Prevalence of Irritable Bowel Syndrome and its Association with Perceived Stress Level at The International Islamic University Malaysia among Nursing Students

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ABSTRACT

Objective: This study aims to determine the prevalence of irritable bowel syndrome (IBS) and its association with perceived stress levels among nursing students at the International Islamic University Malaysia. **Methods**: A cross-sectional design was used in this study. A three-part questionnaire was used to gather data on stress levels and IBS symptoms. Part A posed questions on socio-demographic aspects. In part B, a Perceived Stress Scale was used to measure individuals' perceived stress. Part C used a questionnaire developed by the World Gastroenterology Organisation (WGO) with the support of Danone. **Results**: The response rate was 85.5%: out of 200 students, 171 completed the questionnaires. According to the results, there is a significant relationship between stress levels and IBS ($p = 0.006$), where students who experienced moderate stress (151, 88.3%) were more exposed to IBS (60, 39.7%). There is no association between the characteristics of subjects with IBS and their level of stress ($P > 0.05$). **Conclusion**: The prevalence of IBS among the students in this study was roughly moderate. The frequency of moderate stress levels was high and there was a significant association with IBS. On the other hand, subject characteristics, e.g. smoking habits, were insignificantly associated with IBS and stress level (SL).

KEYWORDS: Prevalence, Irritable bowel syndrome, Perceived stress level

INTRODUCTION

Irritable bowel syndrome (IBS) is a disease that presents in different ways. The major symptoms of IBS are abdominal pain, bloated stomach, diarrhoea and constipation (1). The frequency and intensity of IBS symptoms may vary from day to day, or even from month to month, and may cause distress and disruptions to people's everyday lives (2). Other symptoms that accompany the main symptoms are mucus stools, feeling of incomplete evacuation, urgency and incontinence, wind, nausea, vomiting and belching. Providing a set definition of IBS is difficult because IBS is a clinical diagnosis. The best way to identify IBS is by understanding its criteria (3). Some causes of IBS are psychological, such as stress, anxiety, and depression, and some are physiological, such as dysregulation of brain-gut axis and gut motility. Stress is an external stimulus that affects the physiological and psychological wellbeing of a person, triggering a physiological responses IBS is the most common diagnosis made by gastroenterologists, where 12% of IBS patients visiting a primary care unit (4). Stress can be defined as a condition or feeling that is experienced when an individual feel that what is demanded of them is beyond their ability, or when they feel the situation they are beyond their control (5). Stress is a typical reaction to external stressors e.g. students facing heavy study workloads. It is normal to experience stress when studying, but low resistance to stressors may lead to uncontrolled stress, which causes individuals to develop other illnesses (6). This cross-sectional study aims to determine the prevalence of irritable bowel syndrome and its association with perceived stress levels among nursing students at the International Islamic University Malaysia.

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METHODS

A cross-sectional design was used in this study. This study has been approved by the Kulliyyah (Faculty) of Nursing Research Committee (KNRC), and the IIUM Research Committee (IREC). Before participating in the study, all participants were given a consent form to sign to show their voluntary participation in the study. A three-part questionnaire was used to gather data on stress levels and IBS symptoms. Part A posed questions on socio-demographic aspects such as gender, year of study, marital status, smoking status and lifestyle. In part B, a Perceived Stress Scale was used to measure individuals' perceived stress (7). The scale measures nonspecific perceived stress and has been used in many studies to assess the stressfulness of situations and the effectiveness of interventions. The questionnaire utilised a 5-point Likert scale which each participant marked with 0-4 from left to right. To compute the total assessment score, all scales were compiled and divided into three categories of stress level; mild, medium, and high. Part C used a questionnaire developed by the World Gastroenterology Organisation (WGO) with the support of Danone (8). The scoring system of this questionnaire is as follows: a score of 25-30 means the participant is likely to be suffering from IBS. A score of 15-24 means the participant may suffer from IBS and a score below 15 indicates that the participant's

symptoms are unlikely to be due to IBS. A trial questionnaire was sent to a selection of medical students. The Cronbach alpha for the perceived stress scale was 0.788 and 0.818 for the IBS questionnaire by WGO and Danone (8).

