

# Prevalence and Risk Factors of Irritable Bowel Syndrome in Female Students of Faculty of Applied Medical Sciences from Umm Al Qura University

Aml F Elgazar<sup>1</sup> Reham A. Mustafa<sup>2\*</sup> Nehal A. Elfky<sup>2</sup>

1.Nutrition and Food Sciences Department, Faculty of Home Economics, Helwan University, Cairo, Egypt.  
Kingdom of Saudi Arabia Makkah Al Mukarramah P.O. box: 715

2.Faculty of applied medical sciences, clinical nutrition department, Umm AlQura University , Makkah ,Saudi Arabia .Kingdom of Saudi Arabia Makkah Al Mukarramah P.O. box: 715

\* E-mail of the corresponding author: [sunrem2002@yashoo.com](mailto:sunrem2002@yashoo.com)

## Abstract

Irritable bowel syndrome (IBS) means that the bowel doesn't work or function correctly. This study aimed to determine the prevalence and factors affected irritable bowel syndrome among university students. The present study was carried out during the period from 1432 to 1433 AH among 200 female students. Data was collected through a interview questionnaire Rome III Diagnostic Questionnaires. The present study indicated that mean  $\pm$  SE values of height, weight and BMI were not significant change in non- IBS and IBS students. The frequency distribution of IBS according to the family number, data showed that 4 %, 6%, 8% and 35% of students live with three, four, five and more than of five members had IBS, respectively. Data with regard to abdominal pain or discomfort in the last three months showed that 30 ,32, 40, 20, 31 and 17 students chooses less than 1d/m, 2 to 3 d/m, 1d/w, more than 1 d/w and every day, respectively. There were 7% was often feel discomfort and have less frequent bowel movement, 13% was feel discomfort in most of the time and have less frequent bowel movement and 6% was always feel discomfort and have less frequent bowel movement. Result showed that 21, 19 and 1% of IBS were eating one, two and three snack foods, respectively, while 7% were eating one, two and three meals out the home daily. **Conclusion:** Our results concluded that food habits, mother's education, snacks numbers, favorite method of cooking and awareness of food causes had effect on IBS.

**Keywords:** Irritable bowel disorder – Causes– Syndrome – Criteria.

## 1. Introduction

Irritable bowel syndrome (IBS) is not a disease. It's a functional disorder, meaning that the bowel doesn't work, or function, correctly. It is a "syndrome," meaning a group of symptoms. The most common symptoms of IBS are abdominal pain or discomfort often reported as cramping, bloating, gas, diarrhea, and/or constipation. IBS affects the colon, or large bowel, which is the part of the digestive tract that stores stool (NIDDK , 2007). Sylvia, (2012) indicated that there are several subgroups of IBS: alternating bowel habits (IBS-A), constipation predominant IBS (IBS-C), and diarrhea-predominant IBS (IBS-D). Signs that IBS patients require medical attention include anaemia, fever, persistent diarrhea, rectal bleeding, weight loss, and nocturnal symptoms. In addition, a family history of IBS, CD, or colorectal cancer requires further diagnostic work-up

Farthing,(2004) reported that the current IBS treatments include dietary restrictions (e.g. avoidance of artificial sweeteners, fructose, carbonated beverages, fatty foods and sometimes lactose), dietary fibre supplementation, pharmacotherapy (antidiarrheal, smooth muscle relaxants, bulking agents, prokinetics, psycho tropics and serotonin receptor agonists and antagonists), and psychological therapy (e.g. relaxation, stress management). Response to these therapies, many of which are directed at symptom relief rather than modification of any heretofore unidentified physiological derangements, is often incomplete. Prospective studies have shown that 3-36% of enteric infections lead to persistent new IBS symptoms; bacterial enteritis, protozoan, and helminthic infections are often followed by prolonged post infective IBS (Spiller and Garsed, 2009). Therefore the present study aimed to determine the prevalence and factors that affected irritable bowel syndrome among students in College of Applied Medical Sciences.

## 2- Subjects and Methods

### 1. Participant and Sampling:

A cross sectional study was carried out during the period from (15-5-1433AH) to (15-7-1433 AH) among a random sample of (200) university female student aged from 19 to 24 years old were chosen from faculty of applied medical sciences in Umm Al Qura university.

### 2. Nutritional Assessment:

Data will collect through an questionnaire with sample by using:

#### 2.1: Volunteer information:

Socioeconomic level questionnaire.( it includes: age, family size, gender, working , family member, living with who, the educational level for mother)

#### 2.2: Anthropometric measurement:

Body Weight: Weight was measured using a stadiometer to the nearest 0.5 kg with minimum underwear clothes and without shoes.

