

Prevalence of Irritable Bowel Syndrome and its Risk Factors Among Medical Students of Peshawar, Pakistan

Bushra Iftikhar, Hassan Naveed, Kashif ur Rehman Khalil, Habib ur Rehman, Khushbaght
Department of Community Medicine, Khyber Medical College, Peshawar.

Abstract

Background: Irritable bowel syndrome is a disorder of gastrointestinal tract that is related to psychological dysfunction and is effected by the social, environmental and psychological factors. This study focuses on the various aspects of prevalence, risk factors and outcomes of the irritable bowel syndrome in medical college students

Objectives: To study the prevalence and risk factors of irritable bowel syndrome among medical students of Peshawar, Pakistan.

Study design, settings and duration: A cross-sectional study was conducted in Khyber Medical College, Khyber Girls Medical College, Rehman Medical College, Peshawar Medical College, Peshawar from January 2017 to June 2017.

Subjects and Methods: A sample size of about 552 medical students were taken by using WHO sample size calculator using 95% confidence interval and 5% margin of error through simple random sampling technique. Data was collected by administering a semi structured questionnaire and analyzed using SPSS version 20.

Results: The prevalence of IBS was 13.4% in males and 17.5% in females. IBS was positively associated with factors like stress and sleep disturbance and negatively associated with risk factors like exercise, smoking, living standards, household income and spicy food.

Conclusion: Keeping in view of high occurrence of IBS among medical colleges and university students, there is need to aware the students from the possible negative outcomes of this condition.

Key words: Irritable bowel syndrome, stress, risk factors.

Introduction

Irritable bowel syndrome (IBS) is a disorder of Gastrointestinal tract that is related to psychological dysfunction and is influenced by various factors including stress, change of environment and sleep pattern.^{1,2} IBS has a greater effect on individual's daily life activities and leads to increase cost and absenteeism from work.^{3,4}

Corresponding Author:

Kashif ur Rehman Khalil

Department of Community Medicine

Khyber Medical College, Peshawar.

Email: dr.kashif.khalil@gmail.com

Received: 03 December 2017, **Accepted:** 05 March 2018,

Published: 22 March 2018

Authors Contribution

BI has done the conceptualization of project. K did the data collection and literature search was done by HR. KRK did the Statistical analysis. HN has done the drafting, revision and writing of the manuscript.

The etiology of IBS is not yet confirmed. Various theories are proposed by different researchers that includes irritation of intestinal lumen by certain food, stress, depression and post infections etc. Abnormal visceral perception have been proposed as the primary mechanism for IBS in recent times.^{5,6}

It is also thought that increased sensitivity of the gut due to altered neurotransmitters and signals may play a role. Due to such signals even mild pain in normal individuals becomes severe in people having IBS. Some researchers suggests that psychological factors play an important role in IBS. Early child hood events are also having profound effects on children. Child abuse, neglect or other medical condition leads to stress and finally IBS.⁷

The incidence of IBS is about 1-2 % per year and Prevalence varies between 10-20% per year according to different studies.^{8,9} Approximately 10-20% of people with IBS seek medical care and an estimated 20-50% of referrals to gastrointestinal wards are related to IBS symptoms.¹⁰ The prevalence of IBS in Canada is about 6%,¹¹ Japan

10% (2006),¹² UK 10.5% (2004),¹³ US 14.1% (2005),¹⁴ Pakistan 14% (2007),¹⁵ Pakistan 34% (2005 in college students).¹⁶

Females are about two to three times more prone to IBS as compared to males.¹⁷ Quality of life and psychological factors in females leads to high prevalence of IBS in female gender.¹⁸ Gender differences in healthcare-seeking may also play a role. IBS symptoms usually starts before the age of age of 35 years. Symptoms of IBS are very rare above 40 but it does not exclude IBS and underlying etiology must be searched.¹⁹

Symptoms of IBS are also initiated by using various food and drinks e.g carbonated beverages, chocolate, tea, coffee, processed food and fried food.²⁰ Some experts think small intestinal bacteria overgrowth may lead to IBS. Researchers continue to explore a possible link between the two conditions. It is also stated that IBS is more common in people with family members who have a history of GI problems.²¹

The disease requires special attention regarding evidence based research. This study focuses on the various aspects of prevalence, risk factors and outcomes of the IBS in medical college students. The study might prove to be useful in further studies for assessing the environmental and climatic factors and might be further used to create awareness among the general public of Peshawar as well as medical practitioners. The study may also be helpful in diverting the attention of the families of disease stricken patients to improve health and life-style of IBS patients in order to have a better outcome of the treatments being taken.