Statistical Analysis

The questionnaire was coded for analysis, and the data was analysed using SPSS package version 20.0 (SPSS, Chicago, IL, USA). Comparisons between the groups were assessed using the chi-squared test and Fisher's exact test with a 95% confidence interval (CI). The level of statistical significance was specified at $P < 0.05$.

RESULTS

Demographic Characteristics

The response rate was 85.5%: out of 200 students, 171 completed the questionnaires. The majority of students were female: 135 (78.9%) compared to 36 (21.1%) male students. Only 4 (2.3%) students were married. The respondents involved were from all 4 years, where 26.9% dominated by years two and three. Most of the students had an awareness of healthy lifestyles: only 15 of the students (8.8%) were smokers and only 10 (5.8%) did not take regular exercise. The number of students with symptoms which might be related to IBS was 62 (36.3%). In addition, there was a high percentage of students with moderate stress levels (151 students, 88.3%) (Table 1).

Table 1: Demographic characteristics of nursing students

Variables	Frequency (n)	Percentage (%)	Total
Sex			171
Male	36	21.1	
Female	135	78.9	
Year of study			171
Year 1	35	20.5	
Year 2	46	26.9	
Year 3	46	26.9	
Year 4	44	25.7	
Marital status			171
Single	167	97.7	
Married	4	2.3	
Smoking			171
Smoker	15	8.8	
Non-smoker	156	91.2	
Exercise			171
Exercising	161	94.2	
Not exercising	10	5.8	
IBS			171
Maybe	62	36.3	
No IBS	109	63.7	
Stress Level			171
Low	20	11.7	
Moderate	151	88.3	

Relationship Between Stress Levels and IBS

According to the results, there is a significant relationship between stress levels and IBS ($p = 0.006$), where students who experienced moderate stress (151, 88.3%) were more exposed to IBS (60, 39.7%) (Table 2).

Table 2: Relationship Between Stress Levels and IBS

Variable	Total n (%)	May have IBS n (%)	Does not have IBS n (%)	*P*-value
Stress level				
Low	20 (11.7)	2 (10)	18 (90)	0.006
Moderate	151 (88.3)	60 (39.7)	91 (60.3)	

Characteristics of Subjects with IBS and Level of Stress

As Tables 3 and 4 show, there is no association between the characteristics of subjects with IBS and their level of stress ($P > 0.05$).

Table 3: Characteristics of Subjects with Irritable Bowel Syndrome (IBS)

Variables	Total n (%)	May have IBS n (%)	*P*-value
Sex			
Male	36 (21.1)	12 (33.3)	NS
Female	135 (78.9)	50 (37)	
Year of study			
Year 1	35 (20.5)	14 (40)	NS
Year 2	46 (26.9)	13 (28.3)	
Year 3	46 (26.9)	18 (39.1)	
Year 4	44 (25.7)	17 (38.6)	
Marital status			
Single	167 (97.7)	59 (35.3)	NS
Married	4 (2.3)	3 (75)	
Smoker			
Yes	15 (8.8)	4 (26.7)	NS
No	156 (91.2)	58 (37.2)	
Exercises			
Yes	161 (94.2)	58 (36)	NS
No	10 (5.8)	4 (40)	

Table 4: Characteristics of Subjects Against Levels of Stress

Variables	Total n (%)	Low stress n (%)	Moderate stress n (%)	*P*-value
Sex				
Male	36 (21.1)	6 (16.7)	30 (83.3)	NS
Female	135 (78.9)	14 (10.4)	121 (89.6)	
Year of study				
Year 1	35 (20.5)	3 (8.6)	32 (91.4)	NS
Year 2	46 (26.9)	4 (8.7)	42 (91.3)	
Year 3	46 (26.9)	5 (10.9)	41 (89.1)	
Year 4	44 (25.7)	8 (18.2)	36 (81.8)	
Marital status				
Single	167 (97.7)	19 (11.4)	148 (88.6)	NS
Married	4 (2.3)	1 (25)	3 (75)	
Smoker				
Yes	15 (8.8)	2 (13.3)	13 (86.7)	NS
No	156 (91.2)	18 (11.5)	138 (88.5)	
Exercises				
Yes	161 (94.2)	20 (12.4)	141 (87.6)	NS
No	10 (5.8)	0	10 (100)	