Height: Height was measured to nearest 0.5cm while the student standing straight with the head, shoulder and heels vertically aligned

Body Mass Index: (Body mass index) was Calculated by dividing weight (in kilogram)/ height (meters<sup>2</sup>), the grades of body mass index were classified according to Quetelet' index (QI) by (Garrow, 1992).

#### 2.3: Medical history:

Rome III Diagnostic Questionnaires: is a system developed to classify the functional gastrointestinal disorders (FGIDs) (Rome Foundation .org , 2006).

#### 2.4: Life style:

Lifestyle is expressed (on an individual basis) in activities, food patterns, behaviors and favorite method of cooking.

#### 3. Statistical Analysis:

Statistical analysis were performed by using computer statistical package for social science (SPSS) version 16 (SPSS, 2008). We have using three tests: chi-square, T-test and frequency.

### 3-Results and Discussion

Our study founding that there are 108 persons complaining of IBS according to Rome III criteria which resemble 54% of studied sample and 92 persons non IBS who resemble 46% of studied sample .

Data in table (1) demonstrates the percentage of studied sample according to Abdominal pain or discomfort in the last three months. 30 persons selected "Never" who resemble (15%) of the total sample , also 30 persons selected "Less than 1day/month" (15%) and 32 persons selected "1day/month" (16%) . whenever 40 persons selected "2 to 3 days/month" (20%) , 20 persons selected "1day/week" (10%) , 31 persons selected "more than 1 day/week" (15.5%) and 17 persons selected "every day" (8.5%) .

With regard to the frequency distribution of studied sample according to How often did this discomfort or pain get better or stop after you had a bowel movement. "Never or rarely" was chosen by 26 persons (13%) , whenever 66 persons choose "sometimes" (33%) , 34 persons choose "often" (17%) , 47 persons choose "most of the time" (23.5%) and 27 persons choose "always" (13.5%).Also Results of table (1) showed the frequency distribution of studied sample according to When this discomfort or pain started, did there have more frequent bowel movement. 44 persons select "Never or rarely" (22%) ,92 persons select "sometimes" (46%) , 30 persons select "often" (15%) , 20 persons select "most of the time" (10%) and 14 persons select "always" (7%).As well the Results of table (1) showed that the frequency distribution of studied sample according to when this discomfort or pain started, did you have less frequent bowel movement. There were 66 (33%) persons of the total never feel discomfort or pain, while 82 (41%) persons sometimes feel discomfort or pain and have less frequent bowel movement, 14 (7%) persons often feel pain or discomfort and have less frequent bowel movement, 26 (13%) persons most of the time feel discomfort or pain and have less frequent bowel movement and 12 (6%) persons always feel discomfort or pain and have less frequent bowel movement. Results of table(1) showed that the frequency distribution of studied sample according to When this discomfort or pain started, were you stools (bowel movement) looser. There were 58 (29%) persons of the total never feel discomfort or pain, while 60 (30%) persons sometimes feel discomfort or pain and have stools (bowel movement) looser,36 (18%) persons of the total often and most of the time feel discomfort or pain and stools (bowel movement) looser and 10 (5%) persons always feel discomfort or pain and have stools (bowel movement) looser. Also the Results of table (1) indicated that the frequency distribution of studied sample according to When this discomfort or pain started, how often did you have harder stools. "Never or rarely" was chosen by 48 persons (24%) , "sometimes" was chosen by 76 persons (38%) , "often" was chosen by 26 persons (13%) , "most of the time" was chosen by 30 persons (15%) and "always" by 20 persons (10).

These results were in agreement with Tillisch *et al.*, (2005) who reported that stool consistency was determined to be the most specific criteria for alternating bowel habits. IBS-A patients reported rapid fluctuations in bowel habits with short symptom flares and remissions. while Walter *et al.*, (2010) in his study which was about " Assessment of normal bowel habits in the general adult population " mentioned that normal stool frequency is between three per week and three per day. They could not demonstrate any gender or age differences in terms of stool frequency, defecator symptoms or abdominal bloating. Some degree of urgency,

straining, and incomplete evacuation should be considered normal. At the same time, these results were in accordance with Khatri *et al.*, (2011) which their study was about "Frequency of functional constipation in 3 different populations and its causative factors" reported that the frequency of constipation was fairly greater in all the three populations studied "hospitalized patients, their attendants and medical students." This could be because of limited physical activity amongst medical students because of the increased burden of studies and low fiber intake were prominent risk factors in the constipated individuals. Their study showed that the younger age group (18 to 30 year) was most affected from the stressful symptoms of constipation. The reason could be intake of junk food, immobility, professional or academic stress. Junk food is defined by Larsen as the one containing high amount of saturated fats, salt and sugar, but little or no fruits, vegetables or dietary fiber.

