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Irritable Bowel Syndrome: Prevalence and Associated Factors in a Faculty of Medicine in Southeast of Turkey

İrritabl Barsak Sendromu: Türkiye'nin Güneyinde Bir Tıp Fakültesinde Prevalans ve İlişkili Faktörler

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ABSTRACT

Objective: Irritable bowel syndrome (IBS) is one of the most common gastrointestinal diseases that reduce people's quality of life and work efficiency. Studies on the prevalence of IBS in Turkey are scarce. This study aims to determine IBS prevalence and related factors among medical students in Gaziantep. **Methods:** The cross-sectional study was conducted at February 2021. Data were collected from students of Gaziantep University Faculty of Medicine via online questionnaire. IBS symptoms were evaluated by using the Rome IV diagnostic criteria. **Results:** A total of 427 (171 preclinical, 256 clinical) students were examined. The average age of the participants was 22.07 ±2.55 years and 58.1% of them were women. Sixty-nine (16.2%) students had symptoms consistent with a diagnosis of IBS. The IBS prevalence was 16.9% (n=42) among the female students and 15.1% (n=27) among the male students. The prevalence in clinical classes was 19.5% and was significantly higher than preclinical classes (11.1% p=0.021). There was a significant difference between IBS and positive family history OR: 2.57 (95% CI: 1.39-4.75), food intolerance OR: 4.14 (95% CI: 2.36-7.27), frequent sleep problems OR: 2.16 (95% CI: 1.24-3.75), not exercising regularly OR: 1.71 (95% CI: 1.01-2.91). There was not a statistically significant relationship between IBS and income, body mass index, smoking and emotional stress. **Conclusion:** The general prevalence was 16.2%, and it was 19.5% in clinical classes. The factors of having IBS in family history, food intolerance, sleep problems and not exercising regularly can be associated with the prevalence of IBS.

Key words: Irritable bowel syndrome, prevalence, medical students

ÖZET

Amaç: İrritabl barsak sendromu (İBS) kişilerin yaşam kalitesini ve çalışma verimini azaltan dünya çapında en sık görülen gastrointestinal hastalıklardan birisidir. Türkiye'de İBS prevalansı ile ilgili sınırlı sayıda çalışma vardır. Bu çalışma Tıp Fakültesi öğrencilerinde IBS prevalansını ve ilişkili faktörleri belirlemek amacıyla yapılmıştır. **Yöntem:** Kesitsel çalışma 2021 Şubat ayında gerçekleştirildi. Gaziantep Üniversitesi Tıp Fakültesi öğrencilerinden online anket aracılığıyla veriler toplandı. IBS semptomları, Roma IV tanı kriterleri kullanılarak değerlendirildi. **Bulgular:** Toplam 427 (171 preklinik, 256 klinik) öğrenci analiz edildi. Katılımcıların yaş ortalaması 22,07 ±2,55 yıl, %58,1'i kadındı. İBS prevalansı %16,2 (Kız öğrenciler için %16,9 (n=42), erkek öğrenciler için %15,1 (n=27) p=0,608) olarak bulundu. Klinik sınıflarda prevalans %19,5 (n=50) olup preklinik sınıflara göre (%11,1 n=19) anlamlı olarak yüksekti (p=0,021). Ailede İBS öyküsü olması OR:2,57 (%95 CI:1,39-4,75), gıda intoleransı OR:4,14 (%95 CI:2,36-7,27), sık uyku problemleri olması OR:2,16 (%95 CI:1,24-3,75), düzenli egzersiz yapmama OR:1,71 (%95CI: 1,01-2,91) ile İBS arasında anlamlı ilişki bulundu. Beden kitle indexi, sigara, gelir durumu, geçmişte büyük üzüntü verici olay yaşama ile İBS arasında anlamlı ilişki bulunmadı (p>0,05). **Sonuç:** Genel prevalans %16,2 olup klinik sınıflarda %19,5 bulunmuştur. Ailede İBS öyküsü, gıda intoleransı, uyku problemleri ve düzenli egzersiz yapmama İBS prevalansı ile ilişkilidir.

