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# Assessment of Nutritional and Psychological Factors to The Occurrence of Irritable Bowel Syndrome Among Adults

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## Abstract

**Background:** Irritable Bowel Syndrome is a chronic functional gastrointestinal disorder characterized by abdominal pain associated with defecation or a change in bowel habits. It is a chronic disorder that affects 9%-23% of the population across the world. Mostly occurred as a result of nutritional and psychological imbalance, therefore, this study aimed to assess the nutritional and psychological factors contributing to the occurrence of the irritable bowel syndrome. **Methods:** A quantitative design /cross-sectional design descriptive study was conducted. Using the non-probability purposive sampling in selected places in Ranya district in Kurdistan Region from 10th November 2024 to 15th February 2025. **Results:** The majority of the participant age group 39.5% were over 40 years, and the majority of them 73.2%, were female. Additionally, most of the participants experienced abdominal discomfort 47.7%. the study found that eating beans and legumes was shown to be associated with bloating and gas among the study sample (p-value =0.03). Regarding psychological factors, about 15.06 % of participants had anxiety, which was the highest among other psychological conditions. The study found that stress and constipation among participants have a significant association, p-value=0.01. **Conclusion:** The most common symptoms were fatigue, bloating, and abdominal discomfort, but constipation was more common than other types of IBS. The nutritional and psychological status are substantially correlated with the occurrence of IBS. A multidisciplinary and interdisciplinary approach to minimize the occurrence of irritable bowel syndrome and the management of patients is highly essential.

## 1. Introduction

Irritable Bowel Syndrome (IBS) is a functional bowel disorder without any pathological reasons, and the causes of IBS are not well understood and various researches have indicated that IBS is a multifactorial illness with vulnerability to genetic factors, change in the balance of the bacterial flora in the gut, nerve sensitivity, motor abnormality in the gut, and psychological contribution such as stress [1]. IBS classified into three main types based on bowel movement patterns. IBS with Constipation (IBS-C) More than 25% of stools are hard or lumpy, and less than 25% are loose or watery IBS with Diarrhea (IBS-D) More than 25% of stools are loose or watery, and less than 25% are hard or lumpy. IBS with Mixed Bowel Habits (IBS-M) Both hard/lumpy and loose/watery stools occur more than 25% of the time [2].

Global prevalence of irritable bowel syndrome has been widely examined; it has been approximated that the disorder affects between 1.1% and 45% of the population worldwide [3]. One of the most contentious areas of research into irritable bowel syndrome pathophysiology is the contribution of dietary factors, with conflicting evidence for whether specific food components are a causative factor or potentiating factor for symptoms. despite diet being a commonly cited causative factor in symptomatology in IBS, mechanisms have remained elusive, and it has been questioned whether food intolerances are a causative factor in IBS or a secondary effect to altered gut physiology [4]. Regularity of sleep is critical to IBS because poor sleep quality of a patient can lead to worsening of symptoms that include abdominal pain, bloating, and irregular bowel movements. Research shows that poor sleep disrupts the gut-brain axis, increasing visceral hypersensitivity and altering gastrointestinal motility [5]. Water also relieves bloating and facilitates digestion by enabling proper absorption of nutrients. IBS patients should. however, be cautious with the type of water consumed as carbonated and extremely cold drinks are likely to cause gas and cramping [6].

Stress is one of the major causative factors of IBS symptoms because the brain and the intestine interact closely with one another through the gut-brain axis. Stress in the brain is capable of enhancing the sensitivity of the intestine, altering the regular movements of the bowels, and inducing inflammation, worsening IBS pain [7]. depression is closely linked with IBS because both conditions share the interaction between the brain and the gut. IBS patients experience depression, and viscera, because of the complex interaction between mental and digestive health. Depression is also responsible for changing appetite, motility of the gut, and sensitisation of the viscera, exacerbating IBS. Neurotransmitter imbalances. Low levels of serotonin, also affect mood and bowel function [8]. Anxiety is a frequent comorbidity of IBS. Anxiety is a common comorbidity of IBS and plays a major role in symptom exacerbation. The bidirectional communication provided by the gut-brain axis allows emotional distress to directly impact gastrointestinal function. Highly anxious patients develop increased gut motility, hence diarrhoea, or slowed processing, resulting in constipation.

## MATERIAL AND METHODS:

This study was conducted through applying Quantitative design / A cross-sectional descriptive design. It was carried out from healthcare facilities in the Ranya district of Kurdistan /Iraq, from the period between 10th November 2024 to 15th February 2025.