Table 2 showed that the anthropometrics measurements in non-irritable and irritable students, the mean value for IBS and non-IBS were ( $156.82 \pm 0.86$  and  $159.27 \pm 0.73$  cm) of height were nonsignificant ( $p < 0.05$ ) respectively. Also the mean value ( $60.89 \pm 1.37$  and  $58.61 \pm 1.21$  kg) of weight were nonsignificant ( $p < 0.05$ ) in non-irritable and irritable students respectively. The mean value ( $23.70 \pm 0.51$  and  $23.01 \pm 0.39$ ) of BMI were nonsignificant ( $p < 0.05$ ) in non-irritable and irritable students respectively.

Data of table (3) demonstrated Demographic characteristics of studied students. It showed that the frequency distribution of studied samples according to age. The studied sample divided into two groups according to their age: from 19 to 22 years old and more than 22 years old. From (19-22) years were 16 persons, 10 of them were non-IBS and 6 persons were IBS of the total sample. While who more than 22 years were 184 persons, 82 of them were non-IBS and 102 were IBS.

Nutrition plays a role in the etiology of IBS. In this study, IBS prevalence was increased with age. These results agreed with Locke *et al.*, (2004) who stated that the incidence of a clinical diagnosis of irritable bowel syndrome in adults was estimated to be two per 1000 per year, increased with age and was higher in women than men. Also, results were in accordance with Camilleri *et al.*, (2000) who found that Constipation, IBS, and diverticulosis are common problems of aging. As well Zhou *et al.*, (2010) demonstrated that Irritable bowel syndrome is a common disorder among adolescents in South China and prevalence increases with age. While Su *et al.*, (2010) reported that the prevalence of IBS increased with decreasing age in this study, with a decrease of about 50% in participants of age more than 60 years, compared with participants of age less than 40 years.

Results in table (3) showed that the frequency distribution of studied sample according to living with. The studied sample divided to four parts according to their living with parents, one of parents, kin and others. With parents have 124 persons, 60 (30%) of them were non-IBS who resemble from the total sample, and 64 (32%) persons were IBS which resemble of the total sample. When who live with one of parents were 28 persons, 10 (5%) of them were non-IBS and 18 (9%) were IBS. Whereas who live with any kin were 14 persons, 4(2%) of them were non-IBS who resemble from the total sample, and 10 (5%) of them have IBS. Who live with others were 34 persons, 18(9%) of them were non-IBS who resemble from the total sample, and 16 (8%) were have IBS. As well.

Table (3) illustrated that the frequency distribution of studied sample according to the number of the family. 18 persons live with three members, 8 of them were non-IBS (4%), and 10 of them were IBS (5%). 20 persons live with four members, 8 of them were non-IBS (4%), and 12 of them were IBS (6%). 26 persons live with five members, 10 of them were non-IBS (5%), and 16 of them were IBS (8%). When 136 persons live with more than five members, 66 of them were non-IBS (33%), 70 of them were IBS (35%). These results were opposed with Gerson and Gerson, (2012) who found that relationship support and depth correlated with lower symptom scores. In contrast, relationship conflict correlated with higher symptom scores. The support and depth results can be interpreted in two ways. Clearly, support and depth may be beneficial to the patient and lead to lower symptom scores. However, a patient with lower scores may elicit less anxiety or distress from intimate others, which could access greater support and depth of connection. This result is consistent with the marital studies mentioned above but this was the first publication to show an effect of relationship quality on symptom severity in IBS. In our study there are non-significant between IBS and non-IBS sample. Results of table (3) show the frequency distribution of studied sample according to mother education: 22 (11%) person for non-irritable and 6 (3%) person for irritable was choose "Illiterate", 10 (5%) person for non-irritable and 6 (3%) person for irritable was choose "Primary", 6 (3%) person for non-irritable and 10(5%) person for irritable choose "Intermediary", 20(10%) person for non-irritable and 28(14%) person for irritable choose "Secondary", 28(14%) person for non-irritable and 54 (27%) person for irritable choose "Academic", 6(3%) person for non-irritable and 4(2%) person for irritable choose "Graduate" there were significant difference between IBS and non-IBS.

These results were agreed with Rogers and Youssef, (1988) who found that children of working mothers have a lower nutritional status than children of non-working mothers, however, have found maternal employment outside the home to have a positive impact on children's nutrition status. It is also believed that economically independent women are more likely to be able to use their knowledge to maintain good nutrition

and health for their children than non-economically dependent women. Also Aguillon *et al.*, (1982) and Holmboe-Ottesen *et al.*, (1988) said that there are two principal ways in which mothers' involvement in work outside the house has a negative effect on their children's nutrition and health status. First, the work load can affect the woman's own nutrition and health and consequently decrease her capacity to attend to other activities such as child care or to produce an optimum quantity of breast milk. Second, time constraints imposed by her involvement in work outside may prevent her from attending to the needs of her children. It is regrettable that it was not possible to measure women's time allocation. It is possible that working mothers spend less time than assumed in child care. Moreover, for non-working mothers, others may be sharing in child care .