Anahtar kelimeler: İrritabl barsak sendromu, prevalans, tıp öğrencileri

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INTRODUCTION

Irritable bowel syndrome (IBS) is one of the most common gastrointestinal diseases, in which symptoms cannot be explained by another disease, with changes in bowel habits and recurrent abdominal pain.[1] It is one of the most frequently diagnosed gastrointestinal diseases by primary care physicians and gastroenterologists and constitutes 25-50% of patient referrals to gastroenterologists.[2] Although its rate varies according to the regions and the diagnostic criteria used, the prevalence of IBS has been reported to be 11.2% worldwide.[3] IBS is a huge economic burden on the healthcare system. In the United States, it is estimated that the cost of IBS to the healthcare system is over $20 billion annually with 3.1 million outpatient services, 5.9 million prescriptions, and direct and indirect health services.[1]

Since the emergence of IBS symptoms is unpredictable, individuals' daily lives, jobs, sleep patterns, leisure time quality, eating habits, ability to travel, sexual functions, and social relationships may be affected negatively.[4] The severity of symptoms may vary from one person to another.[5] To diagnose IBS, it is necessary to rule out the possibility of diseases such as inflammatory bowel disease, colitis, infectious diarrhea, gastrointestinal cancers, and celiac disease, which can cause symptoms similar to IBS.[2] Because there are no specific biomarkers to make diagnosis possible, the Rome criteria and, with its most recent update, the Rome IV criteria are used for diagnosis.[2] According to these criteria, symptoms should begin at least 6 months before diagnosis and should be evident in the last 3 months.[6]

In the pathophysiology of the disease, which is also defined as brain-intestinal axis disorder, disruption of neurohormonal balance, inflammation, bacterial overgrowth, food intolerance, altered intestinal barriers, altered fecal flora, and genetic factors have been indicated.[7]

Stress is accepted as one of the important factors in the emergence of IBS symptoms.[8] Considering the long education process, long working hours, challenging exams, difficulties of working with patients, it can be said that medical students have higher stress levels compared to students from other disciplines.[9] Therefore, medical education may predispose to high rates of IBS.[10] It has been reported that the prevalence rate of IBS among medical students varies between 9.3% and 35.3% worldwide.[11]

Although there is no known certain cure for IBS, knowing the prevalence of IBS and relational factors is important for raising public awareness, taking preventive measures such as nutritional regulations and various psychological interventions.[10]

In Turkey, there are limited numbers of studies on the prevalence of IBS. In the literature review, we did not find any other such studies conducted with medical students. This study was conducted to determine the prevalence of IBS and related factors among the students of Gaziantep University Faculty of Medicine.

METHODS

Study population and design

This cross-sectional study was conducted in Turkey at Gaziantep University Faculty of Medicine between 1 February - 10 February in the 2020-2021 academic year. All undergraduate students were invited to take an online survey. Having the diseases and symptoms such as inflammatory bowel disease (ulcerative colitis, crohn) and its history in the family, diagnosed organic bowel disease, celiac disease, involuntary weight loss, anemia, blood findings in the stool, lactose intolerance, and history of colorectal cancer in the family were determined as exclusion criteria.

Survey form

The survey consisted of two parts. The first part includes questions about socio-demographic information (age, gender, class, income, height, weight, smoking, drug use, family history of IBS) and the factors (regular physical activity, sleep problems, and emotional stress) which can be associated with IBS. Body mass index (BMI) = kg/m^2 calculated by dividing body weight in kg by square meters of height. According to the World Health Organization BMI classification, below 18.5 were considered underweight, those 18.5-24.9 as normal weight, 25-29.9 overweight, and 30 and over obese.[12] Regular physical activity was defined as "moderate and high-intensity exercise at least 3 days a week". Sleep problems were defined as "problems with sleep, such as difficulty in the initiation and maintenance of sleep or fatigue due to insomnia in daily life, despite the favorable conditions for sleeping in the last 6 months". Emotional stress has been defined as "experiencing a past event (e.g. losing a loved one) that upset you a lot and has a long-lasting effect".

In the second part of the questionnaire, it was questioned whether there were diseases or symptoms such as "inflammatory bowel disease (ulcerative colitis, crohn) and its history in the family, diagnosed organic bowel disease, celiac disease, involuntary weight loss, anemia, blood findings in the stool, lactose intolerance and history of colorectal cancer in the family".

