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PREVALENCE OF IRRITABLE BOWEL SYNDROME AMONG WORKERS IN PRIMARY HEALTH CARE CENTERS

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ABSTRACT

Background: Irritable Bowel Syndrome (IBS) is a common functional gastrointestinal disorder, with prevalence in Western countries ranging between 3–20%. Despite its high global burden, limited data are available on the prevalence of IBS in Iraq. **Objective:** This study aimed to determine the prevalence of IBS among a sample of Iraqi adults and to explore potential associated demographic and psychosocial factors. **Methods:** A cross-sectional study was conducted between December 1, 2011, and July 30, 2012, involving 387 employees (213 males, 174 females) from three primary health care centers in Baghdad. Participants, aged 18–61 years, were interviewed using a structured questionnaire based on the Rome III diagnostic criteria for IBS. **Results:** The overall prevalence of IBS was found to be 12.6%. Females showed a significantly higher prevalence compared to males (16.67% vs. 9.39%, $p < 0.05$). No significant associations were observed between IBS and other demographic variables such as age, educational level, occupation, or marital status. Emotional stress was identified as the most common precipitating factor, reported by 65.3% of IBS cases. A positive family history of IBS was present in 48.9% of affected individuals. Despite symptom burden, only 26.5% of patients reported that IBS significantly affected their daily activities. **Conclusion:** IBS is prevalent among Iraqi adults, with a rate of 12.6% in the studied population. Female gender was the only factor significantly associated with higher prevalence. Further large-scale national studies are recommended to establish more comprehensive epidemiological data on IBS in Iraq.

KEYWORDS: Prevalence, Irritable, Bowel, Syndrome, primary, health, care centers.

INTRODUCTION

Irritable Bowel Syndrome (IBS) is a widespread functional gastrointestinal disorder commonly encountered in clinical practice.[1] It is a chronic and often episodic condition characterized by recurrent abdominal pain or discomfort without any identifiable structural or biochemical abnormalities. This pain is typically associated with altered bowel habits, such as diarrhea, constipation, or a combination of both. Additional symptoms often include bloating, flatulence, urgency, and a sensation of incomplete evacuation.[2] Clinically, IBS is categorized into three subtypes: diarrhea-predominant IBS (IBS-D), constipation-predominant IBS (IBS-C), and mixed IBS (IBS-A), where patients alternate between diarrhea and constipation.[3] The global prevalence of IBS ranges from 3% to 20%, depending on diagnostic criteria and population studied. Despite its relatively high prevalence, only about 25% of those affected seek medical attention, making it a largely underdiagnosed condition.[4] Epidemiological data suggest that IBS is more common in Western countries (around 10%) compared to some Asian countries (around 5%).[5] However, this is not consistent across all studies. For instance, research in Europe and North America using the Rome II criteria reported prevalence rates between 10–15%, and up to 20% in the United Kingdom. In contrast, rates in Asia vary from 5.7% in South China to 8.6% in Singapore, 10.2% in southeastern Turkey, with data from Saudi Arabia still lacking.[6] The etiology of IBS remains incompletely understood. Proposed mechanisms include psychological distress, post-infectious changes, abnormal gut motility, altered gut-brain interaction, and visceral hypersensitivity—the latter being particularly implicated in the generation of pain and altered bowel habits.[7] IBS most frequently presents in early adulthood. Among women, symptoms typically begin between 25–35 years, whereas men often

exhibit a bimodal age distribution, peaking at around 30 and again at 50 years.[8] Female predominance is evident, with a reported female-to-male ratio of approximately 1.8:1 and prevalence rates of 7.4% in females and 5% in males.[8] IBS also imposes a substantial economic burden on healthcare systems. Affected individuals often undergo unnecessary investigations, consultations, and even surgeries. One community-based study estimated annual healthcare costs at $742 per IBS patient, compared to $429 for unaffected individuals. Moreover, IBS contributes significantly to work absenteeism and decreased quality of life.[9] This study aims to assess the prevalence of IBS among a sample of Iraqi adults in Baghdad, investigate potential risk factors, evaluate its impact on daily functioning and sleep, and identify common precipitating factors and treatment patterns.

