

ORIGINAL ARTICLE

# Impact of Demographic and Lifestyle Factors on Irritable Bowel Syndrome from Basra

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## Abstract

**Background** Irritable Bowel Syndrome (IBS) is a common functional gastrointestinal disorder affecting quality of life. Despite its prevalence, its pathophysiology remains unclear, necessitating further investigation into contributing factors.

**Objective** The objective of this study is to identify the demographic characteristics and lifestyle factors associated with IBS in a population attending Basra Hospital. This will enhance our understanding of the condition and inform potential management strategies.

**Materials and Methods** A cross-sectional study was conducted involving patients diagnosed with IBS at Al-Sadr Teaching Hospital and Al-Fayhaa Teaching Hospital in Basra/Iraq. Participants completed a structured questionnaire assessing demographic information, lifestyle habits (dietary patterns, smoking, and exercise), and psychological stress. Data were analyzed using statistical analysis performed using Microsoft Office Excel 2013 and GraphPad Prism 9.2.0 software to determine correlations between factors and IBS prevalence.

**Results** Preliminary findings indicate that women are disproportionately affected by IBS compared to men, with significant associations observed between IBS symptoms and dietary habits, particularly the consumption of high-fat and low-fiber foods. Psychological stress was also identified as a critical factor influencing symptom severity.

**Conclusion** This study highlights the importance of demographic and lifestyle factors in understanding IBS. Targeting these elements may lead to improved management strategies and enhanced patient outcomes. Further research is necessary to explore the complex interplay of these factors in the pathophysiology of IBS.

**Keywords:** Irritable Bowel Syndrome (IBS); Lifestyle factors; Dietary habits; Psychological stress; Gastrointestinal disorders

## 1 Introduction

Irritable Bowel Syndrome (IBS) is a prevalent functional gastrointestinal disorder affecting 10–20% of individuals globally, with varying impacts across demographics and regions) [1, 2]. It is characterized by

a combination of symptoms such as abdominal pain, bloating, and changes in bowel habits, which significantly impact patients' quality of life [3, 4]. Although IBS does not cause severe morbidity or mortality, it remains a chronic, relapsing condition that leads to

high healthcare utilization and often requires long-term management [3, 5–7].

The etiology of IBS is multifactorial, involving a complex interplay of genetic predispositions, environmental factors, and psychological stressors [8, 9]. Recent research has explored how altered gut microbiota, immune activation, and cytokine imbalance might contribute to IBS pathogenesis [10–12]. These studies suggest that inflammatory and immune responses in the gut may exacerbate symptoms, especially in the presence of stress or dietary triggers, making IBS a disorder influenced by both internal and external factors [13–15].

Gender differences in IBS prevalence have been widely documented, with a higher incidence reported in females. Hormonal factors, particularly estrogen, are believed to influence gastrointestinal motility and visceral sensitivity, although evidence regarding the extent of their role remains inconclusive [16, 17]. Additionally, age appears to play a role, with IBS symptoms often peaking in middle age, possibly due to the cumulative effects of lifestyle, dietary habits, and stress [18]. However, lifestyle factors such as smoking, diet, and family history also contribute to IBS risk, with dietary components like legumes and spices being implicated in symptom exacerbation for some individuals [19, 20]. This study aims to explore the prevalence and characteristics of IBS in patients attending Basra Hospital, analyzing the influence of demographic variables (age and gender), lifestyle factors (diet and smoking), family history, and psychological stress on IBS occurrence. By examining these variables, this research seeks to contribute to the understanding of IBS’s multifaceted nature and to identify potential risk factors relevant to the Iraqi population. The findings may aid in developing targeted strategies for managing and potentially mitigating IBS symptoms, enhancing patient outcomes in this region.

## 2 Materials and methods

### 2.1 Sample collection

The study was conducted on 109 people (64 patients and 45 healthy control) aged between 15 and 74 years who visited Al-Sadr Teaching Hospital and Al-Fayhaa Teaching Hospital in Basra/Iraq during the period between December 2023 and May 2024. All patients’ information involved in the study was recorded in questionnaire form, including age, smoking, family history, diet, and psychological pressures.

### 2.2 Exclusion criteria

All other diseases that can have similar symptoms to IBS, like (inflammatory bowel disease (IBD), celiac

disease, and Crohn’s disease). All patients have autoimmune disease.

## 3 Statistical analysis

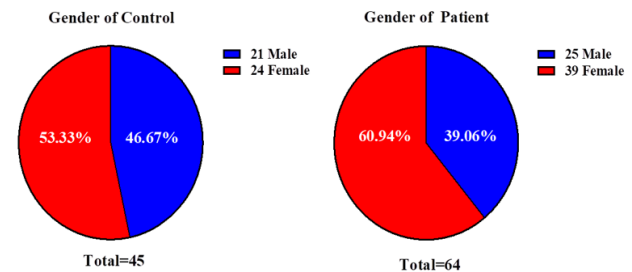
Microsoft Office Excel 2013 and GraphPad Prism 9.2.0 were utilized for data collection, analysis, and presentation. Categorical data were expressed as numbers, while numerical data were represented as mean ± standard deviation (SD). A one-way ANOVA was used to compare mean values across different groups for normally distributed variables. A P-value of <0.05 was considered statistically significant.

