide sufficient evidence for intervention and control.

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Conflicts of Interest

The author declares no conflicts of interest regarding the publication of this paper.

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