

# Prevalence of Irritable Bowel Syndrome in Medical Students at Fundación Universitaria San Martín - Sabaneta, November 2016

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## ABSTRACT

**Introduction:** Irritable bowel syndrome (IBS) is the main functional gastrointestinal disorder, manifesting through various symptoms lacking a clear organic cause. This condition poses a health concern given its considerable costs and impact on quality of life.

**Objective:** To determine the prevalence of irritable bowel syndrome among medical students at Fundación Universitaria San Martín, Sabaneta campus, as of November 2016.

**Materials and Methods:** A cross-sectional study was conducted, involving FUSM medical students enrolled in the program for the 2016-2 period. The prevalence of the syndrome was determined by means of the Rome III criteria through a self-administered survey. Univariate and bivariate analyses were performed to investigate associations.

**Results:** A prevalence of 17.92% for IBS was found among 173 respondents, with the mixed pattern being the most frequent (77.41%). There was a potential association between IBS and generalized anxiety disorder, the presence of at least one gastrointestinal symptom, and alcohol consumption at least once a month.

**Conclusions:** The prevalence of IBS is 17.92%, suggesting a potential association with anxiety. However, major depression does not appear to be related to IBS in this study. Further research is necessary to explore the connection between habits and lifestyles that include alcohol and cigarette consumption.

# Prevalencia del síndrome de intestino irritable en los estudiantes de Medicina, de la Fundación Universitaria San Martín - Sabaneta, a noviembre de 2016

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## INFORMACIÓN ARTÍCULO

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## RESUMEN

**Introducción:** el síndrome de intestino irritable (SII) es el principal trastorno funcional gastrointestinal caracterizado por múltiples síntomas sin una causa orgánica clara, constituye un problema de salud por sus altos costos e impacto en la calidad de vida.

**Objetivo:** determinar la prevalencia del síndrome de intestino irritable en los estudiantes de Medicina de la Fundación Universitaria San Martín Sabaneta a noviembre de 2016.

**Materiales y métodos:** estudio de corte transversal, incluyó los estudiantes de Medicina de la FUSM matriculados en el programa para el periodo 2016-2. Se determinó la prevalencia del síndrome por medio de los criterios de Roma III mediante una encuesta autodiligiada. Se realizó un análisis univariado y bivariado en búsqueda de asociaciones.

**Resultados:** se encontró una prevalencia de SII en 17,92% de 173 encuestados, el patrón mixto fue el más frecuente (77,41%). Hubo una posible asociación entre el SII y trastorno de ansiedad generalizada, presencia de al menos un síntoma gastrointestinal, y consumo de alcohol al menos una vez al mes.

**Conclusiones:** la prevalencia del SII es del 17,92%, la ansiedad podría asociarse al SII. La depresión mayor no se relaciona con tener SII en este estudio. Se necesitan estudios que permitan ampliar la relación de los hábitos y estilos de vida incluidos el consumo de licor y cigarrillo.

## INTRODUCTION

IBS is one of the major functional digestive disorders (FDD) characterized by multiple gastrointestinal symptoms and linked to gastrointestinal motility disorders and visceral sensitivity. It is highly prevalent in the general population and ranks among the primary reasons of consultation (1). Although its pathophysiology is partially known, multiple identified causes include motility alterations, inflammation, psychological disorders, and visceral hypersensitivity, among others (2). In most cases, diagnosis is easily established based on clinical criteria (3).

IBS is a chronic, recurrent functional condition characterized by abdominal pain, bloating and changes in the bowel movement pattern. It is a common issue among the general population and a leading cause for seeking medical advice from general practitioners and gastroenterologists (4). It can affect people across all age groups, usually manifesting during adolescence and early adulthood. Its occurrence is more frequent among whites and has a higher prevalence among females (5).

The worldwide prevalence of IBS is 5% - 10%, with most people following a relapsing-remitting course (2,6). It is the most commonly diagnosed gastrointestinal condition, accounting for approximately 25% to 50% of all referrals to gastroenterologists (7).

A study conducted in 33 countries assessed the prevalence and global impact of functional gastrointestinal disorders (FGIDs), including IBS. This study represents the first report documenting the worldwide prevalence of these disorders. Using a diagnostic questionnaire, researchers analyzed 73,076 respondents based on the Rome IV criteria. The results showed that 49% of the female population on 6 continents met diagnostic criteria for one or more FGIDs (8).

Research conducted in Colombia, which assessed socio-health factors and the prevalence of IBS, reported a rate of 19.9% in the adult population. The study also highlighted its correlation with female gender and depressive disorders (9). While the prevalence in Colombia is estimated to be high, there is no definite consensus on the incidence and prevalence of this disorder.