Results of table (3) showed the frequency distribution of studied sample according to sport activities. There were 36(18%) persons for non-irritable and 32 (16%) persons for irritable didn't any sports activities, while 8 (4%) persons for non-irritable and 12 (6%) persons for irritable play sports daily , on the other hand 20 (10%) persons for non-irritable and 26 (13%) persons for irritable play sports "one time /week" , however 26(13%) persons for non-irritable and 34 (17%) persons for irritable play sports "two time /week " and 2 (1%) persons for non-irritable and 4(2%) persons for irritable select "three time /week "there were non-significant difference between IBS and non-IBS.

These results were in agreement with Elisabet and Magnusm, (2011) who showed that increased physical activity improves abdominal symptoms in IBS. Physically, active patients with IBS have less symptoms of deterioration compared to physically inactive patients. Their study conducted that, "This is an important message to patients that their symptoms may increase if they are physically inactive." Other studies have found that physical activity could change brain functioning and reduce stress, a cause of IBS. Hence, physical activity could be used as a primary treatment for people suffering from IBS .

Data of Table (4) showed that the frequency distribution of studied sample according sleeping after eating ."yes" was chosen by 46 persons of the total sample, where 30 (15%) of them non-IBS group and 37 (17%) of them from IBS group . On the other hand 136 persons didn't sleep after eat divided into 62 (31%) from non-IBS group and 74 (37%) of them from IBS group. There are non sig between IBS and non-IBS. In our study there are non sig between IBS and non-IBS sample. Also table (4) showed that the frequency distribution of studied sample according anxiety. "yes" was chosen by 156 persons of the total sample,72(36%) of them non-IBS, when 84 (42%) of them IBS. while 44 persons choose " No " and 20 (10%) of them non-IBS , 24 (12%) of them IBS. There were non-significant difference between IBS and non-IBS.

These results have the opposite concept with Jarrett,(1998) who investigated that Individuals with (IBS) are reported to experience more symptoms compatible with psychopathologic disorders, abnormal personality traits, and psychological distress. Conversely, individuals with psychiatric disorders report higher levels of (GI) symptoms compatible with IBS. Thus, psychological distress may contribute to GI symptoms in individuals with IBS. Also, study results were in accordance with Whitehead *et al.*, (2002) reported that at least half the IBS patients can be described as depressed, anxious. Also agreement with Mussell *et al.*, (2008) whom investigated that GI symptoms are associated significantly with depression and anxiety in primary care.

Results in table (4) showed that the frequency distribution of studied sample according Stress. "yes" was chosen by 122 persons of the total sample , 52 (26%) of them non-IBS, when 70 (35%) of them were IBS. while 75 persons choose " No " 40 (20%) of them were non-IBS and 38 (19%) of them were IBS. There were non-significant differences between IBS and non-IBS. These results disagree with Taché *et al.*, (2001) who stated that alterations of gastrointestinal motor function are part of the visceral responses to stress. Also, these result have the same opinion with Hazlett-Stevens *et al.*, (2003) ; Faresjö *et al.*, (2007) and Shen *et al.*, (2009) reported that the anxiety and depression score was high in IBS group, indicating that anxiety is a predictor of IBS diagnosis and psychological factors play an important role in development of IBS. And, agreement with Kovács and Kova, (2007) who indicated that GI patient status is associated with depressive and anxiety symptoms; in addition IBS patients have more severe depressive symptoms and depressogenic dysfunctional attitudes. As well Data in table (4) demonstrate the percentage of studied sample according to food increase pain. " Yes " was chosen by 96 person of the total sample, where 38 (19%) of them from non-IBS group and 58 (29%) of them from IBS group. On the other hand 104 person didn't increase pain after food divided into 54 (27%) from non-IBS group and 50 (25%) of them from IBS group. These results have the same opinion with Quigley, (2004) who found large meals, or food containing a large amount of fat can upset the bowel.

Results of table (4) demonstrated the demographic characters of studied sample showed that the frequency distribution of studied sample according to Awareness food cause. "Yes" was chosen by 140 person of the total sample, where 58 (29%) of them from non-IBS group and 82 (41%) of them from IBS group. On the other hand 60 persons didn't awareness food cause divided into 34 (17%) from non-IBS group and 26 (13%) of them from IBS group.