## Sample size:

The sample size (n) for this study would be calculated by using the single population proportion formula, it included z2=%95 confidence level and equal 1.96, (P) is the prevalence irritable bowel syndrome obtained in research conducted (8.9 %) [10]. (d2) is the level of precession or sampling error and equal %5 (0.05). All adults who were 18 years and older in both sexes either male and female were included and accepted to participated in the study. According to a result of calculating formula,125 patient meet inclusion criteria for participation.

$$\text{Sample size} = \frac{Z^2 * p \times (1-p)}{D^2}$$

$$\text{Sample size} = \frac{1.96^2 * 0.089\ (1-0.089)}{0.0025}$$

$$\text{Sample size} = \frac{3.8416 * 0.081079}{0.0025} = 125$$

According to this formula, essential sample size that required for this study was 125 patient who met the inclusion criteria of the study, but collect 220 patients due to strengthen the credibility of research, collecting more cases can help verify and validate initial findings before publication or presentation, it also can be genderized the findings.

## Study design:

A non- probability purposive sampling technique was used to select 125 patients who were diagnosed with irritable bowel syndrome. The data was collected by using face-to-face interviews technique. In addition, the Kurdish language was used for communication and brief introduction about objectives of the study was provided to each respondent prior to interview and explanation were given about questions, if needed. In addition, the consent was taken from the patient to participate in the study. The were required time to collect data with each sample was approximately between (10-20) minute.

## Data collection tool:

A tool for data collection was developed by the researcher to meet the objectives of the study, and it was mainly used to assessing related factors to the occurrence of the irritable bowel syndrome. The tools of data collection were constructed, modified, and developed in a questionnaire that reflected on variables measures as outcome based on the intensive review of literature and measurement tools and questionnaires used in previous related studies.

## Validity:

the face and content validity of the instrument was determined through a panel of (10) experts with average mean years of experience of 22.2 years. Based on these experts' comments and valuable suggestions, some minor additions and some items were modified to be suitable for this study and their comments and recommendations were taken into considerations. expertise's was supplied the instrument by their outlook about the appropriateness of the items of the study with some comments and opinion. Thus far the alteration is employed and the final copy of the instrument is completed and become valid to be an appropriate tool for data collection. reliability of the questionnaire was determined using internal consistency reliability, the computation of a Cronbach Alpha Correlation Coefficient was computed through the using of statistical package for social science (SPSS) software.

## Reliability and statistical data analysis:

Based on the pilot study results that were done on the 13 patients, the Cronbach Alpha test for the reliability of the questionnaire was (0.829), and the estimation was statistically good enough to be a reliable measure for this study. Statistical analysis for this study was conducted using SPSS version 26. Descriptive statistics, including means and standard deviations (SD), were used to summarize continuous variables, while frequencies and percentages (n, %) were used for categorical data. The relationship between sociodemographic characteristic and outcomes was assessed using the Chi-square test for non-parametric data.

# RESULT:

## Socio demographic characteristic

Table (1) illustrated participants in this study ranged age from 18 to 65 years, a majority age group were over 40 (39.5%). In terms of occupation most of the participant were employed (41.4%), and clarification gender distribution the majority (73.2%) were female.

**Table 1. Sociodemographic characteristics of the participants**.

| NO | Sociodemographic characteristics | | n (%) |
|---|---|---|---|
| 1 | Age (year) | Min/Max | 18/65 |
| | | Mean ± SD | 37.83 ± 13.81 |
| | | <20 | 11 (5.0%) |
| | | 21-30 | 79 (35.9%) |
| | | 31-40 | 43 (19.5%) |
| | | >40 | 87 (39.5%) |
| 2 | Gender | Male | 59 (26.8%) |
| | | Female | 161 (73.2%) |
| 3 | Occupation | Employed | 91 (41.4%) |
| | | Unemployed | 17 (7.7%) |
| | | Student | 26 (11.8%) |
| | | House wife | 86 (39.1%) |
| 4 | BMI | Min/Max | 17.24/39.82 |
| | | Mean ± SD | 26.76 ± 4.72 |
| | | Underweight | 5 (2.3%) |
| | | Normal | 82 (37.3%) |
| | | Overweight | 72 (32.7%) |
| | | Obese | 61 (27.7%) |
| 5 | Educational status | Illiterate | 41 (18.6%) |
| | | Read and write | 25 (11.4%) |
| | | Basic School | 38 (17.3%) |
| | | High School | 22 (10.0%) |
| | | Institute | 36 (16.4%) |
| | | University | 51 (23.2%) |
| | | Postgraduate | 7 (3.2%) |
| 6 | Marital state | Single | 67 (30.5%) |
| | | Married | 138 (62.7%) |
| | | Divorce | 1 (0.5%) |
| | | Widow | 14 (6.4%) |
| 7 | Residency | Urban | 144 (65.5%) |
| | | Suburban | 60 (27.3%) |
| | | Rural | 16 (7.3%) |
| 8 | Monthly income | Sufficient | 123 (55.9%) |
| | | Barely Sufficient | 63 (28.6%) |
| | | Insufficient | 34 (15.5%) |
| 9 | Smoking | Yes | 18 (8.2%) |
| | | No | 202 (91.8%) |

