# Factors associated with Irritable Bowel Syndrome in medical students

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## ABSTRACT

**Background:** Irritable Bowel Syndrome is a gastrointestinal disease that can negatively influence quality of life. Although its etiology has not been established, multiple studies have shown that the biopsychosocial factor is crucial for its development. Therefore, this study will seek to evaluate which are the most influential factors. **Material and methods**: A cross-sectional study was carried out in medical students from the Inter-American Open University, during June-July 2020. Where, through a self-administered survey, demographics, habits, lifestyle were evaluated, Rome IV Criteria and a Global Stress Perception Scale. **Results**: Of 152 students surveyed, only 32 met the diagnostic criteria, calculating a prevalence of 23%. A greater trend was obtained in students between 21-30 years old and in women, finding a statistically significant association with respect to smoking (p = 0.0056) and with students who presented an episode of isolated gastroenteritis (p = 0.0252). **Conclusion**: Not every student had an established diagnosis of the syndrome. However, smoking and isolated gastroenteritis episodes were the most influential factors. Therefore, it arises in the event that it is deemed necessary to articulate strategies that favor its detection.

## KEYWORDS

## Factores asociados al Síndrome de Intestino Irritable en estudiantes de medicina

## RESUMEN

**Introducción:** El Síndrome de Intestino Irritable es una enfermedad gastrointestinal que puede influir de forma negativa en la calidad de vida. Si bien su etiología no se ha establecido, múltiples estudios han aunado que el factor biopsicosocial es crucial para su desarrollo. Por lo tanto, este estudio buscara evaluar cuales son los factores más influyentes. **Material y métodos:** Se llevó a cabo un estudio transversal en alumnos de la carrera de medicina, de la Universidad Abierta Interamericana, durante junio-julio 2020. Donde por medio de una encuesta auto- administrada, se evaluó demografía, hábitos, estilo de vida, Criterios de Roma IV y una Escala de Percepción Global del Estrés. **Resultados:** De 152 alumnos encuestados, solo 32 cumplieron los Criterios diagnósticos, calculando una prevalencia del 23%. Se obtuvo una mayor

tendencia sobre estudiantes entre 21-30 años y en mujeres, hallando una asociación estadísticamente significativa con respecto al tabaquismo (p=0.0056) y con los alumnos que presentaron episodio de gastroenteritis aislada (p=0.0252). **Conclusión:** No todos los alumnos, presentaban un diagnostico establecido del síndrome. Sin embargo, el tabaquismo y los episodios de gastroenteritis aislada fueron los factores más influyentes. Por lo tanto, se plantea en caso de que se crea necesario articular estrategias que favorezcan su detección.

## PALABRAS CLAVE

Síndrome de intestino irritable, Estudiantes de medicina, Factores de riesgo, Estrés, Prevalencia

## INTRODUCTION

Irritable Bowel Syndrome (IBS) "is a common gastrointestinal disorder characterized by chronic abdominal pain and altered bowel habits in the absence of demonstrable organic disease" (1). As reported by studies, its prevalence varies depending on geographic location, ranging from 1% to more than 25% according to each country (2). Thus, IBS is one of the most frequently consulted gastrointestinal pathologies, including between 25% and 50% of all gastroenterological referrals (3).

Although IBS has a wide variety of clinical manifestations which may arise in other diseases (4), four subtypes have been typified within the Bristol Stool Chart: IBS with predominant diarrhea (IBS-D), IBS with predominant constipation (IBS-C), Mixed IBS (IBS-M) and unsubtyped IBS (IBS-U) (5). Thus, according to the clinical profile, it will be possible to provide not only a diagnosis using the Rome IV Criteria (6), but also the most appropriate treatment.

Due to the disparity of criteria about its etiology, IBS is considered multifactorial, so several mechanisms and secondary factors that predispose to its development have been identified (7). Among them, the interaction of the biopsychosocial model defines the bidirectional communications between gut and brain (8). It is thus necessary to emphasize that university students are exposed to high "academic stress" due to the demands and pressures involved in pursuing an undergraduate degree (9). Several studies have shown that medical students suffer from IBS with a significant prevalence compared to students from other courses (10). Therefore, the aim of this study is to evaluate which factors predispose to IBS in medical students of the Universidad Abierta Interamericana (UAI), since such factors could impact on their health.

## MATERIAL AND METHODS

**Design:** A cross-sectional, analytical and observational study was carried out during the academic year June-July 2020. Likewise, a qualitative and quantitative strategy was used within the analysis in order to generalize the results.

**Population:** A simple random sample on a total of 253 students of the different courses of the medical school. All students attending 5th and 6th year of medical school and aged ≥ 23 years were included.

On the other hand, exclusion criteria included students who did not participate anonymously or who submitted incomplete questionnaires. At the same time, we excluded students with risk factors such as: history of colon cancer or familial adenomatous polyposis, frequent rectal bleeding, Crohn's disease, celiac disease, inflammatory bowel disease, students under psychiatric treatment or those who were currently pregnant.

**Background:** The scope of the study was the School of Medicine and Health Sciences of the Universidad Abierta Interamericana.