Results of table (5) showed the frequency distribution of studied sample according to numbers of meals :16 person (8%) for non-irritable and 10 persons (5%) for irritable were chosen one meal, 32persons(16%)for non irritable and 44persons(22%)for irritable were chosen two meals daily, 42 persons (21%)

for non-irritable and 46 persons (23%) for irritable were selected three meals daily, 2 persons (1%) for non-irritable and 8 persons (4%) for irritable were chosen for four or more meals daily.

Results of table (5) demonstrated the frequency distribution of studied sample according to snacks numbers: 4 persons (2%) for non-irritable and 4 persons (2%) for irritable choose Never, choose One snack were 44 persons (22%) for non-irritable and 42 persons (21%) for irritable, 38 persons (19%) for non-irritable and 38 persons (19%) for irritable choose two, 6 persons (3%) for non-irritable and 2 persons (1%) choose three.

Results of table (5) that the frequency distribution of studied sample according to eat outside, 10 persons (5%) for non-irritable and 10 persons (5%) for irritable choose Never, 34 persons (17%) for non-irritable and 40 persons (20%) for irritable choose One, 26 persons (13%) for non-irritable and 30 persons (15%) for irritable choose Two, 10 persons (5%) for non-irritable and 14 persons (7%) for irritable choose Three, 12 persons (6%) for non-irritable and 14 persons (7%) for irritable choose Daily. There were nonsignificant differences between IBS and non-IBS.

Results of table (5) illustrated that the frequency distribution of studied sample according to favorite methods of cooking. Boiling was chosen by 10 persons (5%) for non-irritable and 12 persons (6%) for irritable, Roasting was chosen by 58 persons (29%) for non-irritable and 54 persons (27%) for irritable, Frying was chosen by 4 persons (2%) for non-irritable and 28 persons (14%) for irritable, Steam was chosen by 20 persons (10%) for non-irritable and 14 persons (7%) for irritable. There were significant differences between IBS and non-IBS.

Results of table (5) showed that the frequency distribution of studied sample according to favorite drink: 26 persons (13%) for non-irritable and 18 persons (9%) for irritable choose "Water", 30 persons (15%) for non-irritable and 26 persons (13%) for irritable choose "Juice", 2 persons (1%) for non-irritable and 10 persons (5%) for irritable choose "Hot drink", 18 persons (9%) for non-irritable and 24 persons (12%) for irritable choose "Beverage", 16 persons (8%) for non-irritable and 28 persons (14%) for irritable choose "Nothing". There were significant differences between IBS and non-IBS.

This result agreed with Richard and Mac, (2007) who investigated that adverse effects of many foods and beverages are amount dependent and can be delayed, additive, and cumulative. The specific types of foods and beverages that can induce IBS symptoms include milk and milk containing products; caffeine containing products; alcoholic beverages; fruits; fruit juices; spices; seasonings; diet beverages; diet foods; diet candies; diet gum; fast foods; condiments; fried foods; fatty foods; multigrain breads; sourdough breads; bagels; salads; salad dressings; vegetables; beans; red meats; gravies; spaghetti sauce; stews; nuts; popcorn; high fiber; and cookies, crackers, pretzels, cakes, and pies.

#### 4- Recommendations

IBS cannot be cured with medications or special diets. The primary preventative measure is to identify and avoid individual triggers. Treatment options may include:

- Establish regular eating habits. Eating at regular times helps regulate your bowels.
- Eat small, frequent meals instead of large ones. This will ease the amount of food moving through your intestinal tract.
- Eat fiber-rich foods. Try whole fruits, vegetables (including beans) and whole grains like rolled oats, brown rice and whole-wheat bread. Make changes slowly. Fiber helps move food through your intestine, but it takes time for your body to adjust to eating more. Adding too much too quickly may result in gas, bloating and cramping.
- Drink enough fluids. Fiber draws water from your body to move foods through your intestine. Without enough water and fluids you may become constipated.
- Identify problem foods and eating habits. Keeping a food diary during flare-ups can help you figure out what you may be eating that's causing a problem.
- A modest increase in dietary fiber, together with plenty of clear fluids.
- Reducing or eliminating common gas-producing foods, such as beans and cabbage.
- Reducing or eliminating dairy foods, if lactose intolerance is a trigger.
- Stress management, if stress seems to be triggering the attacks.
- Establishing eating routines and avoiding sudden changes of routine.

#### 5- Conclusion

Our results concluded that food habits, mother's education, snacks numbers, favorite method of cooking and awareness of food causes had effect on IBS.

#### 6- Acknowledgement:

I would like to give a gratefully acknowledge to the following individuals for their contributions to this project: Nuha Muhammad Al. Mutairi, Hanouf Hassan Al. Dhahri, Hanouf Abdullah Abo Jamal, Nada Abdullah Al.