| | | | |
|---|---|---|---|
| **10** | **Alcoholic** | Yes | 2 (0.9%) |
| | | No | 218 (99.1%) |

Table (2) about regarding sleep patterns among participant within a 24-hour period 131 (59.5%) of the participants sleep 7 hours or less than 7 hours. daily water intake by study sample most of the participants 150 (68.2%) drink 7 glass of water or less.

**Table 2: sleep during 24 hours and water drink daily.**

| NO | Items | 7 & 7> | 8&8< |
|---|---|---|---|
| **1** | **Sleep During 24 Hours** | 131 | 89 |
| | | 59.5% | 40.5% |
| **2** | **Daily Water Drink (glass)** | 150 | 70 |
| | | 68.2% | 31.8% |

## Diagnosis and clinical symptoms of IBS

Table (3) shows majority of the study sample often experience abdominal discomfort 105 (47.7%). frequent episodes of bloating and abdominal distention were observed, with 32.7% of participants reporting this occurrence experiencing always. fatigue associated with irritable bowel symptoms was another frequently encountered issue of participants reporting 40.9% often. Additionally, the study results show that patients mostly suffer from constipation hard, lumpy stools were (10.5% always) compared to diarrhea loose watery stools were (always 3.6%) and alternating between hard and loose stools was observed (always in 2.7%).

**Table 3. Clinical symptoms and diagnosis of irritable bowel syndrome**

| No | Items | Never | Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|---|
| **1** | **Recurrent abdominal pain.** | 2 (0.9%) | 10 (4.5%) | 110 (50.0%) | 73 (33.2%) | 25 (11.4%) |
| **2** | **Recurrent abdominal discomfort.** | 1 (0.5%) | 7 (3.2%) | 79 (35.9%) | 105(47.7%) | 28 (12.7%) |
| **3** | **After toileting feel bowels have not fully emptied.** | 7 (3.2%) | 42(19.1%) | 84 (38.2%) | 67 (30.5%) | 20 (9.1%) |
| **4** | **bloating, abdominal distention.** | 1 (0.5%) | 5 (2.3%) | 62 (28.2%) | 80 (36.4%) | 72 (32.7%) |
| **5** | **abdominal pain improves after toileting.** | 2 (0.9%) | 15 (6.8%) | 93 (42.3%) | 84 (38.2%) | 26 (11.8%) |
| **6** | **notice mucus stool.** | 77 (35.0%) | 73(33.2%) | 49 (22.3%) | 15 (6.8%) | 6 (2.7%) |
| **7** | **feel a strong urgency to defecate.** | 17 (7.7%) | 51(23.2%) | 99 (45.0%) | 38(17.3%) | 15 (6.8%) |
| **8** | **seasonal variation in symptoms.** | 67 (30.5%) | 49(22.3%) | 68 (30.9%) | 26 (11.8%) | 10 (4.5%) |
| **9** | **Symptoms affect daily activity.** | 19 (8.6%) | 49(22.3%) | 82 (37.3%) | 62 (28.2%) | 8 (3.6%) |
| **10** | **fatigue with bowel** | 5 (2.3%) | 28(12.7%) | 77 (35.0%) | 90 (40.9%) | 20 (9.1%) |

| | | | | | | |
|---|---|---|---|---|---|---|
| | **symptoms.** | | | | | |
| **11** | **nausea with bowel symptoms.** | 22 (10.0%) | 55(25.0%) | 80 (36.0%) | 46 (20.9%) | 17 (7.7%) |
| **12** | **hard, lumpy stools daily.** | 7 (3.2%) | 37(16.8%) | 63 (28.6%) | 90 (40.9%) | 23 (10.5%) |
| **13** | **loose watery stool daily.** | 21 (9.5%) | 90(44.5%) | 76 (34.5%) | 17 (7.7%) | 8 (3.6%) |
| **14** | **Alternating between hard and loose stools.** | 19 (8.6%) | 76(34.5%) | 90 (40.9%) | 29 (13.2%) | 6 (2.7%) |