DISCUSSION

Irritable bowel syndrome (IBS) is a term that describes a condition characterised by gastrointestinal (GI) symptoms that exaggerate normal bowel function. Psychosocial factors such as anxiety, depression and stress have been shown to have significant associations with IBS (4,5).

In this study, there is a significant relationship between the level of stress and the frequency of incidence of IBS among the students. Among 62 students in IBS groups, 60 (39.7%) of them were experiencing moderate stress levels. Pathologically, psychosocial stress can alter bowel function in both non-IBS groups and IBS groups (9). On the other hand, previous studies have shown that emotional stress and depression may influence the development of functional gastrointestinal (GI) disorders, such as functional dyspepsia (FD) and IBS (10).

In this study, the occurrence of IBS among IIUM nursing students on Kuantan Campus was 62/171 (36.3%), where female students were predominant (37%). Previous studies conducted in Vietnam and Brunei (11,12) have shown that IBS is common among Southeast Asian populations. The results of this study suggest that there is no significant association between gender and IBS ($p > 0.05$). This might be because of the small sample size and the unequal gender ratio: typically, nursing departments are dominated by women in terms of gender divisions. In contrast, Okami et al. showed a significant association ($p = 0.006$), where women were more likely to show IBS symptoms than men were (13). The reason for this result may be due to hormonal changes during the menstrual cycle (12). A systematic review by Adeyemo et al. (14), explains that out of 13 studies on IBS, 10 reported increased gastrointestinal symptoms in women with IBS during their menses.

Married people tend to have greater stress levels due to increased responsibility, the difference between individuals is only on how they face the stress they had. The rate of married students reporting symptoms of IBS was high compared with single students: three out of four married participants reported experiencing IBS symptoms. The relationship between marital status and IBS remains unclear; however, a review by Gerson and Gerson (15) states that IBS symptoms may affect relationships between partners.

A study conducted in Korea on gastrointestinal (GI) symptoms among nursing students found no correlations between year of study and GI symptoms, supporting the results of this study, which finds no significant association between seniority and IBS symptoms (16).

In regard to smoking habits and IBS occurrence, there was no association between them ($p > 0.05$). The reason might be due to the small sample size and the large percentage of students who did not smoke. This is in contrast with previous study which showed a positive association between smoking and IBS (12). Neither study discussed the possible reasons for this association. However, smoking does cause IBS symptoms as the ingredients in cigarettes are mostly chemical-based and tobacco and nicotine tend to act as immunosuppressants, causing poor blood flow in the intestinal wall. This causes gut dysmotility and dysfunction, triggering IBS symptoms (17).

Regarding lifestyle and exercise, in this study, there was no association between exercise habits and IBS ($p > 0.05$). Similarly, Okami et al. (18) found that there was no significant difference between IBS groups and non-IBS groups in terms of alcohol consumption, and smoking and exercise habits. In contrast, Daley et al. (19) reported that the exercise group reported significantly improved symptoms of constipation compared to non-exercise group. It might be that the association between IBS and exercise depends on the type, regularity and duration of exercise.

CONCLUSION

The prevalence of IBS among the students in this study was roughly moderate. The frequency of moderate stress levels was high and there was a significant association with IBS. On the other hand, subject characteristics, e.g. smoking habits, were insignificantly associated with IBS and stress level (SL). According to these results, the university management needs to develop a stress management program which may help students adapt to the stress that occurs during their studies at the university and prevent this type of dysfunctional bowel problem.

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CONFLICT OF INTEREST

The authors have no conflict of interest to declare with regard to this work.

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