**Interventions**: A self-administered survey through an online platform was used to collect data. The survey was designed in such a way that the student could complete it within 10 minutes.

Firstly, they were asked the year of study and their socio-demographic data (gender, age, nationality, employment status).

The survey also included relevant questions on BMI, isolated episodes of gastroenteritis, daily habits such

as smoking and alcohol and drug use, and lifestyle (hours of sleep, physical inactivity and food quality). Finally, two major scores for the elaboration of this research paper were set out in the survey: Rome IV Criteria and Perceived Stress Scale (PSS).

Rome IV Criteria: IBS is a pathology without organic lesion and biological markers. Therefore, for several years now, physicians and researchers, through the Rome Foundation, have developed the Rome Criteria to individualize IBS.

The last update took place in 2016 and was called Rome IV Criteria. It states that in order to be diagnosed with IBS, patients must have the following symptoms:

Recurrent abdominal pain on average at least one day/week in the last three months, associated with two or more of the following criteria:

- Related to defecation.
- Associated with a change in frequency of stool
- Associated with a change in form (appearance) of the stool.
- Symptom onset must have occurred six months prior to diagnosis.

Perceived Stress Scale (PSS): Stress diagnosis was performed by means of a series of 14 (fourteen) items describing different life situations. The student will rate them considering a scale that will go from 0 to 4 points, where 0 points is (never), 1 point (hardly ever), 2 points(sometimes), 3 points (frequently) and 4 points (usually).

This means that students who obtain a value $\geq 8$ will be diagnosed with psychosocial stress. However, those who obtain lower values will be diagnosed with stress.

**Statistical analysis**: It was carried out using the Microsoft Office Excel 2010 operating system, where data tabulation was performed on a (N = 152) students attending the last two years of medical studies. Likewise, statistically significant associations were evaluated through Pearson's Chi-square test (x2) and Fisher's test. A confidence level of 95% (1.96) was estimated, for a p = 0.05.

## RESULTS

According to the results obtained during the research process, out of 253 students, 152 answered the questionnaire (response rate: 60.1%), being 90 of them (40.8%) from 5th year and 62 (59.2%) from 6th year of the course.

The results also showed that 139 (91.4%) students stated that they had no personal history. However, 13 (8.6%) were excluded because they had a history of celiac disease, inflammatory bowel disease, colorectal cancer, mental illness and frequent rectal bleeding. It is important to make clear that there were no students with Crohn's disease or familial adenomatous polyposis. Nevertheless, 10 (6.6%) students reported having a history of IBS. Later, during data tabulation, 2 of them did not meet the diagnosis criteria and other 2 were excluded for having associated pathological history.

It was recorded that out of 107 university students surveyed, only 32 of them met the Rome IV Criteria, with a prevalence of 23%.

In the following tables we sought to evaluate the statistically significant differences between students who met the diagnosis criteria for IBS and those who did not.

TABLE 1. CORRELATION BETWEEN STUDENTS WITH AND WITHOUT IBS, ACCORDING TO SOCIO-DEMOGRAPHIC PROFILE.

| | Students without IBS (%) | Students with IBS (%) | P |
|---|---|---|---|
| Year | | | |
| 5º | 45 (42.1%) | 13 (40.6%) | 0.88 |
| 6º | 62 (57.9%) | 19 (59.4%) | |
| Gender | | | |

| | Students without IBS (%) | Students with IBS (%) | P |
|---|---|---|---|
| Female | 66 (61.7%) | 19 (59.4%) | 0.81 |
| Male | 41 (38.3%) | 13 (40.6%) | |
| | | | |
| Age | | | |
| 21-30 years | 73 (68.2%) | 27 (84.4%) | 0.0744 |
| 31-40 years | 32 (29.9%) | 5 (15.6%) | |
| 41-50 years | 1 (0.9%) | | |
| >51 years | 1 (0.9%) | | |
| | | | |
| Nationality | | | |
| Argentinian | 57 (53.3%) | 19 (59.4%) | 0.54 |
| Foreigner | 50 (46.7%) | 13 (40.6%) | |
| | | | |
| Employed | | | |
| Yes | 33 (30.8%) | 14 (43.8%) | 0.17 |
| No | 74 (69.2%) | 18 (56.3%) | |

(*) Significant

### TABLE 2: DIFFERENCES BETWEEN STUDENTS WITH AND WITHOUT IBS, ACCORDING TO HABITS

| | Students without IBS (%) | Students with IBS (%) | P |
|---|---|---|---|
| Smoking | | | |
| Yes | 6 (5.6%) | 7 (21.9%) | 0.0056 |
| No | 101 (94.4%) | 25 (78.1%) | (*) |
| | | | |
| Alcohol use | | | |
| Yes | 31 (29%) | 9 (28.1%) | 0.93 |
| No | 76 (71%) | 23 (71.9%) | |
| | | | |
| Illicit drug use | | | |
| Yes | 13 (12.1%) | 8 (25%) | 0.0746 |
| No | 94 (87.9%) | 24 (75%) | |