Method

A cross-sectional study was conducted over a period extending from December 1, 2011, to July 30, 2012, targeting healthcare workers employed at three primary health care centers in Baghdad: Al-Amiriya, Al-Jihad, and Al-Salaam. The total study population consisted of 387 participants, including 213 males (55.03%) and 174 females (44.97%), aged 18 years and above. The participants included a range of occupations such as physicians (including dentists and pharmacists), medical staff, administrative personnel, technicians, guards, and general workers. Data collection was carried out through face-to-face interviews using a structured questionnaire developed by the investigator. The questionnaire comprised three sections. Part one collected demographic and general health information including age, sex, education, marital status, smoking status, chronic medical conditions, and history of surgeries. Part two was based on the Rome III diagnostic criteria for Irritable Bowel Syndrome (IBS), which require that abdominal discomfort or pain occur at least three days per month over the previous three months, with symptom onset at least six months prior. Diagnosis also required at least two of the following: improvement with defecation, change in stool frequency, or change in stool form.[10] Supporting symptoms such as bloating, urgency, straining, mucus passage, and sensation of incomplete evacuation were also recorded.[11] Part three assessed health-seeking behavior, medication use, possible triggering factors, family history, and impact of IBS on sleep and daily functioning. Sleep disturbance was defined by difficulty initiating or maintaining sleep, early morning awakening, or non-restorative sleep, potentially requiring sleep aids.[12] Subjects were subclassified into constipation-predominant (IBS-C), diarrhea-predominant (IBS-D), or alternating-type (IBS-A), based on their symptom patterns.[13] Participants with known organic gastrointestinal diseases such as inflammatory bowel disease or colorectal cancer were excluded to avoid diagnostic overlap.[14] Data were analyzed using SPSS version 15.0. Associations were evaluated using the Chi-square test, and statistical significance was set at a p-value ≤ 0.05.

RESULTS

The study included 387 participants, with 213 males (55.03%) and 174 females (44.96%). The majority (41.8%) were aged 18–29 years, with a mean age of 33.2 ± 9.32 years. Among those diagnosed with IBS, the mean age was 32.9 ± 9.79 years. A total of 49 individuals met the Rome III criteria for IBS. The overall prevalence of IBS in the study population was 12.7%. as in table 1.

Table 1: Sociodemographic characteristics of study population.

Subject characteristics		No (n=387)	%
Sex	Male	213	55.0
	Female	174	44.9
Age(year)	18-29	162	41.8
	30-39	133	34.3
	40-49	71	18.3
	=>50	21	5.4
Occupation	Doctors	88	22.7
	Medical staff	107	27.6
	Office worker	78	20.1
	Technician	33	8.5
	Worker	47	12.1
	Guard	34	8.7
Marital status	Single	76	19.6
	Married	311	80.4
Education (year)	Nil	24	6.2
	1-6	44	11.4
	7-12	90	23.2
	>12	229	59.2
IBS	IBS	49	12.7%
	Not IBS	338	87

This study found a significantly higher prevalence of IBS in females (16.67%) compared to males (9.4%) with a female-to-male ratio of 1.8:1 (P = 0.032). IBS prevalence was highest in individuals aged ≥50 years (19.0%), though age was not a significant factor (P = 0.841). Educational level showed no significant association with IBS, despite the highest prevalence in illiterate participants (25%, P = 0.315). Occupation was also not significantly related (P = 0.640), though workers had the highest IBS rate (19.1%). Marital status showed no significant link (P = 0.341), but IBS was more common among married individuals (13.6%). Smoking was not significantly associated with IBS (P = 0.850), though prevalence was slightly higher in smokers (13.1%). As in table 2.