In a study conducted with medical students, published in the Journal of the Faculty of Medicine of the Universidad Nacional Autónoma de México, it was found that anxiety, stress, and depression were significantly associated with IBS (10). Similarly, connections have been established between episodes of stress, depression, anxiety and poor eating habits with the onset or exacerbation of symptomatology. Consequently, it was found that individuals with digestive tract disorders show a decline in both quality of life and mental health (4,10-11). The objective of this study was to determine the prevalence of these conditions among medical students and explore possible associations with factors described in existing literature. As a result, there is a need to characterize the population of medical students in order to identify associated factors, and thus, generate a positive impact on their quality of life and academic performance, considering the great impact described in studies in this field.

## METHODS

The current study follows a descriptive cross-sectional design involving medical students from Fundación Universitaria San Martín, Sabaneta campus, who were enrolled in the 2016-2 academic term and agreed to participate after receiving the explanation of the study's objectives and methodology. Initially, a voluntary written survey was conducted following informed consent. A pilot test was administered to make adjustments to the survey instrument for its formal implementation. Inclusion criteria comprised students enrolled in the Medicine program for the 2016-2 period. Students who, when filling out the survey, stated that they had been diagnosed with organic disorders of the gastrointestinal tract (inflammatory diseases, polyps, and cancer), those who were receiving

treatment for gastrointestinal symptomatology at the time of the survey (other than treatment for IBS), those who had red flag signs and those who poorly completed surveys were excluded.

The instrument was a self-administered survey conducted by the researcher, with prior authorization of the participants via informed consent, in accordance with the Declaration of Helsinki. The instrument included open-ended and closed-ended questions, with a designated one-hour timeframe for completion. During this time, the surveyors (medical professionals in training) explained the contents of the form and addressed any doubts that arose during its completion in order to avoid any type of bias.

The survey included sociodemographic variables and gastrointestinal symptoms based on Rome III criteria (with a sensitivity and specificity of 71% and 88%, respectively), as well as clinical variables associated with mental illness, dietary habits, and lifestyle.

Within the lifestyles described in the literature, both protective factors (physical activity and fiber consumption) and risk factors (alcohol and cigarette consumption) were included. Additionally, clinical variables from validated DSM-5 criteria, indicative of stress, generalized anxiety and major depression were incorporated.

To exclude other disorders that could cause symptoms resembling IBS, red flag signs were included. These signs indicate that other organic conditions should be ruled out before confirming an IBS diagnosis. This measure aimed to avoid false positives when applying the Rome III criteria. Consequently, patients with these red flag signs were excluded from the study. While incomplete or inadequately completed surveys are usually an exclusion criterion, for this study all surveys were completed and met the established requirements for interpretation.

A descriptive statistical analysis was performed. Averages, medians, and percentages were calculated according to the nature of the variables. Inferential statistical models were used to look for potential associations between some of the variables included in the instrument and the prevalence of the syndrome, using the OpenEpi statistical program. The chi-square test was calculated with a 95% confidence interval. Qualitative variables were analyzed by means of frequencies, percentages, and medians, while quantitative variables were analyzed by means of averages.

Lastly, a bivariate analysis was performed using data contingency tables (2x2) and analyzed through the chi-square test. Irritable bowel syndrome presence served as the dependent variable, while gender, anxiety, eating habits, gastrointestinal symptoms, and alcohol and tobacco consumption were considered as independent variables.

## RESULTS

A total of 173 surveys were analyzed, each fully completed by medical students from their sixth to eleventh semesters enrolled in the second semester of 2016. Participants exhibiting clinical criteria for IBS and red flag signs were not included in the prevalence calculations because of the need for additional testing before confirming this diagnosis, corresponding to 10.4% of the total number of respondents.

Among the surveyed patients, 68% were female (Table 1), with an average age of 22 years (ranging from 20 to 44 years) (Table 2). Most of the participants resided in stratum 3 (40.46%), followed by stratum 4 (29.48%) (Table 3). Furthermore, the semester with the most students surveyed was semester VIII, representing 24.86% of the total surveys analyzed (Table 4).