In the last three questions of the questionnaire, Rome IV criteria were questioned in Turkish with the following expressions.[13] Those who answered yes to at least two of these questions were defined as IBS.

Provided that the symptoms started at least 6 months ago and continued continuously for the last 3 months;

- In the last 3 months, have you had recurrent abdominal pain associated with defecation at least 1 day a week?
- In the past 3 months, have you had recurrent abdominal pains related to a change in stool frequency at least 1 day a week?
- In the past 3 months, have you had recurrent abdominal pain associated with a change in stool shape (appearance) at least 1 day a week?

The questionnaire was pre-tested among 10 students before actual data collection. The pre-tested data was not included in the final analysis.

Ethical Considerations

Before the study, approval was obtained from Gaziantep University Faculty of Medicine Ethics Committee and the dean of the medical faculty. Students were informed that the questionnaires were applied as anonymous and that the information would only be used for research purposes. Informed consents of the students who participated in the study were obtained. (Ethical Number: 2021/04 Date:06.01.2021)

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences software (SPSS), version 22.0 (IBM Inc., Chicago, IL, USA). Pearson's chi-square test was used to compare number and percentage values in descriptive statistics and analytically expressed data. These results are expressed as odds ratio (OR) and 95% confidence interval (CI). $p<0.05$ was considered statistically significant.

RESULTS

A total of 485 students completed the questionnaire, 58 students who met the exclusion criteria were excluded from the study. Thus, 427 students were included in the study. The average age of the participants was 22.07 ±2.55 years (min 18 - max 30) and 58.1% of them were women. 117 of the students were in 1st grade, 31 were in 2nd grade, 23 were in 3rd grade, 90 were in 4th grade, 48 were in 5th grade and 118 were in 6th grade. Sixty-nine (16.2%) students met the Rome IV criteria. The IBS prevalence was 16.9% (n=42) among the female students and 15.1% (n=27) among the male students. The prevalence in clinical classes (1st, 2nd, 3rd) was 19.5% (n=50) and was significantly higher than in the preclinical classes (4th, 5th, 6th) (11.1% n=19) ($p<0.021$). Most of the students (89.7% n=383) stated their income as sufficient. It was found out that 20.4% of the participants (n=87) were smoking, 30.4% (n=130) were exercising regularly, 42.6% (n=182) had a long-lasting distressing event in their past.

Table 1 shows that there was a statistically significant between IBS and having IBS in family history OR: 2.57 (95% CI: 1.39-4.75), food intolerance OR: 4.14 (95% CI: 2.36-7.27), frequent sleep problems OR: 2.16 (95% CI: 1.24-3.75), not exercising regularly OR: 1.71 (95% CI: 1.001-2.91). No statistically significant difference was found out between IBS and income, smoking, BMI, emotional stress ($p=0.361$, $p=0,107$, $p=0.592$, $p=0.627$, respectively).

Table 1. Comparison of socio-demographic and some characteristics of students with and without IBS			
	Non-IBS* n (%)	**IBS n (%)**	***p*****
Total	358 (83.8)	69 (16.2)	
Preclinical classes (1st, 2nd, 3rd)	152 (88.9)	19 (11.1)	0.021
Clinical classes (4th, 5th, 6th)	206 (80.5)	50 (19.5)	
Gender			
Male	152 (84.9)	27 (15.1)	0.608
Female	206 (83.1)	42 (16.9)	
Income			
Insufficient	39 (88.6)	5 (11.4)	0.361
Sufficient	319 (83.3)	64 (16.7)	
Positive family history of IBS.			
None	312 (86.2)	50 (13.8)	0.002
Yes	46 (70.8)	19 (29.2)	
Smoking			
No	290 (85.3)	50 (14.7)	0.107
Yes	68 (78.2)	19 (21.8)	
Body mass index (kg/m^2)			
Underweight	21 (75.0)	7 (25.0)	0.592
Normal	253 (84.1)	48 (15.9)	
Overweight	58 (85.3)	10 (14.7)	
Obese	26 (86.7)	4 (13.3)	
Continuous medication use			
No	316 (84.5)	58 (15.5)	0.331
Yes	42 (79.2)	11 (20.8)	
Food intolerance			
No	225 (91.8)	20 (8.2)	<0.001
Yes	133 (73.1)	49 (26.9)	
Regular exercise			
No	256 (86.2)	41 (13.8)	0.046
Yes	102 (78.5)	28 (21.5)	
Emotional stress			
No	193 (84.6)	35 (15.4)	0.627
Yes	165 (82.9)	34 (17.1)	
Sleep problems			
Rarely	174 (89.2)	21 (10.8)	0.008
Occasionally	104 (76.5)	32 (23.5)	
Frequently	80 (83.3)	16 (16.7)	