Osaimi and Rasha Abdulaziz Al. Solami

## References

- Aguillon, D.B., Caedo, M.M., Arnold, J.C. and Engel, R.W. (1982). The relationship of family characteristics to the nutritional status of pre-school children. *Food Nutrition Bull* . 4(4) pp:5- 12.
- Camilleri, M., Lee, J.S., Viramontes, B., Bharucha, A.E. and Tangalos, E.G. (2000). Insights into the pathophysiology and mechanisms of constipation, irritable bowel syndrome, and diverticulosis in older people. *Journal of the American Geriatrics Society* .48(9)pp:1142-50.
- Elisabet, J. and Magnusm, S. (2011). Physical Activity Improves Symptoms in Irritable Bowel Syndrome: A Randomized Controlled Trial. *American Journal of Gastroenterology*. 106 pp: 915-922.
- Faresjö, A., Grodzinsky, E., Johansson, S., Wallander, M. A., Timpka, T. and Akerlind, I. (2007). Psychosocial factors at work and in everyday life are associated with irritable bowel syndrome. *European Journal Epidemiology*. 22(7) pp:473-480.
- Farthing, M. J. (2004). Treatment options in irritable bowel syndrome. *Best Pract Res Clin Gastroenterol* 18 pp: 773–86.
- Garrow, J.S. (1988). *Obesity and related diseases* . Edinburgh: Churchill Livingstone .
- Gerson, C.D. and Gerson, M.J. ( 2012) . The Importance of Relationships in Patients with Irritable Bowel Syndrome: A Review . *International Journal of Clinical and Experimental Hypnotherapy*. 5 pp:10.1155.
- Heizer, W.D., Southern, S. and McGovern, S. (2009). The role of diet in symptoms of irritable bowel syndrome in adults: a narrative review . *Journal of the American Dietetic Association the National Institute of Diabetes and Digestive and Kidney Diseases (NIDDK)*.109(7)pp :1204-14.
- Holmboe-Ottesen, G., Mascarenhas, O. and Wandel, M.(1988) . Women's role in food production and nutrition: implications for their quality of life. *Food Nutrition Bull*.10(3):8-15.
- Jarrett, M., Heitkemper, M., Cain, K. C., Tuftin, M., Walker, E. A., Bond, E. F. and Levy, R. L. (1998). The Relationship Between Psychological Distress and Gastrointestinal Symptoms in Women With Irritable Bowel Syndrome. *Nursing Research*. 47( 3)pp 154-161 .
- Khatiri, P. K., Ali, A. D., Alzadjali, N., Bhagia, G., Khaliqdina, S. J. and Azi, S. (2011). Frequency of functional constipation in three different populations and its causative factors. *journal of Pakistan medical association*. 61(11) pp:1149-1151.
- Kovács, Z. and Ková, F. (2007). Depressive and anxiety symptoms, dysfunctional attitudes and social aspects in irritable bowel syndrome and inflammatory bowel disease. *International journal of Psychiatry in Medicine*. 37 (3) pp:245-255.
- Locke III, G R., Yawn, B.P., Wollan, P.C., Melton III, L.J., Lydick, E. and Talley, N.J. (2004). Incidence of a clinical diagnosis of the irritable bowel syndrome in a United States population. Available at: <http://onlinelibrary.wiley.com/doi/10.1111/j.1365-2036.2004.01938.x/full>
- Mussell, M., Kroenke , K., Spitzer, R. L., Williams, J. B., Herzog, W. and Löwe , B. (2008). Gastrointestinal symptoms in primary care: prevalence and association with depression and anxiety. *journal of psychosomatic research*. 64(6)pp:605-12.
- National Institute of Diabetes and Digestive and Kidney Diseases(NIDDK).(2007).Availableat:<http://digestive.niddk.nih.gov/ddiseases/pubs/ibs/>.
- Quigley, E.M.M. (2004). Prevalence and management of abdominal cramping and pain: a multi-national survey. *Alimentary Pharmacology & Therapeutics'*. 24 pp:411-419.
- Richard, P., and Mac, D. (2007). Treatment of irritable bowel syndrome in outpatients with inflammatory bowel disease using a food and beverage intolerance, food and beverage avoidance diet. *Inflammatory Bowel Disease* .13pp:91–96 .
- Rogers, B.L. and Youssef, N. (1988). The importance of women's involvement in economic activities in the improvement of child nutrition and health. *Food Nutrition Bull journal*. 10(3)pp:33-41.
- RomeFoundation.org(2006).Rome III Diagnostic Questionnaires. <http://www.romecriteria.org/pdfs/IBSMODE.pdf> .
- Shen, L., Kong, H. and Hou, X. (2009). Prevalence of irritable bowel syndrome and its relationship with psychological stress status in Chinese university students. *Journal of Gastroenterology Hepatology* .24 (2) pp:1885-1890.
- Spiller, R. and Garsed, K. (2009). Postinfectious irritable bowel syndrome. *Gastroenterology*. 136pp:1979.
- SPSS. (2008) . statistical package for social science, computer, software, ver:16. spss company, London, UK.
- Su, Y.N., Byung, C. K., Kum, H. R. and Bum, J., P. (2010). Prevalence and Risk Factors of Irritable Bowel Syndrome in Healthy Screen Undergoing Colonoscopy and Laboratory Tests. *Journal Neurogastroenterol Motil*. 16(1)pp: 47–51.
- Sylvia, E. S. (2012) . *Nutrition related diagnosis* .7th Ed. Pub. By Wolters Kluwer, Canada . pp :343-345.
- Taché, Y., Martinez, V., Million, M. and Wang, L. (2001). Stress and the gastrointestinal tract III: Stress-related