**Table 1. Sociodemographic Distribution by Gender**

Gender	n	%
Female	119	68.79
Male	54	31.21

Source: own elaboration

**Table 2. Distribution by Age**

Age (years)	n	%
20 to 22	98	52.98
23 to 25	64	38.49
26 to 28	6	4.09
29 to 44	5	4.43

Source: own elaboration

**Table 3. Distribution by Socioeconomic Stratum**

Stratum	n	%
1	3	1.73
2	4	2.31
3	70	40.46
4	51	29.48
5	32	18.50
6	13	7.51

Source: own elaboration

**Table 4. Distribution by Semester**

Semester	n	%
VI	24	13.87
VII	20	11.56
VIII	43	24.86
IX	30	17.34
X	32	18.50
XI	24	13.87

Source: own elaboration

91.32% of the surveyed population indicated that they include the 3 basic meals into their diet. Additionally, over half of the respondents stated eating between 5 and 6 times a day (57.22%), and 87.28% of the students reported eating fruits and vegetables at least once a day. Physical activity is

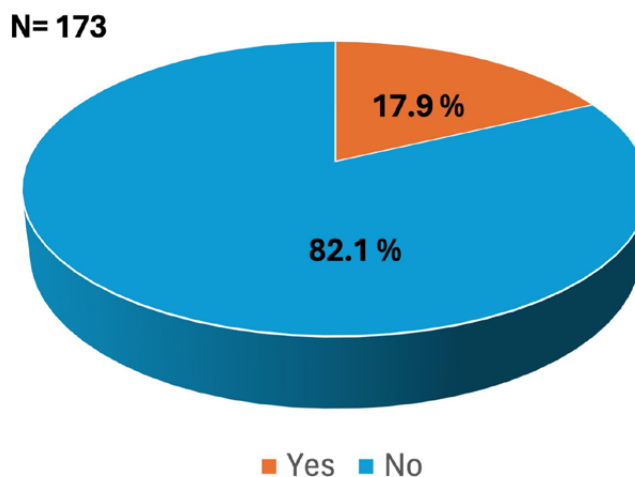
consistent, as it was found that 46.82% of participants exercise. Regarding smoking habits, 6.93% of respondents admitted cigarette smoking and 38.72% reported alcohol consumption (Table 5).

**Table 5. Sociodemographic Distribution of Habits and Lifestyles**

<b>Consumption of three basic meals</b>	<b>n</b>	<b>%</b>
YES	158	91
NO	15	8.67
<b>Physical activity</b>	<b>n</b>	<b>%</b>
YES	81	46.822
NO	92	53.17
<b>Cigarette smoking</b>	<b>n</b>	<b>%</b>
YES	12	6.93
NO	161	93.06
<b>Alcohol consumption</b>	<b>n</b>	<b>%</b>
YES	67	38.72
NO	106	61.27

Source: own elaboration

When applying the Rome III criteria, the prevalence of IBS was found to be 17.92% (Figure 1). Only 6.36% of the population reported receiving a diagnosis by a medical professional. Among those with IBS, 77.41% had a mixed pattern as their main bowel movement, 22.58% had a constipation pattern, and there were no reported cases of diarrhea (Table 6).



**Figure. 1. Prevalence of Irritable Bowel Syndrome According to the Rome III Criteria**  
Source: own elaboration

**Table 6. Type of Evacuatory Pattern According to IBS Classification**

IBS type	n	%
Mixed	24	77.41
Constipation	7	22.58
Diarrhea	0	0

Source: own elaboration

Several associations were found with IBS, including the presence of generalized anxiety (p-value = 0.009), gastrointestinal symptoms (p-value = 0.000005) and alcohol consumption at least once a month (p-value = 0.04). However, there was no significant association between IBS and being female, having major depression, lack of fiber consumption, caffeine intake, or smoking cigarettes.

## DISCUSSION

IBS is the most common functional gastrointestinal disorder. This study revealed a prevalence of 17.92%, consistent with global estimates ranging from 10% to 15% (12). In Latin America a prevalence between 9% and 18% is reported, while in Colombia, the prevalence is specifically reported as 14% (13).

No statistically significant relationship was found between being female and IBS, contrary to what is reported in the literature, which stipulates that the female-to-male ratio in irritable bowel syndrome is 3:1 (14).

Before diagnosing students with this functional disorder, it is necessary to rule out organic disorders in those who reported having any red flag signs. This is crucial as the manifestations of this disorder are unspecific. A meta-analysis of 45 observational studies reported that the odds of developing IBS increased fourfold in individuals exposed 12 months after infection (OR 4.2; 95% CI 3.1-5.7) (15). This study did not inquire about previous infections related to symptoms that could indicate a significant association.

Validated DSM-5 criteria for generalized anxiety and major depression were included. A correlation was identified between participants meeting criteria for generalized anxiety and IBS, but establishing a statistically significant association requires a specialized diagnosis of this psychiatric disorder. Moreover, larger studies are necessary to further establish the association of the disorder with this and other psychiatric illnesses.