## 4 Results

Comparison between the patient IBS and control group with sex The patients with irritable bowel syndrome (25 male and 39 female) were infected in the current results. The female rate (60.94%) was higher than the male rate (39.06%) without any significance, as shown in Table 1.

**Table 1:** Comparison between the patient IBS and control group with sex.

Gender	Category		Total	P-value*
	Patient	Control		
Male	25	21	46	0.4287  ns
	39.06%	46.67%	42.2%	
Female	39	24	63	
	60.94%	53.33%	57.8%	
Total	64	45	109	
	100.0%	100.0%	100.0%	



**Figure 1:** Pie chart showing Gender distribution in the control group and patients with irritable bowel syndrome in the current study.

### 4.1 Comparison between IBS patients and control with different ages

Table 2 study compares the distribution of IBS patients and controls across different age groups. The

results show that the highest percentage of IBS patients within the 35-44 age group (26.56%) while the lowest percentage in the  $\geq 55$  age group (15.63%) with significant differences ( $p=0.0132$ ).

**Table 2:** Comparison between IBS patients and control with different ages.

Age groups (Year)	Category		Total	P-value*
	Patient	Control		
15-24	11	19	30	0.0132*
	17.19%	42.22%	59.41%	
25-34	15	10	25	
	23.44%	22.22%	45.66%	
35-44	17	12	29	
	26.56%	26.67%	53.23%	
45-54	11	2	13	
	17.19%	4.44%	21.63%	
55 or older	10	2	12	
	15.63%	4.44%	20.07%	
Total	64	45	109	
	100.0%	100.0%	100.0%	

\* Pearson Chi-Square

## 4.2 Comparison between IBS patients and control with different ages and sex

Table 3 shows the comparison between IBS patients and controls across different age groups and gender. In the control group, the gender distribution is more balanced, with 53.33% females and 46.67% males, indicating that the higher prevalence in females is primarily observed in IBS patients, not in the general population. The highest prevalence of IBS is found in the 35-44 age group (26.56%), with a nearly equal distribution between males and females. Age younger groups (15-24), the control group has a higher proportion (42.22%) compared to the patient group (17.19%), while in the 45-54 and 55+ age groups, the prevalence of IBS patients increases significantly, particularly among females, males in these age groups show relatively lower rates of IBS.

## 4.3 Comparison between IBS patients and control with smoking habit

Table 4 shows that patients with non-smoking have a high rate (79.68%) while patients with smoking have (20.31%) with a non-significant difference ( $p=0.5276$ ).

**Table 3:** Comparison between IBS patients and control with different ages and sex.

Age	Gender	Patient	Control	Total
15-24	Male	5	8	13
	%	7.81%	17.78%	25.59%
	Female	6	11	17
	%	9.38%	24.44%	33.82%
25-34	Male	5	5	10
	%	7.81%	11.11%	18.92%
	Female	10	5	15
	%	15.63%	11.11%	26.74%
35-44	Male	8	6	14
	%	12.50%	13.33%	25.83%
	Female	9	6	15
	%	14.06%	13.33%	27.40%
45-54	Male	5	1	6
	%	7.81%	2.22%	10.03%
	Female	6	1	7
	%	9.38%	2.22%	0.115972
55 or older	Male	2	1	3
	%	3.13%	2.22%	5.35%
	Female	8	1	9
	%	12.50%	2.22%	14.72%
Total	Male	25	21	46
	%	39.06%	46.67%	42.20%
	Female	39	24	63
	%	60.94%	53.33%	57.80%
	Control	64	45	109
	Patient	100.00%	100.00%	100.00%

**Table 4:** Comparison between IBS patients and control with smoking habit.

Characteristic	Control	Patient	Total	P-value*
Smokers	7	13	20	0.5276 ns
%	15.21%	20.31%	18.34%	
Nonsmokers	38	51	89	
%	84.44%	79.68%	81.65%	
Total	45	64	109	
	100.00%	100.00%	100%	

\* Pearson Chi-Square

## 4.4 Comparison between IBS patients with family history

Table 5 shows that patients with non-family history have a higher rate (82.81%) than the patients with a family history (17.18%), with the relation having a significant difference.

**Table 5:** Comparison between IBS patients with family history.

Characteristic	Control	Patient	Total	P value*
Family history	zero	11	11	0.0034 **
%	0.00%	17.18%	10.09%	
No- family history	45	53	98	
%	100.00%	82.81%	89.90%	
Total	45	64	109	
	100.00%	100.00%	100.00%	

\* Pearson Chi-Square

### 4.5 Comparison between the diet of IBS

The study shows a comparison of different types of diets among IBS patients, with the highest rate of IBS occurrence seen in patients consuming a legume-based diet (46.87%). In contrast, the vegetable-based diet had the lowest rate of IBS occurrence, with only 4.68% of patients (3 out of 64) consuming primarily vegetables, as shows in Table 6.