Table 2: IBS Distribution by Variables.

Variable	IBS n (%)	Non-IBS n (%)	Total	P value
Gender (Male)	20 (9.4%)	193 (90.6%)	213	0.032*
Gender (Female)	29 (16.6%)	145 (83.4%)	174	
Age 18-29	20 (12.3%)	142 (87.6%)	162	0.841
Age 30-39	16 (12.0%)	117 (87.9%)	133	
Age 40-49	9 (12.6%)	62 (87.3%)	71	
Age ≥50	4 (19.0%)	17 (80.9%)	21	
Education: Nil	6 (25.0%)	18 (75.0%)	24	0.315
Education: 1-6	5 (11.3%)	39 (88.6%)	44	
Education: 7-12	11 (12.3%)	79 (87.7%)	90	
Education: >12	27 (11.7%)	202 (88.2%)	229	
Occupation: Doctor	9 (10.2%)	79 (89.7%)	88	0.640
Occupation: Medical staff	12 (11.2%)	95 (88.7%)	107	
Occupation: Office worker	12 (15.3%)	66 (84.7%)	78	
Occupation: Technician	3 (9.0%)	30 (91.0%)	33	
Occupation: Worker	9 (19.1%)	38 (80.9%)	47	
Occupation: Guard	4 (11.7%)	30 (88.3%)	34	
Marital: Married	38 (13.6%)	240 (86.3%)	278	0.341
Marital: Unmarried	11 (10.0%)	98 (90.0%)	109	
Smoker	15 (13.1%)	99 (86.9%)	114	0.850
Non-smoker	34 (12.4%)	239 (87.6%)	273	

Table 3, 4 shows that there was no significant association in terms of concurrent medical problems &past surgeries between IBS sufferers and those without IBS except for hypertension (P=0.014) and appendectomy (P=0.002) which were significant.

Table 3: Relationship of IBS and concurrent medical problems.

Medical problems		IBS (n=49)		Not (n=338)		total		P value
		No.	%	No.	%	No.	%	
Hypertension	Yes	5	33.3	10	66.6	15	100	0.014*
	No	44	11.8	328	88.2	372	100	
Diabetes mellitus	Yes	4	18.1	18	81.8	22	100	0.423
	No	45	12.3	320	87.6	365	100	
Coronary heart diseases	Yes	1	16.6	5	83.3	6	100	0.766
	No	48	12.6	333	87.3	381	100	
Asthma	Yes	3	15	17	85	20	100	0.747
	No	46	12.5	321	87.5	367	100	
Peptic ulcer	Yes	1	8.3	11	91.7	12	100	0.647
	No	48	12.8	327	87.2	375	100	
Depression	Yes	2	13.3	13	86.7	15	100	0.937
	No	47	12.6	325	87.4	372	100	

Table 4: Relationship of IBS with Past surgeries.

Past surgeries		IBS (n=49)		Not (n=338)		Total	P value
		No.	%	No.	%	No.	
Appendicectomy	Yes	3	60	2	40	5	0.002*
	No	46	12.0	336	87.9	382	
Cholecystectomy	Yes	1	33.3	2	66.6	3	0.280
	No	48	12.5	336	87.5	384	
Ovarian cyst(females)	Yes	1	25	3	75	4	0.651
	No	28	16.4	142	83.6	170	
Hysterectomy(females)	Yes	1	16.6	5	83.4	6	-
	No	28	16.6	140	83.4	168	
Inguinal hernia	Yes	1	20	4	80	5	0.619
	No	48	12.5	334	87.5	382	
Haemorrhoidectomy	Yes	2	25.0	6	75.0	8	0.289
	No	47	12.4	332	87.6	379	