*IBS: Irritable bowel syndrome
**Chi-square test

DISCUSSION

In Turkey, there are limited numbers of studies on the prevalence of IBS. According to our knowledge, this is the first study to describe the prevalence of IBS in medical schools in Turkey. In our study, IBS prevalence was found to be 16.2% among medical students. The prevalence of IBS in another study conducted with students about to start a university in Turkey was reported to be 10.8%.[14] In our study, the prevalence of IBS among students in preclinical classes was found to be 11.1%, close to this result.

The prevalence of IBS has been reported globally to be 9.2% and 3.8%, respectively, according to ROME III and IV diagnostic criteria.[15] In studies conducted with medical students using Rome III criteria, the IBS prevalence was found as 9.5% in Peru, 21% in Saudi Arabia, 31.7% in Egypt, and 33.3% in China.[8,9,16,17] In recent studies conducted by using the Rome IV criteria, IBS prevalence among medical students was found to be 14.7% in Malaysia and 14% in Benin, and 31.9% in Saudi Arabia.[10,18,19] Different results in countries may be due to differences in genetic, cultural, nutritional, and study methodology.[20]

Ibrahim et al.[20] has reported that IBS prevalence increased with age and academic year. Alaqeel et al.[9] has reported in their study that the

prevalence of IBS was lowest in the first grade and the highest in the 5th grade. In this study, the prevalence of IBS was found to be significantly higher in clinical classes than in preclinical classes. Increasing age and challenging features of clinical medical education (shifts, meeting patients) were thought to affect this result.

Genetic factors can predispose some people to develop IBS.[2] Elhosseiny et al. have reported that one-third of students with IBS had a family history of this disease. [8] Ibrahim et al. have found out that those with a family history were approximately twice as likely to have IBS.[20] Similarly, it was found in this study that having a family history of IBS increased the probability of having IBS 2.5 times.

Generally, women have more IBS than men.[3] Many studies conducted with medical students also support this result.[9,17,20-22] Consistent with other studies, in this study, the IBS prevalence was found to be higher in female students (16.9%) than male students (15.1%), but no statistically significant difference was found.

Use of sleeping pills, insufficient sleep quality problems, prolonged sleep disturbances, frequent interruptions to sleep, and decreased energy during the day are more common in IBS patients.[23] Seger et al. have reported that the risk of IBS is higher among students with poor sleep quality.[10] Liu et al. have shown that 35.5% of students with IBS have severe sleep disturbances. [17] Similarly, in this study, frequent sleep problems were found to be significantly higher among students with IBS.

Increased physical activity has been reported to rehabilitate IBS symptoms.[24] In many studies, it has been found that the prevalence of IBS is lower among students who exercise regularly.[8, 19, 21, 25] Similar to other studies, in this study, the prevalence of IBS was found to be low in those who exercise regularly.

Food intolerance is common in IBS patients, and many patients identify some foods as triggers of IBS symptoms.[1] Therefore, 62% of patients make dietary restrictions on some foods to relieve symptoms.[26] Hakami et al. have reported that food intolerance increases the probability of IBS twice in university students.[27] In the present study, food intolerance was found to increase the probability of IBS four times.

The present study also has several limitations. Since the study was conducted in a single location, the results of the study cannot be generalized. The other limitation of the study is that the data are based on the statements of the participants and obtained through online surveys.

CONCLUSION

As a result, the results of this study confirmed that the prevalence of IBS increases with medical education. The overall prevalence of IBS was 16,2%, with a higher prevalence among clinical students (19.5%) than preclinical students (11.1%). Family history of IBS, food intolerance, sleep problems, and not exercising regularly are factors associated with the IBS.

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