**Table 6:** Comparison of diets of IBS.

Type of diet	No. patient	%
Spices	25	39.06%
Vegetable	3	4.68%
Legumes	30	46.87%
Fats	6	9.37%

### 4.6 Comparison between IBS patient and control with psychological stress

The comparison between IBS patients and the control group with psychological stress reveals a significant association. The results show that 100% of IBS patients (64 out of 64) reported psychological stress, while only 35.56% of the control group (16 out of 45) experienced psychological stress. With a (p=<0.0001) indicating a highly significant difference between the two groups, as shows in Table 7

**Table 7:** Comparison between IBS patients and control with psychological stress.

Characteristic	Control	Patient	Total	P value*
yes	16	64	80	<0.0001 ****
%	35.56%	100%	73.39%	
No	29	0	29	
%	64.44%	0%	26.60%	
total	45	64	109	
%	100%	100%	100%	

\* Pearson Chi-Square

## 5 Discussion

Irritable Bowel Syndrome (IBS) is a prevalent functional gastrointestinal disorder with a global prevalence of approximately 11% [21]. The role of inflammatory cytokines in IBS pathogenesis is increasingly recognized, with an imbalance between pro-inflammatory and anti-inflammatory cytokines contributing to symptom severity [22].

In this study, IBS was more prevalent in females (60.94%), but the gender difference was not statistically significant. While hormonal influences such as estrogen and progesterone have been suggested as factors in IBS susceptibility, their role remains inconclusive in small-scale studies. This finding aligns with studies by Lackner et al. [23] and El-Salhy et al. [24], which found no significant gender differences. However, Heitkemper et al. [25] reported a significant gender effect, attributing IBS prevalence in women to hormonal fluctuations.

Age was a significant factor, with the highest IBS prevalence in the 35–44 age group (26.56%) and the lowest in those ≥55 years (15.63%) (p = 0.0132). These findings are consistent with studies by Patel et al. [26] and Gupta & Sharma [27], which indicate that IBS peaks in middle age due to stress and lifestyle factors. However, Lee et al. [28] found higher IBS prevalence in older adults, suggesting regional or environmental influences. Smoking was not significantly associated with IBS (p = 0.5276), which aligns with findings by Schmulson et al. [29] and Yarandi et al. [30]. However, other studies have reported a higher IBS risk among smokers (Limsrivilai et al. [31], Nguyen et al. [32], and Lee et al. [33]), indicating possible population differences or confounding factors.

Family history was significantly associated with IBS (p < 0.05), supporting the role of genetic predisposition. Studies by Saito et al. [34] and Simrén et al. [35] found that individuals with a family history of IBS have 2–3 times higher risk. However, Jones et al. [36] and Palsson et al. [37] suggest that environmental factors, such as diet and stress, may play a larger role than genetics.

Dietary factors play a key role in IBS prevalence. Patients consuming high-FODMAP foods (e.g., legumes) had a significantly higher IBS prevalence (46.87%), while vegetable-based diets showed a protective effect (4.68%). This supports findings by Halmos et al. [38] and Gibson et al. [39] that high-FODMAP diets exacerbate IBS symptoms. However, Mansour-Ghanaei et al. [40] found no significant link between legumes and IBS, suggesting that individual dietary tolerance varies.

Psychological stress showed the strongest association with IBS severity (p < 0.0001). IBS patients had significantly higher stress levels compared to controls,

reinforcing the role of stress in symptom exacerbation. These findings are consistent with Chitkara et al. [41] and Lackner et al. [42], who confirmed a strong correlation between psychological distress and IBS severity. However, Simrén et al. [43] found that stress sensitivity varies among IBS subtypes, indicating the need for further investigation.

This study confirms the significant impact of age, diet, family history, and psychological stress on IBS prevalence. Psychological stress emerged as the strongest predictor, while smoking showed no significant association. Future research should incorporate objective dietary assessments and stress evaluation tools to refine IBS management strategies. A multidisciplinary approach targeting stress reduction and dietary modifications may improve patient outcomes.

## 6 Conclusion

This study highlights the significant role of psychological stress, dietary habits, and age in IBS prevalence. Psychological stress was the strongest predictor of symptom severity, while high-FODMAP foods exacerbated symptoms. Although IBS was more common in women, the gender difference was not statistically significant. Smoking showed no clear association with IBS. Targeting modifiable risk factors, such as stress management and dietary adjustments, could improve IBS outcomes. A multidisciplinary approach integrating dietary interventions, psychological support, and lifestyle modifications is essential for effective management and reducing IBS-related healthcare burdens.

**Conflict of Interest:** No conflicts of interest exist between the authors and the publication of this work.

**Ethical consideration:** The ethical committee approved the study at Southern Technical University, Basrah, Iraq.

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