Among IBS patients, 48.9% reported a positive family history of the condition (50% of males and 48.2% of females), though this was not statistically significant (P = 0.906). IBS subtypes revealed constipation-predominant IBS (40.8%) as the most common, followed by alternating type (38.7%) and diarrhea-predominant IBS (20.4%), with no significant gender difference (P = 0.520). Only 32.6% of patients had consulted a physician, with females being more likely to seek medical advice than males (41.3% vs. 20%, P = 0.117). Regarding treatment, 36.7% used prescribed medications and 32.6% used over-the-counter drugs; females more frequently used OTC and alternative therapies than males, but the differences were not significant (P = 0.100). About 26.5% of IBS patients reported that their symptoms negatively affected their daily activities, with no significant gender-related difference (P = 0.648). Lastly, only 10.2% reported sleep disturbances linked to IBS, also without significant gender disparity (P = 0.357). as in table 5.

Table 5: IBS Patients: (Family History, Subtypes, Consultation, Medications, Impact, and Sleep).

Variable	Category	Male n (%)	Female n (%)	Total n (%)	P value
Family History of IBS	**Yes**	10 (50%)	14 (48.2%)	24 (48.9%)	0.906
Family History of IBS	**No**	10 (50%)	15 (51.7%)	25 (51.0%)	
IBS Subtype	**Constipation Predominant**	10 (50%)	10 (34.5%)	20 (40.8%)	0.520
IBS Subtype	**Diarrhea Predominant**	3 (15%)	7 (24%)	10 (20.4%)	
IBS Subtype	**Alternating Type**	7 (35%)	12 (41.4%)	19 (38.7%)	
Physician Consultation	**Consulted**	4 (20%)	12 (41.3%)	16 (32.6%)	0.117
Physician Consultation	**Did Not Consult**	16 (80%)	17 (58.6%)	33 (67.3%)	
Medication Used	**Prescribed Drugs**	6 (30%)	12 (41.4%)	18 (36.7%)	0.100
Medication Used	**Over the Counter**	5 (25%)	11 (37.9%)	16 (32.6%)	
Medication Used	**Alternative Therapies**	2 (10%)	4 (13.7%)	6 (12.2%)	
Medication Used	**Never Used Anything**	7 (35%)	2 (6.8%)	9 (18.4%)	
Impact on Daily Activities	**Yes**	6 (30%)	7 (24.1%)	13 (26.5%)	0.648
Impact on Daily Activities	**No**	14 (70%)	22 (75.9%)	36 (73.5%)	
Sleep Disturbance	**Yes**	3 (15%)	2 (6.8%)	5 (10.2%)	0.357
Sleep Disturbance	**No**	17 (85%)	27 (93.1%)	44 (89.7%)	

A total of 65.3% of patients with IBS reported that their symptoms triggered by emotional stress it was the most triggering factor followed by ingestion of a specific foods 44.8 % (e.g. pastries, spicy foods, pickles, high fat meals, beans, milk & dairy products), There was no significant difference between genders regarding IBS precipitating factors, as shown in table 6.

Table 6: Distribution of IBS precipitating factors in relation to patients' sex.

Precipitating factors	Emotional stress		Ingestion of specific food		Spntaneous		Other factors		Total
	No.	%	No.	%	No.	%	No.	%	
Male(no.=20)	**13**	**65**	**12**	**60**	**1**	**5**	**0**	**0**	**26**
Female(no.=29)	**19**	**65.5**	**10**	**34.4**	**3**	**10.3**	**1**	**3.4**	**33**
Total	**32**	**65.3**	**22**	**44.8**	**4**	**8.1**	**1**	**2**	**59**
P-value	**0.970**		**0.078**		**0.502**				
Note: the patient may have more than one factor									