## Nutritional factors to the occurrence of the IBS

According to table (4) the study result shows nutritional factors, the majority of participants often 116 (52.7%) eat all nutrition types. nutritional factors for people diagnosis with IBS It has been found that the most common food and drinking type was drink caffeine like coffee, tea 102 (46.4%), but eat processed foods 7 (3.2%) had the lowest rate.

**Table 4. Nutritional factor related to irritable bowel syndrome.**

| NO. | Type of nutrition | Never | Rarely | Sometimes | Often | Always |
|---|---|---|---|---|---|---|
| **1** | **high-fat foods** | **7 (3.2%)** | **21 (9.5%)** | **79 (35.9%)** | **80 (36.4%)** | **33 (15.0%)** |
| **2** | **processed foods** | **64(29.1%)** | **62(28.2%)** | **60 (27.3%)** | **27 (12.3%)** | **7 (3.2%)** |
| **3** | **spicy foods.** | **30(13.6%)** | **4(20.5%)** | **79 (35.9%)** | **51 (23.2%)** | **15 (6.8%)** |
| **4** | **dairy products** | **5 (2.3%)** | **22 (10.0%)** | **49 (22.3%)** | **59 (26.8%)** | **85 (38.6%)** |
| **5** | **Bread product (gluten)** | **3 (1.4%)** | **11 (5.0%)** | **59 (26.8%)** | **59 (26.8%)** | **88 (40.0%)** |
| **6** | **high fiber foods** | **5 (2.3%)** | **16 (7.3%)** | **77 (35.0%)** | **70 (31.8%)** | **52 (23.6%)** |
| **7** | **sugary foods** | **15 (6.8%)** | **59 (26.8%)** | **77 (35.0%)** | **47 (21.4%)** | **22 (10.0%)** |
| **8** | **beverages** | **30(13.6%)** | **73 (33.2%)** | **63 (28.6%)** | **39 (17.7%)** | **15 (6.8%)** |
| **9** | **caffeine** | **4 (1.8%)** | **11 (5.0%)** | **46 (20.9%)** | **57 (25.9%)** | **102 (46.4%)** |
| **10** | **beans and legumes** | **6 (2.7%)** | **29 (13.2%)** | **80 (36. %)** | **74 (33.6%)** | **31 (14.3%)** |
| **11** | **fast foods** | **43(19.5%)** | **69 (31.4%)** | **67 (30.5%)** | **27 (12.3%)** | **14 (6.4%)** |
| **12** | **forbidden to eat.** | **10 (4.5%)** | **44 (20.0%)** | **84 (38.2%)** | **62 (28.2%)** | **20 (9.1%)** |
| **13** | **Eat Fastly** | **29(13.2%)** | **52 (23.6%)** | **68 (30.9%)** | **41(18.6%)** | **30 (13.6%)** |
| **14** | **consume large meals** | **19 (8.6%)** | **47 (21.4%)** | **87 (39.5%)** | **51(23.2%)** | **16 (7.3%)** |

In addition, table (5) revealed nutritional factors of the study sample have association with marital status (p-value =0.02). study appear eating beans and legumes shown to be associated with bloating and gas among study sample (p-value =0.03).

