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Impact of Irritable Bowel Syndrome (IBS) on the Quality of Life of Students at the Faculty of Medical Sciences of Bouake

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Abstract

Introduction: Irritable bowel syndrome (IBS) is a benign condition that affects the quality of life (QoL) of patients. The objective of this study was to evaluate its impact on the quality of life of students at the Faculty of Medical Sciences of Bouake. Materials and methods: This was a cross-sectional study with analytical aims carried out from January 2022 to July 2022. Included in the study were 251 medical students from the Faculty of Medical Sciences of Bouake who did not suffer from any known organic or psychiatric illness. Parameters relating to sociodemographic characteristics, clinical symptoms, severity of symptoms, and dimensions of quality of life, evaluated using the medical outcome study short form (Mos-SF-36) were collected and analyzed. Comparisons were made using the Chi 2 test, T-Student and ANOVA. The significance threshold was set at $p < 0.05$. Results: Of the 251 students who participated in the study, 95 suffered from IBS, representing a prevalence of 38.7%. The average age of students suffering from IBS was 23.9 years ± 3 years. These students lived outside the family home in 78.9% of cases. The symptoms presented were considered moderate in 48.4% of cases and severe in 33.7% of cases. IBS-D and IBS-C subtypes were the most observed with respective prevalence's of 38.9% and 31.6%. The factors found associated with IBS were female gender ($p = 0.023$), level of study doctorate I ($p = 0.036$) and stress ($p = 0.005$). All dimensions of quality of life were impaired in these students. This alteration in quality of life was significantly associated with the severity of symptoms ($p = 0.048$) and the level of master 1 study ($p = 0.005$). Conclusion: IBS is a common condition among medical students with symptoms considered moderate to severe leading to impaired quality of life.

Keywords

Irritable Bowel Syndrome, Quality of Life, Severity, Medical Students, Bouake

1. Introduction

Irritable bowel syndrome (IBS) is the most common disorder of the brain-gut axis interactions, formerly called functional intestinal disorders, with a worldwide prevalence estimated at 11% [1]. In clinical practice, it is characterized by recurrent abdominal pain and transit disorders, the common features of which are the absence of any lesional, infectious or metabolic abnormality and the absence of impact on the patient's general condition [2] [3]. In Africa, studies on irritable bowel syndrome are fragmentary and partial, however, some studies conducted in Benin, Morocco and Mali estimate its prevalence between 13% and 21% [4]-[6]. Although IBS is a benign condition, its clinical polymorphism and psychosocial impact are the cause of significant healthcare consumption which makes this condition a public health problem [4] [7]. Furthermore, medical students form a group of students characterized by enormous cognitive and emotional changes caused by increasingly difficult studies and exams making them at risk of developing this condition [8] [9]. However, very few studies on IBS have been conducted in Ivory Coast [10] and none have focused on the impact of this condition on the quality of life of medical students. The aim of this study was to assess the prevalence and severity of IBS among Ivorian medical students and its impact on their quality of life.

2. Patients and Methods

This was a cross-sectional, analytical study carried out at the UFR of Medical Sciences of Bouake in Ivory Coast from January 2022 to July 2022. Included were students regularly registered at the Faculty of Medical Sciences of Bouake in license, master and doctorate years having given their informed consent for participation in the study. Excluded from the study were students suffering from an organic digestive and/or extra digestive condition, students with impaired general condition, students with comorbidities (renal disease, heart disease, hypertension, diabetes), students being monitored for psychiatric disorders, students with disabilities, students with a pregnancy and wet nurses.

2.1. Sampling

It was exhaustive and included all students regularly enrolled at the Bouake Faculty of Medicine who met the inclusion criteria and gave their consent during the study period.

2.2. Data Collection

For each student included, a first questionnaire covering sociodemographic data,

digestive and neuropsychiatric symptoms related to IBS, IBS diagnosis, subtype and severity. In students diagnosed with IBS, a quality of life assessment was carried out using the Medical Outcome Study Short Form (MOS SF-36). The different questionnaires were completed by the students under the supervision of a senior physician specializing in Gastroenterology. The variables collected were classified into primary and secondary judgment criteria.

2.3. Main Judgment Criteria

The first main judgment criterion was the diagnosis of IBS, retained according to the new ROME IV criteria defined by: Abdominal pain or digestive discomfort (unpleasant, non-painful abdominal sensation) occurring at least one day a week during the last three months, associated with at least two or more of the following symptoms:

1) related to defecation;
2) occurrence associated with a change in stool frequency;
3) occurrence associated with a change in stool consistency.

Students with IBS were divided according to IBS subtypes:

1) IBS with constipation (IBS-C);
2) IBS with diarrhea (IBS-D);
3) IBS with alternating diarrhea and constipation (IBS-M);
4) Unclassified IBS (IBS-I).

The second main criterion of judgment was the severity of IBS determined by the FRANCIS score which allowed to distinguish 04 stages of distinct severity:

1) Minimal symptoms if the score is less than 75;
2) Moderate symptoms if the score is between 75 and 175;
3) Severe symptoms if the score is between 175 and 300;
4) Very severe symptom if score greater than 300.

The third main criterion of judgment was the quality of life of students suffering from SSI assessed by the score "out come study short form (MOS SF-36)". This score includes 36 questions and was filled out by the students themselves. The average duration of the questionnaire is estimated at 30min. The SF-36 made it possible to evaluate 8 dimensions of health: physical functioning (PF), social functioning (SF), bodily pain (BP), general health (GH), vitality (VT), role physical (RP), role emotional (RE), and mental health (MH). The evaluation of the quality of life in the dimensions of health was carried out using interactive software available on the site https://orthotoolkit.com/sf-36/.