Psychiatric disorders, particularly among patients seeking medical care, are associated with IBS and often coincide with symptoms of anxiety, sleep disturbances, affective vulnerability, and adjustment disorders (16). The literature review has found a strong association between anxiety disorders and depression with IBS. It has been reported that 40 to 60% of patients with IBS present these psychiatric manifestations (12).

While it is hypothesized that cigarette, alcohol, or caffeine consumption may be linked to IBS, the available literature does not indicate a strong association. The consumption of these substances has been studied in medical students in Latin America (17). Recent WHO studies estimate that 55% of the general population engages in some level of alcohol consumption (18).

Some studies support the efficacy of the low FODMAP (fermentable oligosaccharides, disaccharides, monosaccharides, and polyols) diet and its promising effect on the management of IBS. A meta-analysis of six randomized controlled trials (RCTs) and 16 non-RCTs showed a significant decrease in IBS symptom severity scale score, improvement in abdominal pain, bloating, and overall

quality of life (19). These findings support the diet's efficacy as a treatment for functional gastrointestinal symptoms.

In a retrospective study conducted in the United Kingdom involving 82 patients with IBS, those who had received a standard diet exhibited a lower improvement in their overall IBS symptoms (49%) over those who had received a low FODMAP diet (86%;  $p < 0.001$ ) (20).

A study conducted in Guatemala at the Hospital Roosevelt on medical students and nursing staff found a prevalence of 2.3% (14). Another research at the Pontificia Universidad Católica de Chile involving medical students reported that 74% of the respondents had consumed alcohol within the past month (18). This study found that the prevalence of alcohol consumption among the participants at least once a month was 38.73% and was associated with IBS ( $p$ -value = 0.04).

Regarding cigarette smoking, it was found in the literature review that about one-third of the world population aged 15 and above are smokers (15). Studies carried out among university students report a high prevalence of smoking. In this study, a prevalence of 6.2% of the total participants was found. However, when analyzed with respect to its possible association with IBS, no statistical relationship was found ( $p$ -value = 0.9) (21).

In a study among medical students in a hospital in Guatemala, it was found that about half of the participants were not involved in any form of physical activity (60.9%) (16). For this study, it was found that 51.44% of the participants did not engage any physical activity. Among the total participants, 27.16% engaged in physical activity at least 3 times per week. However, no statistical association was found between IBS and doing physical activity less than 3 times per week.

This study found no correlation between absence of fiber intake and the presence of irritable bowel syndrome ( $p$ -value = 0.3). In this regard, conflicting results have been found in the studies reviewed, both from a pathophysiological and therapeutic point of view. Despite these contradictions, a fiber-rich diet has been considered for many years an effective measure in the treatment of IBS (22). Nevertheless, it is necessary to apply stricter criteria for prescribing a fiber-rich diet and other substances that are influential factors in this syndrome.

The American College of Gastroenterology (ACG) guidelines suggest that a thorough clinical history, focusing on key symptoms such as abdominal pain and altered bowel habits in the absence of alarm signs, along with a physical examination and minimal diagnostic testing, is sufficient to diagnose a patient with IBS (23).

Gastrointestinal symptoms, mainly rectal tenesmus, abdominal pain, and bowel movement difficulties are very frequently reported among the population with IBS (13). In this study, an association was found between the presence of at least one of these described symptoms and having IBS. According to the literature, the most common pattern of IBS is the mixed pattern (5). In our study, we found that 85.10% of patients exhibited this pattern, while 14.89% presented a constipation-predominant pattern. However, we did not find a predominant pattern of diarrhea.

## CONCLUSIONS

The sample of medical students reflects a prevalence of IBS similar to that of the general population. Notably, the most common manifestation of IBS is the mixed or alternating pattern, which is consistent with the results obtained. Moreover, it is important to consider the connection between psychiatric disorders and the concurrence of IBS.

It is concluded that studies with stricter criteria are required regarding the correlation between habits and lifestyles (such as dietary patterns, alcohol, caffeine, and tobacco consumption) and the development of this disorder.



## LIMITATIONS

A study with stronger scientific evidence is needed to establish better associations. We acknowledge the limitations of instruments like surveys, since they rely on closed-ended questions on fiber consumption, which does not adequately validate its actual intake.

It was identified that, although an analysis of the number of daily intakes was performed, it is necessary to further include relevant foods described in the literature as IBS triggers, including scales or diets such as FODMAP, along with dietary behaviors that have a possible association with IBS and even infections prior to the onset of symptoms to better differentiate reported symptoms.

## CONFLICT OF INTEREST

The authors declare that they have no conflicts of interest.

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