Subjects and Methods

A cross-sectional study was conducted from January 2017 to June 2017. A sample size of 552 students aged 18-25 years were taken using Who sample size calculator and taking 95 Confidence interval and 5% margin of error. Students were selected from Khyber Medical College, Khyber Girls Medical College, Rehman Medical College, Peshawar Medical College and using simple random sampling technique. Standardized measuring scales/questionnaires were used to determine IBS and its related factors. ROME III criteria was used to determine IBS. Mild Moderate and severe stress depression and anxiety were assessed using DASS ²¹ (Depression, anxiety and stress scale) and quality of sleep was determined using Pittsburgh Sleep Quality Index (PSQI). Ethical clearance was obtained from ethical review board Khyber medical college. After taking informed consent data was collected using

standardized questionnaire. Data was analyzed using SPSS version 20 for windows.

Results

Among 552 medical students, 74 were having IBS, the prevalence of IBS was 13.4%, in males, 17.5% in females, 7.3% (16/74) of the students were found to be positive for IBS symptoms. Gender stress and sleep pattern were significantly associated with IBS as p -value was less than 0.05 (Table).

The association of IBS disorder with stress was determined by categorizing the data into three degrees of stress severe/high, moderate and average/low. Analyses were carried out on 552 students, out of which 156 students (28.3%) fulfilled the criteria of having severe/high degree of stress, out of which 21.8% (34/74) of the cases were positive for IBS. Out of 336 students (60.9%) were diagnosed with moderate degree of stress, out of which 10.7% (36/74) of the cases were positive for IBS. 60 students (10.9 %) suffered from low level of stress, out of which 6.7% (4/74) of the cases were positive for IBS. The results of our study shows that stress is a significant risk factor of IBS, the chi-square statistics is 13.902, with the p -value of 0.001, the result is significant at ($p < 0.05$), associated with an odds ratio of 3.90 (99 % CI) .

The relation of IBS disorder was also found to be significant with sleep disturbances. A standard criterion for determination of sleep quality was followed. Analyses were carried out on 552 students, out of which 360 students (65.2%) were having good quality of sleep, out of which 10.6% (38/74) of the cases were positive for IBS. Among 118 students (21.4%) with fair degree of sleep, 20.3% (24/74) were diagnosed to have IBS. 74 students (13.4%) with poor quality of sleep, out of which 16.2% (12/74) of the cases were positive for IBS. The result of our analyses shows the chi-square statistic is 7.909. The p -value is .019. The result is significant at $p < .05$, associated with an odds ratio of 2.16 (95 % CI).

The association of IBS disorder was found to be not significant with risk factors like exercise, smoking, living standards, household income and spicy food as clear from p -value.

Discussion

IBS is a medical condition that affects work performance of individual especially students. In present study out of 552 students, 74 students (13.4%) were positive for IBS. The age of the students ranged from 19 to 25 years. Gender can also be a risk factor for IBS. Results of our study

Table: Risk Factors for irritable bowel syndrome.