**Table 5: Association between IBS clinical symptoms and nutritional factors.**

| NO | IBS clinical symptoms | Nutritional type | p-value |
|---|---|---|---|
| 1 | **Abdominal discomfort** | High fatty food | 0.036 |
| | | Consume large meal | 0.016 |
| 2 | **Abdominal pain** | Consume large meal | 0.029 |
| 3 | **After toileting feel bowels have not fully emptied** | Processed food | 0.018 |
| | | Drink beverage | 0.002 |
| 4 | **Bloating and abdominal distension** | High fatty food | 0.011 |
| | | Bread product (gluten) | 0.026 |
| | | High fiber food | 0.018 |
| | | Drink beverage | 0.004 |
| | | Drink caffeine | 0.001 |
| | | Beans and legumes | 0.017 |
| | | Fast food | 0.035 |
| 5 | **Abdominal pain improves after toileting** | Drink beverage | <0.001 |
| | | Drink caffeine | 0.003 |
| | | Beans and legumes | 0.017 |
| 6 | **Mucus in stool** | Eat the forbidden food | 0.045 |
| 7 | **Feeling strong urgency to defecate** | Spicy food | 0.043 |
| | | Sugary food | <0.001 |
| | | Drink beverage | 0.018 |
| | | Beans and legumes | 0.033 |
| | | Fast food | 0.006 |
| 8 | **seasonal variation in symptoms** | Diary product | 0.038 |
| | | Drink beverage | <0.001 |
| | | Consume large meal | 0.027 |
| 9 | **Symptoms affect daily activity** | Processed food | 0.013 |
| | | Bread product (gluten) | 0.026 |
| | | Processed food | 0.027 |
| 10 | **Experience nausea with IBS** | Spicy food | 0.002 |
| | | Sugary food | 0.041 |
| | | Drink beverage | <0.001 |
| | | Eat the forbidden food | 0.023 |
| | | Eat Fastly | 0.008 |
| | | Consume large meal | 0.011 |
| 11 | **Hard stool (constipation)** | Drink beverage | 0.028 |
| 12 | **Loose watery stool (diarrhea)** | No food | ---------- |
| 13 | **Alternating between hard and watery stool** | No food | ---------- |
| 14 | **Experience fatigues with IBS** | Processed food | 0.027 |

## Psychological factors with IBS

The psychological evaluation of participants using the DASS-21 scale revealed notable findings. Figure (1) revealed depression rate (12.1%). Anxiety scores exhibited greater variability (15.6%). stress rate (11.75%). Table (6) of the Study result indicates duration IBS experience among participant there were no association with stress (p-value=0.4). residence have association with depression (p-value equal 0.017). the study appears stress and hard stool (constipation) among participant have significant association (p-value=0.01).

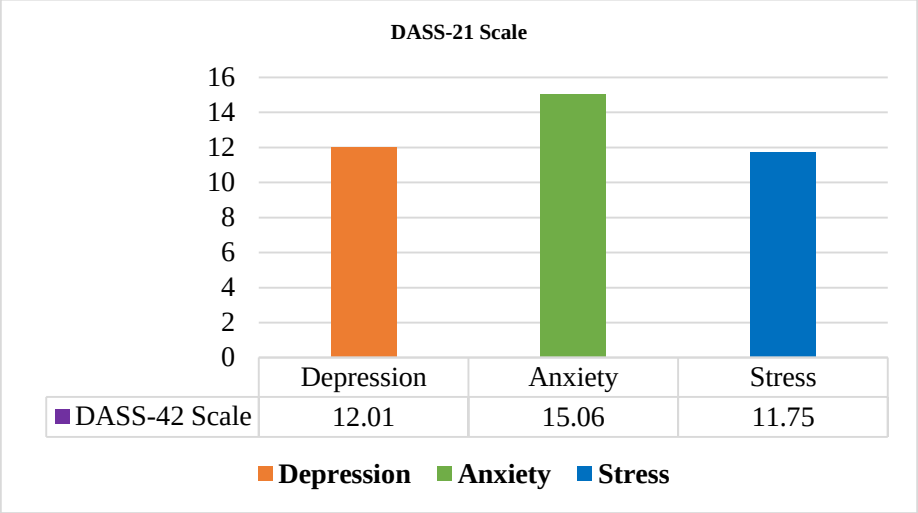


**Figure 1: DASS-21 scale estimation among the participants.**

**Table (6). Association between psychological factors and sociodemographic characteristic of the study sample**

| NO | Sociodemographic characteristics | | Depression | Anxiety | Stress |
|---|---|---|---|---|---|
| **1** | **Age** | P- value | 0.364 | 0.907 | 0.742 |
| **2** | **Gender** | P -value | 0.007 * | 0.002 * | 0.01 * |
| **3** | **BMI** | P -value | 0.738 | 0.485 | 0.054 |
| **4** | **Occupation** | P -value | 0.041 * | 0.001 * | 0.426 |
| **5** | **Educational status** | P -value | 0.077 | 0.473 | 0.065 |
| **6** | **Marital status** | P- value | 0.302 | 0.687 | 0.386 |
| **7** | **Residency** | P- value | 0.237 | 0.641 | 0.453 |
| **8** | **Monthly income** | P -value | 0.037 * | 0.031 * | 0.042 * |
| **9** | **Smoking** | P -value | 0.489 | 0.792 | 0.583 |
| **10** | **Alcohol** | P- value | 0.556 | 0.239 | 0.579 |