(*) Significant

### TABLE 3: DIFFERENCES BETWEEN STUDENTS WITH AND WITHOUT IBS, ACCORDING TO LIFESTYLE

| | Students without IBS (%) | Students with IBS (%) | P |
|---|---|---|---|
| Hours of Sleep | | | |
| <6 | 19 (17.8%) | 8 (25%) | |

| | | | |
|---|---|---|---|
| 6-8 | 70 (65.4%) | 20 (62.5%) | 0.76 |
| >8 | 18 (16.8%) | 4 (12.5%) | |
| Physical Inactivity | | | |
| Yes | 55 (51.4%) | 15 (46.9%) | 0.65 |
| No | 52 (48.6%) | 17 (53.1%) | |
| Diet | | | |
| Healthy | 61 (57%) | 16 (50%) | 0.48 |
| Unhealthy | 46 (43%) | 16 (50%) | |

(*) Significant

### TABLE 4: DIFFERENCES BETWEEN STUDENTS WITH AND WITHOUT IBS, ACCORDING TO BMI

| | Students without IBS (%) | Students with IBS (%) | P |
|---|---|---|---|
| (Underweight) <18.5 | 2 (1.9%) | 1 (3.1%) | 0.55 |
| (Normal weight) 18.5-24.9 | 80 (74.8%) | 28 (87.5%) | 0.13 |
| (Overweight) >25 | 25 (23.4%) | 3 (9.4%) | 0.0834 |

(*) Significant

### TABLE 5: CORRELATION BETWEEN STUDENTS WITH AND WITHOUT IBS, ACCORDING TO ISOLATED EPISODES OF GASTROENTERITIS AND STRESS.

| | Students without IBS (%) | Students with IBS (%) | P |
|---|---|---|---|
| Isolated episodes of gastroenteritis | | | |
| Yes | 2 (1.9%) | 4 (12.5%) | 0.0252 |
| No | 105 (98.1%) | 28 (87.5%) | (*) |
| Stress | | | |
| Yes | 76 (71%) | 17 (53.1%) | 0.059 |
| No | 31 (29%) | 15 (46.9%) | |

(*) Significant

Finally, the comparison of stool characteristics showed that 46.9% suffered from diarrhea, out of whom 9 were men and 6 were women, 34.4% presented mixed IBS, out of whom 7 were women and 4 were men and 18.8% presented constipation and they were only 6 women.

## DISCUSSION

Clearly, Irritable Bowel Syndrome (IBS) is a pathology that has been globally studied for years within the university context. However, in the Argentine Republic the number of published studies is still scarce. For this reason, this study has shown that medical students attending the Universidad Abierta Interamericana have a higher prevalence compared to a research performed on medical students at the Universidad Peruana Cayetano Heredia (a Peruvian university), whose prevalence is 9.5% (11). In fact, Ibrahim NK (2016) refers that medical students have a relatively high prevalence, ranging from 9.3% to 35.5% (12). It is important to take into account that the geographic location, the sample size and the diagnosis criteria used could be a substantial factor during the analysis, since they could generate discrepancies in the results.

Since IBS does not have an established etiology, several factors that may intervene in its development have been categorized. In the first place, women do not represent a statistically significant value, but they represent a higher percentage than men. This may be due to the fact that, although women have a 2:1 predominance with respect to men (13), one of the possible causes is that sex hormones have an effect on the brain-gut-microbiota axis. Evidence has shown that estrogen causes an alteration in visceral sensitivity and androgens, such as testosterone, cause an inhibition of visceral hyperalgesia (14), resulting in a greater susceptibility of women to suffer from the syndrome.

The situation is similar regarding the age group, with a greater tendency in students between 21-30 years of age. Although its cause is not completely established, it has been possible to assess that the age range reported in research on medical students is less than 25 years old (15).

It is necessary to highlight that during the evaluation, it is possible to evidence a significant association with those students who suffer from isolated episodes of gastroenteritis. According to Klem F (2017), one out of nine people exposed to infectious enteritis may develop IBS (16) and, together with female gender, it may be a relevant factor in the pathogenesis of the syndrome. (17)

On the other hand, regarding lifestyle, the results were found to be unrelated; however, according to the habits reported by the students, smoking shows a significant result compared with the rest of the variables. Despite this, there is no evidence to justify that smoking can be an influential factor in the development of the syndrome, which does not mean that it affects the gastrointestinal tract (18) (19).

Although stress factors have been considered one of the main causes of IBS, students show a different behavior, with no significant association. Studies show that exams and long study days, associated with the hospital workload, would cause stress on students, which, if persisting over time, would affect the student's health (20). For this reason, it is possible that one of the causes for the failure to correlate stress with IBS is due to the context of the SARS-Cov2 pandemic.

In conclusion, IBS is a functional pathology that may arise in all individuals and any of the factors described could infer in its appearance. Not all the students surveyed had been previously diagnosed with the syndrome, so this research paper aims to emphasize on its importance, since it is a very frequent pathology, but, at the same time, it is not properly taken into account in the university context. Consequently, academic authorities will be able to elaborate strategies that favor its detection in case they consider it necessary. On the other hand, a more exhaustive study will be required to confirm scientific evidence.

## CONFLICTS OF INTEREST

This research work does not have any conflict of interest.

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