DISCUSSION

Irritable Bowel Syndrome (IBS) is a chronic, episodic functional gastrointestinal disorder and represents one of the most frequent diagnoses in primary care and gastroenterology practices.[15] Despite being non-life-threatening, IBS significantly impairs quality of life and contributes to social and occupational limitations for sufferers.[16] Patients often experience extra-intestinal symptoms such as back pain, headache, dyspareunia, and urinary complaints, leading to absenteeism, job changes, and even premature retirement, resulting in substantial healthcare and economic burdens.[17] The global prevalence of IBS ranges between 3% and 20%, but this variation may reflect differences in diagnostic criteria rather than actual differences in prevalence.[18,19] The Rome III criteria, used in this study, aim to improve diagnostic specificity. Our study found a 12.7% prevalence rate of IBS among healthcare workers in

Baghdad, aligning closely with findings from studies in Canada (12.1%)[20], Southern Europe (13.6%).[21] This suggests that IBS is similarly prevalent in Iraq despite cultural and lifestyle differences. However, some Asian studies reported lower rates, such as China (5.7%)[22], and France (4.7%)[23], while other like Taiwan (22.1%)[24] reported much higher rates, underscoring the influence of regional diagnostic practices and sociocultural factors. A significant gender disparity was observed, with females more commonly affected (16.6%) compared to males (9.3%), yielding a female-to-male ratio of 1.8:1. This pattern is consistent with Western studies[25], including data from the USA and Europe[26], where female predominance may be attributed to hormonal fluctuations, particularly during menstruation[27], as well as sociocultural and behavioral differences in health-seeking patterns. However, many Asian studies such as those from India did not observe such gender differences.[28] No statistically significant association was observed between age and IBS, although the highest prevalence (19%) occurred in those aged ≥50. While some literature supports IBS being more common in young adults due to stress-related factors[29], other studies have also shown no age correlation.[30,31] Our findings support the latter, suggesting IBS may persist or even increase with age. Regarding education, IBS prevalence was inversely related to educational level, with the highest rate among illiterate individuals (25%). This may reflect socioeconomic disparities, as lower socioeconomic status is linked to higher rates of infectious gastroenteritis, a known risk factor for post-infectious IBS.[32,33] Although not statistically significant, IBS prevalence was higher among married individuals (13.6%) and smokers (13.1%)—findings echoed in similar study.[34] Interestingly, a significant association was found between IBS and past appendectomy and hypertension (P = 0.002 and 0.014, respectively), suggesting a possible link between certain surgical or medical histories and IBS, as noted by Hasler and Schoenfeld.[35] In terms of IBS subtypes, constipation-predominant IBS (40.8%) was the most common, followed by alternating (38.7%) and diarrhea-predominant types (20.4%). This differs from literature reporting diarrhea as the most common subtype[36], but aligns with findings from the Olmsted County study which showed similar rates among all subtypes.[37] Emotional stress was identified as the leading precipitating factor (65.3%), followed by food triggers (44.8%), in agreement with research showing stress plays a central role in IBS pathophysiology by altering gut-brain signaling and motility.[38] Despite the distress caused by symptoms, only 32.6% of patients sought medical advice, with females more likely to consult—a trend supported by previous studies.[39] Medical care-seeking is typically associated with symptom severity and female sex.[40] Medication usage patterns mirrored those in Western populations, with 32.6% using OTC drugs and 12.2% using alternative therapies.[41] Female patients were more likely to self-medicate or use non-prescription remedies. Daily activity impairment was reported by 26.5% of patients, and 10.2% reported sleep disturbances, though these rates are lower than those reported in Western studies.[42,43] Lastly, familial aggregation was reported in 48.9% of IBS patients. Though twin studies suggest a genetic component, definitive genetic markers remain elusive.[44,45] These findings reinforce the multifactorial nature of IBS and the need for culturally sensitive diagnostic and management approaches.

CONCLUSION

The prevalence of IBS was 12.6%, comparable to that reported in Western nations. IBS is more prevalent in females, having a female to male ratio of 1.8:1. Emotional stress is a significant precipitant of IBS. Family history was a significant risk factor. Individuals with lower educational attainment in certain occupations may be more susceptible to developing IBS, although tobacco smoking and marital status do not significantly influence the onset of the condition.

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