alterations of gut motor function: role of brain corticotropin-releasing factor receptors. American journal of physiology. Gastrointestinal and liver physiology. 280(2)pp: 173-177.

Tillisch, K., Labus, J. S., Naliboff, B. D., Bolus, R., Shetzline, M., Mayer, E. A. and Chang, L. (2005). Characterization of the alternating bowel habit subtype in patients with irritable bowel syndrome. American journal of gastroenterology. 100(4)pp:896-904.

Walter, S. A., Kjellström, L., Nyhlin, H., Talley, N. J. and Agréus, L. (2010). Assessment of normal bowel habits in the general adult population: the Popcol study. Scandinavian Journal of Gastroenterology. 45(5)pp:556-66.

Whitehead, W. E., Palsson, O. and Jones, K. R. (2002). Systematic review of the comorbidity of irritable bowel syndrome with other disorders: what are the causes and implications? Gastroenterology. 122 (4) pp:1140-56.

Zhou, H., Li, D., Cheng, G., Fan, J. and Lu, H. (2010). An epidemiologic study of irritable bowel syndrome in adolescents and children in South China: a school-based study. Article first published online: 14 JUL 2010 DOI: 10.1111/j.1365-2214.2010.01120.x

**Table (1): Gastrointestinal symptoms in study students (n= 200).**

Symptoms	Categories	No	%
<b>Abdominal pain or discomfort in the last three months:</b>	1- Never.	30	15
	2- Less than one day a month.	30	15
	3- One day a month.	32	16
	4- Two to three days month.	40	20
	5- One day a week.	20	10
	6- More than one day a month.	31	15.5
	7- Every day.	17	8.5
<b>How often did this discomfort or pain get better or stop after you had a bowel movement?</b>	1- Never or rarely.	26	13
	2- Sometimes.	66	33
	3- Often.	34	17
	4- Most of the time.	47	23.5
	5- Always.	27	13.5
<b>When this discomfort or pain started, did you have more frequent bowel movement?</b>	1- Never or rarely.	44	22
	2- Sometimes.	92	46
	3- Often.	30	15
	4- Most of the time.	20	10
	5- Always.	14	7
<b>When this discomfort or pain started, did you have less frequent bowel movement?</b>	1- Never or rarely.	66	33
	2- Sometimes.	82	41
	3- Often.	14	7
	4- Most of the time.	26	13
	5- Always.	12	6
<b>When this discomfort or pain started, were you stools (bowel movement) looser?</b>	1- Never or rarely.	58	29
	2- Sometimes.	60	30
	3- Often.	36	18
	4- Most of the time.	36	18
	5- Always.	10	5
<b>When this discomfort or pain started, how often did you have harder stools?</b>	1- Never or rarely.	48	24
	2- Sometimes.	76	38
	3- Often.	26	13
	4- Most of the time.	30	15
	5- Always.	20	10

- The mean differences is at the 0.05 level in the same row.

**Table (2): Anthropometrics measurements in non-irritable and irritable students.**

Measurements	Parameters as Mean ± SE		T-test	P value
	Non-irritable	Irritable		
<b>Height (cm)</b>	156.82 ± 0.86	159.27 ± 0.73	2.61	0.11
<b>actual weight (kg)</b>	60.89 ± 1.37	58.61 ± 1.21	0.62	0.43
<b>BMI (kg/m<sup>2</sup>)</b>	23.70 ± 0.51	23.01 ± 0.39	0.004	0.95

- SE Standard Error.

- The mean differences is at the 0.05 level in the same row.