Variable	Total n = (552) n (%)	IBS n=74 (13.4%) n (%)	Non-IBS n = 478 (86.6%) n (%)	p-value	Chi Square Value	Odd-Ratio
<i>Gender</i>						
Female	332 (60)	58 (17.5)	274 (82.5)	0.001	11.852	2.69
Male	220 (40)	16 (7.3)	204 (92.7)			1.00
<i>Stress/depression</i>						
High	156 (28.3)	34 (21.8)	122 (78.2)	0.001	13.902	3.90
Moderate	336 (60.9)	36 (10.7)	300 (89.3)			1.68
Average/Low	60 (10.9)	4 (6.7)	56 (93.3)			1.00
<i>Sleep</i>						
Good	360 (65.2)	38 (10.6)	322 (89.4)	0.019	7.909	1.00
Fair	118 (21.4)	24 (20.3)	94 (79.7)			2.16
Poor	74 (13.4)	12 (16.2)	62 (83.8)			1.64
<i>Exercise</i>						
Not At All	246 (44.6)	38 (15.4)	208 (84.6)	0.390	1.884	1.00
2-3 Days/Week	200 (36.2)	22 (11)	178 (89)			0.67
4 Or More Days/Week	106 (19.2)	14 (13.2)	92 (86.8)			0.83
<i>Smoking</i>						
Yes	60 (11)	8 (13.3)	52 (86.7)	0.986	0.000	0.99
No	492 (89)	66 (13.4)	426 (86.6)			1.00
<i>Living with</i>						
Hostel	210 (38)	28 (13.3)	182 (86.7)	0.969	0.002	0.99
Home	342 (62)	46 (13.5)	296 (86.5)			1.00
<i>Income</i>						
5-20,000	50 (9.1)	10 (20)	40 (80)	0.524	2.243	1.00
21-50,000	110 (19.9)	14 (12.7)	96 (87.3)			0.58
51-100,000	224 (40.6)	30 (13.4)	194 (86.6)			0.62
>100,000	168 (30.4)	20 (11.9)	148 (88.1)			0.54
<i>Spicy food</i>						
Seldom	192 (34.8)	20 (10.4)	172 (89.6)	0.115	4.328	1.00
2-4 D/Week	204 (37)	26 (12.7)	178 (87.3)			1.26
>4 D/Week	156 (28.3)	28 (17.9)	128 (82.1)			1.88

showed higher prevalence of IBS in female students as compared to male. Liu et al conducted a similar study in Beijing University of Chinese Medicine. Symptoms of IBS were present in 36.3% females and 25% males, showing an agreement to our study results.²² Another study conducted on medical students of Karachi, Pakistan also showed increase prevalence of IBS in female students.²³ Another study done by Yan-Mei Tan et al. also showed high prevalence of that IBS among female medical students.²³ Lei Shan et al. also showed that the prevalence of IBS among Chinese university students was 14.5% in males and 16.8% in female. Another study conducted in Lebanon also showed that females are having symptoms of IBS more as compared to male students.²⁴

Medical students are prone to IBS due to stressful routine of the examinations and tests. In addition, females are more likely to have hormonal problems and sleep disorders that leads to stress and depression, which may be related to the high prevalence of IBS in them. Results of present study showed that students having severe (21.8%) and moderate (10.7%) degree of depression has higher

prevalence of IBS this shows that depression may be a significant risk factor of IBS. The co-morbidity of IBS and psychological distress is common, and the prevalence of at least one psychiatric illness ranged from 40% to 60% and has been reported as high as 80%.^{20,21} Association of IBS with mental disorders were also found by Amna et al in a study done at Agha Khan University Hospital Karachi. Results should that IBS was more common in subjects having mental disorders like depression.²⁵

Association of IBS disorder with sleep disorder was also found to be significant in our study. Results of our study suggests that students with fair (20.3%) or poor (16.2%) quality of sleep were found to be affected more with this disorder. A cross-sectional study in Beijing University of Chinese Medicine, in which according to the PSQI (physical quality of sleep index) score the severe sleep disorder was present in about 35.5% of students that were suffering from IBS. Another study done in China also showed increase symptoms of IBS in middle school students that have some sort of sleep disorders or poor quality of sleep.²⁶ The present study showed that total score of the

physical quality of sleep was higher in students with IBS. The prevalence of severe sleep disorder was (20.3%) in students suffering from IBS. Poor sleep is considered as a major risk factor that leads to increase symptoms of IBS.^{27,28} A study done by Nasir Kokhar in Shifa International Hospital Pakistan also showed that symptoms of IBS are exacerbated due to poor sleep pattern.²⁹

Spicy and fatty food consumption is also considered as a risk factor for developing or exacerbating IBS but the relationship between dietary factors and irritable bowel syndrome (IBS) needs to be further explored.²⁹ A cross-sectional study done in Iran showed that those people who were consuming spicy food were most commonly developed the symptoms of IBS.³⁰ In contrast to this our study showed no such results.

IBS symptoms were also correlated with environmental factors like living in hostel but no significant difference in results were found. However in contrast to these findings, a study conducted in Lebanon showed that IBS was more common in students that were living in hostel as compared to those living with their families.³¹

Previous studies also showed high prevalence of IBS in students that do not exercise regularly³² but no significant association of IBS with exercise was found in our study. Similarly, Dong et al also found high prevalence of IBS among Chinese university students that were not physically active.³³ Increased physical activity therefore has been shown to improve IBS symptoms.