## DISSCUSION:

This study performed to assessing nutritional and psychological factors to the occurrence of irritable bowel syndrome among adults. Results reveal participants in this study who were diagnosed with (IBS) ranged in age from 18 to 65, with the majority (39.5%) being over 40. However, in another study age range of 20 to 30 years old had the highest prevalence of IBS among participants [11]. In terms of gender distribution, the majority of participants 73.2% were female. Comparatively, research on IBS patients shows a notable gender gap, with women being over-represented. according to recent epidemiological data, women are far more likely than men to have IBS, with a prevalence ratio of roughly 1.8–2:1 [12]. Participants report of abdominal discomfort varied in frequency 37.3% said they had it 2-3 times each week. According to a survey conducted in the United States, 61% of those who suffered from abdominal discomfort or cramps reported experiencing them at least once a week, which is greater than the results of other studies [13]. regarding sleep patterns among participant the duration of sleep within a 24-hour

period 131 (59.5%) of the participants sleep 7 hours or less, with estimates ranging from 30% to 70%, this is consistent with previous research demonstrating that sleep problems are prevalent in IBS patients [14]. daily water intake by study sample most of the participants 150 (68.2%) drink 7 glass of water or less. however, for most people, merely drinking more water than seven to eight glasses a day may not immediately lower their risk or severity of IBS [15]. The study emphasized how IBS symptoms affect day-to-day activities 28.2% of participants reported that their everyday activities were frequently impacted by their symptoms. Comparatively 220 participants 29.3% of the total, reported any activity impairment daily [16]. frequent episodes of bloating and abdominal distention were observed, with 32.7% of participants reporting this occurrence experiencing always. according to another study more than 60% of IBS patients, have bloating symptoms [17]. furthermore, the findings indicate that patients with constipation experience hard, lumpy stools more frequently (10.5% always) than those with diarrhea, which have loose, watery stools (always 3.6%) and alternate between hard and loose stools (always in 2.7% of instances). Nonetheless, a UK population survey revealed that the most prevalent IBS subtype is alternating symptoms, with mixed IBS (33.9%), constipation-predominant IBS (33.6%), diarrhea-predominant IBS (28.1%), and unsub typed IBS (4.4%) being the most common [18]. Another problem that participants reported 40.9% of the time was fatigue related to irritable bowel syndrome. however, the pooled prevalence of fatigue was 47% [19]. nutritional factors for people diagnosis with IBS it has been found that the most common food and drinking type was drink caffeine like coffee, tea 102 (46.4%). however, the study IBS participants were chosen based on their perceptions of which foods aggravated their symptoms such as yeast (20%) [20]. study appear eating beans and legumes shown to be associated with bloating and gas among study sample (p-value =0.03). according to another study many people with IBS reported that eating beans and legumes causes or exacerbates their symptoms, such as increased gas and bloating [21]. Notable results were obtained from the psychological assessment of participants utilizing the DASS-21 scale. While anxiety rate 15.06% depression scores were 12.01 %, The range of stress scores was 11.75%. In contrast to this study, the ranges for anxiety, stress, and depression were 28.7%, 25.6%, and 25.5%, respectively [22]. Study result indicates IBS experience among participant there were no association with stress (p-value=0.4). according to some research, up to 60% of IBS patients also have comorbid anxiety or depression, suggesting that stress plays a significant role in the development and severity of IBS [23]. the study appears stress and hard stool (constipation) among participant have significant association (p-value=0.01). More specifically, greater stress levels (p = 0.002) were a significant predictor of IBS overall, and constipation accounted for 26.08% of IBS cases in this study [24].

## CONCLUSION

This study demonstrates the majority of participants were females over 40 years and a significant percentage had low water intake and insufficient sleep. The most common symptoms were fatigue, bloating, and abdominal discomfort were typical symptoms, constipation was more common than other type of IBS. It also found that the use beans and legumes are also strongly linked to occurrence of IBS symptoms. A significant correlation between stress and constipation was found, and psychological evaluations showed notable levels of anxiety and depression. These results highlight a relationship between sociodemographic, dietary, and psychological aspects in experiencing of IBS symptoms. A multidisciplinary and interdisciplinary approach to minimize the occurrence of irritable bowel syndrome and the management of patients is highly essential.

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