**Table (3): Demographic characteristic of studied student (n=200).**

Characteristics	Non-irritable		Irritable		Total	Chi-square test	Sig.
	No	%	No	%			
<b>Age (years):</b>							
19 -22	10	5	6	3	16	4.72	<b>0.32</b>
>22	82	41	102	51	184		
<b>Living with</b>							
Parents	60	30	64	32	124	3.85	<b>0.28</b>
One of parents	10	5	18	9	28		
Kin	4	2	10	5	14		
Others	18	9	16	8	34		
<b>Number of the family</b>							
Three members	8	4	10	5	18	1.25	<b>0.74</b>
Four members	8	4	12	6	20		
Five members	10	5	16	8	26		
>Five member	66	33	70	35	136		
<b>Mother education:</b>							
Illiterate	22	11	6	3	28	19.97	<b>0.001</b>
Primary	10	5	6	3	16		
Intermediary	6	3	10	5	16		
Secondary	20	10	28	14	48		
Academic	28	14	54	27	82		
Graduate	6	3	4	2	10		
<b>physical activities:</b>							
No	36	18	32	16	68	2.29	<b>0.68</b>
Daily	8	4	12	6	20		
One time/week	20	10	26	13	46		
Two time/week	26	13	34	17	60		
Three time/week	2	1	4	2	6		

- The mean differences is at the 0.05 level in the same raw.

**Table (4): Some factors affecting irritable syndrome (n=200).**

Variables	Non-irritable		Irritable		Total	Chi-square test	Sig.
	No	%	No	%			
<b>Sleep after eat:</b>							
-Yes.	30	15	34	17	64	0.03	<b>0.87</b>
- No.	62	31	74	37	136		
<b>Anxiety:</b>							
- Yes.	72	36	84	42	156	0.007	<b>0.93</b>
- No.	20	10	24	12	44		
<b>Stress:</b>							
-Yes.	52	26	70	35	122	1.44	<b>0.32</b>
- No.	40	20	38	19	78		
<b>Food increase pain:</b>							
- Yes.	38	19	58	29	96	3.06	<b>0.08</b>
- No.	54	27	50	25	104		
<b>Awareness food cause:</b>							
- Yes.	58	29	82	41	140	3.93	<b>0.05</b>
- No.	34	17	26	13	60		

- The mean differences are at the 0.05 level in the same row.



**Table (5): Some food habits affecting on irritable syndrome (n=200).**

Variables	Non-irritable		Irritable		Total	Chi-square test	Sig.
	No	%	No	%			
<b>Meals number:</b>							
- One.	16	8	10	5	26	5.82	<b>0.12</b>
- Two.	32	16	44	22	76		
- Three.	42	21	46	23	88		
- Four or more.	2	1	8	4	10		
<b>Snacks number:</b>							
- Never.	4	2	4	2	8	9.63	<b>0.02</b>
- One.	44	22	42	21	86		
- Two.	38	19	38	19	76		
- Three.	6	3	2	1	30		
<b>Eat outside:</b>							
- Never.	10	5	10	5	20	0.32	<b>0.99</b>
- One.	34	17	40	20	74		
- Two.	26	13	30	15	56		
- Three.	10	5	14	7	24		
- Daily	12	6	14	7	26		
<b>Favorite method of cooking:</b>							
- Boiling.						18.22	<b>0.00</b>
- Roasting.	10	5	12	6	22		
- Frying.	58	29	54	27	112		
- Steam.	4	2	28	14	32		
	20	10	14	7	34		
<b>Favorite drink:</b>							
- Water.	26	13	18	9	44	12.00	<b>0.04</b>
- Juice.	30	15	26	13	56		
- Hot drink.	2	1	10	5	12		
- Beverage.	18	9	24	12	42		
- Nothing.	16	8	28	14	44		

- The mean differences is at the 0.05 level in the same row.

The IISTE is a pioneer in the Open-Access hosting service and academic event management. The aim of the firm is Accelerating Global Knowledge Sharing.

More information about the firm can be found on the homepage:

<http://www.iiste.org>

### CALL FOR JOURNAL PAPERS

There are more than 30 peer-reviewed academic journals hosted under the hosting platform.

**Prospective authors of journals can find the submission instruction on the following page:** <http://www.iiste.org/journals/> All the journals articles are available online to the readers all over the world without financial, legal, or technical barriers other than those inseparable from gaining access to the internet itself. Paper version of the journals is also available upon request of readers and authors.

### MORE RESOURCES

Book publication information: <http://www.iiste.org/book/>

Academic conference: <http://www.iiste.org/conference/upcoming-conferences-call-for-paper/>

### IISTE Knowledge Sharing Partners

EBSCO, Index Copernicus, Ulrich's Periodicals Directory, JournalTOCS, PKP Open Archives Harvester, Bielefeld Academic Search Engine, Elektronische Zeitschriftenbibliothek EZB, Open J-Gate, OCLC WorldCat, Universe Digital Library, NewJour, Google Scholar