Irritable bowel syndrome was common in medical students. Common risk factors identified in present study were stress and lack of proper sleep. Students need to be aware about possible risk factors and proper counselling to combat the particular risk factors that aggravates IBS symptoms.

Conflict of interest: None declared.

References

1. Drossman DA, Dumitrascu DL. Rome III: New standard for functional gastrointestinal disorders. *J Gastrointest Liver Dis* 2006; 15(3): 237-41.
2. Kellow JE, Azpiroz F, Delvaux M, Gebhart GF, Mertz HR, Quigley EM, et al. Applied principles of neurogastroenterology: physiology/motility sensation. *Gastroenterology* 2006; 130(5): 1412-20.
3. Whitehead WE, Palsson OS, Levy RR, Feld AD, Turner M, Von Korff M. Comorbidity in irritable bowel syndrome. *Am J Gastroenterol* 2007; 102(12): 2767-76.
4. Talley NJ. Functional gastrointestinal disorders as a public health problem. *Neurogastroenterol Motil* 2008; 20(Suppl 1): 121-9.
5. Graham DP, Savas L, White D, El-Serag R, Laday-Smith S, Tan G, et al. Irritable bowel syndrome symptoms and health related quality of life in female veterans. *Aliment Pharmacol Therapeut* 2010; 31(2): 261-73.
6. Nyrop KA, Palsson OS, Levy RL, Korff MV, Feld AD, Turner MJ, et al. Costs of health care for irritable bowel syndrome, chronic constipation, functional diarrhoea and functional abdominal pain. *Aliment Pharmacol Therapeut* 2007; 26(2): 237-48.
7. Chang JY, Locke GR, McNally MA, Halder SL, Schleck CD, Zinsmeister AR, et al. Impact of functional gastrointestinal disorders on survival in the community. *Am J Gastroenterol* 2010; 105(4): 822-32.
8. Lu CI, Chang FY, Chen CY, Luo JC, Lee SD. Significance of Rome II-defined functional constipation in Taiwan and comparison with constipation-predominant irritable bowel syndrome. *Aliment Pharmacol Therapeut* 2006; 24(2): 429-38.
9. Hillilä MT, Färkkilä NJ, Färkkilä MA. Societal costs for irritable bowel syndrome—a population based study. *Scandinav J Gastroenterol* 2010; 45(5): 582-91.
10. Macdougall JE, Johnston JM, Lavins BJ, Nelson LM, Williams VS, Carson RT, et al. An evaluation of the FDA Responder Endpoint for IBS-C clinical trials: analysis of data from linaclotide Phase 3 clinical trials. *Neurogastroenterol Motil* 2013; 25(6): 481-6.
11. Boivin M. Socioeconomic impact of irritable bowel syndrome in Canada. *Canad J Gastroenterol Hepatol* 2001; 15(Suppl B): 8B-11B.
12. Ehlin AG, Montgomery SM, Ekbohm A, Pounder RE, Wakefield AJ. Prevalence of gastrointestinal diseases in two British national birth cohorts. *Gut* 2003; 52(8): 1117-21.
13. Wilson S, Roberts L, Roalfe A, Bridge P, Singh S. Prevalence of irritable bowel syndrome: a community survey. *Br J Gen Pract* 2004; 54(504): 495-502.
14. Hungin AP, Chang L, Locke GR, Dennis EH, Barghout V. Irritable bowel syndrome in the United States: prevalence, symptom patterns and impact. *Aliment Pharmacol Therapeut* 2005; 21(11): 1365-75.
15. Jafri W, Yakoob J, Jafri N, Islam M, Ali QM. Irritable bowel syndrome and health seeking behaviour in different communities of Pakistan. *J Pak Med Assoc* 2007; 57(6): 285-7.
16. Jafri W, Yakoob J, Jafri N, Islam M, Ali QM. Frequency of irritable bowel syndrome in college students. *J Ayub Med Coll Abbottabad* 2005; 17(4): 9-11.
17. Payne S. Sex, gender, and irritable bowel syndrome: making the connections. *Gend Med* 2004; 1(1): 18-28.
18. Voci SC, Cramer KM. Gender-related traits, quality of life, and psychological adjustment among women with irritable bowel syndrome. *Qual Life Res* 2009; 18(9): 1169-76.
19. Drossman DA, Li Z, Andruzzi E, Temple RD, Talley NJ, Thompson WG, et al. US householder survey of

- functional gastrointestinal disorders. *Dig Dis Sci* 1993; 38(9): 1569-80.
20. Dekel R, Drossman DA, Sperber AD. The use of psychotropic drugs in irritable bowel syndrome. *Expert Opin Investig Drugs* 2013; 22(3): 329-39.
 21. Singh P, Agnihotri A, Pathak MK, Shirazi A, Tiwari RP, Sreenivas V, et al. Psychiatric, somatic and other functional gastrointestinal disorders in patients with irritable bowel syndrome at a tertiary care center. *J Neurogastroenterol Motil* 2012; 18(3): 324-31.
 22. Liu Y, Liu L, Yang Y, He Y, Zhang Y, Wang M, et al. A school-based study of irritable bowel syndrome in medical students in Beijing, China: prevalence and some related factors. *Gastroenterol Res Pract* 2014. (Accessed on 15th March 2018) Available from URL: <https://www.semanticscholar.org/paper/A-School-Based-Study-of-Irritable-Bowel-Syndrome-in-Liu-Liu/eb165b8094225dc68023b08bba62b4632e7aa601>
 23. Naeem SS, Siddiqui EU, Kazi AN, Memon AA, Khan ST, Ahmed B. Prevalence and factors associated with irritable bowel syndrome among medical students of Karachi, Pakistan: a cross-sectional study. *BMC Res Notes* 2012; 5(1): 255.
 24. TAN YM, Goh KL, Muhidayah R, Ooi CL, Salem O. Prevalence of irritable bowel syndrome in young adult Malaysians: a survey among medical students. *Journal of gastroenterology and hepatology* 2003; 18(12): 1412-6.
 25. Butt AS, Salih M, Jafri W, Yakoob J, Wasay M, Hamid S. Irritable bowel syndrome and psychiatric disorders in Pakistan: a case control study. *Gastroenterol Res Pract* 2012. (Accessed on 15th March 2018) Available from URL: https://ecommons.aku.edu/cgi/viewcontent.cgi?article=1024&context=pakistan_fhs_mc_med_gastroenterol
 26. Zhou HQ, Yao M, Chen GY, Ding XD, Chen YP, Li DG. Functional gastrointestinal disorders among adolescents with poor sleep: a school-based study in Shanghai, China. *Sleep Breath* 2012; 16(4): 1211-8.
 27. Roehrs T, Hyde M, Blaisdell B, Greenwald M, Roth T. Sleep loss and REM sleep loss are hyperalgesic. *Sleep* 2006; 29(2): 145-51.
 28. Cremonini F, Camilleri M, Zinsmeister AR, Herrick LM, Beebe T, Talley NJ. Sleep disturbances are linked to both upper and lower gastrointestinal symptoms in the general population. *Neurogastroenterol Motil* 2009; 21(2): 128-35.
 29. Khokhar N, Niazi AK. A long-term profile of patients with irritable bowel syndrome. *J Coll Physicians Surg Pak* 2013; 23(6): 388-91.
 30. Esmailzadeh A, Keshteli AH, Hajishafiee M, Feizi A, FeinleBisset C, Adibi P. Consumption of spicy foods and the prevalence of irritable bowel syndrome. *World J Gastroenterol* 2013; 19: 6465-71.
 31. Costanian, Tamim H, Assaad S. Prevalence and factors associated with irritable bowel syndrome among university students in Lebanon: Findings from a cross-sectional study. *World J Gastroenterol* 2015; 21(12): 3628-35.
 32. Kim YJ, Ban DJ. Prevalence of irritable bowel syndrome, influence of lifestyle factors and bowel habits in Korean college students. *Int J Nurs Stud* 2005; 42: 247-54.
 33. Dong YY, Zuo XL, Li CQ, Yu YB, Zhao QJ, Li YQ. Prevalence of irritable bowel syndrome in Chinese college and university students assessed using Rome III criteria. *World J Gastroenterol* 2010; 16: 4221-6.
-