2.4. Secondary Judgment Criteria

The secondary judgment criteria were: male or female gender, age, place of residence: family and non-family residence, level of study: license, master's and doctoral, symptoms related to IBS: abdominal pain, constipation, diarrhea, alternating diarrhea constipation, neuropsychiatric symptoms: stress, anxiety, depression.

2.5. Statistical Analysis

For data entry and analysis, we used SPSS software version 2.0. The qualitative variables were expressed in proportion. Quantitative variables were expressed as a mean, standard deviation and extreme values. The analysis consisted firstly in a descriptive analysis (means and frequencies) of the variables studied. Secondly, we searched for factors associated with IBS and impaired quality of life using a univariate analysis. This analysis was done using classic parametric tests (Chi2 test, Student's test, ANOVA). The difference was significant for a p value less than 0.05.

2.6. Ethics

The study was carried out with the authorization of the Director of Faculty of Medical Sciences of Bouake of and the scientific medical director of Bouake University Hospital. Confidentiality was respected with the allocation of an anonymity number to each survey form.

3. Results

Of the 251 students who participated in the study whose characteristics are described in Table 1, IBS was diagnosed in 95 students, representing a prevalence of 37.8%.

The sociodemographic characteristics of the 95 students suffering from IBS are collected in Table 2. There were 49 men and 46 women. The average age of the students suffering from IBS was 24 years with extremes ranging from 18 to 36 years. These students resided in university residences in 56.6% of cases and were enrolled in License, Master and Doctorate years in 26.3%, 32.6% and 41.1% of cases respectively.

The main digestive symptoms presented were respectively abdominal pain (100%), diarrhea (58.9%), bloating (54.7%), constipation (52,6%) and alternating diarrhea constipation (22.1%). Abdominal pain was diffuse in 50.5% of cases. Students suffering from IBS described a normal appearance of stools type 3,4 and 5 according to Bristol in 62.1% of cases. Students reported neuropsychiatric symptoms namely stress (54.7% of cases), anxiety (28.4% of cases) and depression (22.1% of cases). The IBS-D and IBS-C subtypes were the most observed with respective prevalence's of 38.9% and 31.6%. (Table 3). The factors found significantly associated with IBS among the participants were gender female ($p = 0.023$), Doctorate 1 level of study ($p = 0.036$) and the presence of stress ($p = 0.005$). Table 4.

Regarding the quality of life of students suffering from irritable bowel syndrome (IBS), it was impaired in all domains of the SF 36 compared to the general reference population, according to the SF 36 score (Figure 1). Our study found a more marked impairment in quality of life in girls, but not significantly (Figure 2). No significant difference in quality of life was observed between the different subtypes of IBS (Figure 3). The level of education was significantly linked to a

poorer quality of life in terms of general health (GH) in master's students (Figure 4). Perceived health was significantly impaired when the Francis score was greater than or equal to 250 (p = 0.005) (Figure 5).

Table 1. General characteristics of the 251 students who participated in the study.

Study population	Number of employees; n = 251	%
Sex		
Male	152	60.6
Female	99	39.4
Age		
[15 - 20 years]	29	11.6
[21 - 25 years]	158	62.9
> or = 26 years	64	25.5
Level of study		
License (L2; L3)	69	27.5
Master (M1; M2)	97	38.6
Doctorate (D1; D2)	85	33.9
Place of residence		
University city	142	56.6
Family	44	17.5
Individual home or shared accommodation	65	25.9
SII	95	37.8

Table 2. Sociodemographic characteristics of students suffering from IBS.

Students with SSI	Number of employees n = 95	%
Sex		
Male	49	51.6
Female	46	48.4
Age		
[15 - 20 years]	11	11.6
[21 - 25 years]	62	65.3
> or = 26 years	22	23.1
Level of study		
Bachelor's (L2; L3)	25	26.3
L2	13	13.7
L3	12	12.6
Master's (M1; M2)	31	32.6

Continued

M1	17	17.9
M2	14	14.7
Doctorate (D1; D2)	39	41.1
D1	30	31.9
D2	9	9.5
Place of residence		
University city	50	52.6
Family	20	21.1
Individual home or shared accommodation	25	26.3

Table 3. Clinical characteristics of students suffering from IBS.

Students with SSI	Number of employees n = 95	%
Abdominal pain	95	100
Diffuse	48	50.5
Located	47	49.5
Diarrhea	56	58.9
Bloating	52	54.7
Constipation	50	52.6
Alternating diarrhea constipation	21	22.1
Stool appearance according to Bristol		
Type 1,2	19	20
Type 2,3,4	59	62.1
Type 5.6	17	17.9
Anxiety	27	28.4
Depression	21	22.1
Stress	52	54.7
SSI Subtypes		
SII-C	30	31.6
SII-D	37	38.9
SII-M	19	20
SII-I	9	9.5
IBS severity (FRANCIS score)		
Score < 75	17	17.9
Score from 75 to 175	46	48.4
Score from 175 to 300	29	30.5
Score from 300 to 500	3	3.2

Table 4. Factors associated with SSI in univariate analysis.

	SSI yes	SSI no	p
Gender F	53(53.5%)	46 (46.5%)	0.023
Family residence (yes)	20 (45.45%)	24(54.54%)	0.325
Doctorate 1	31	30	0.036
Stress yes	57(52.3%)	52 (47.7%)	0.005

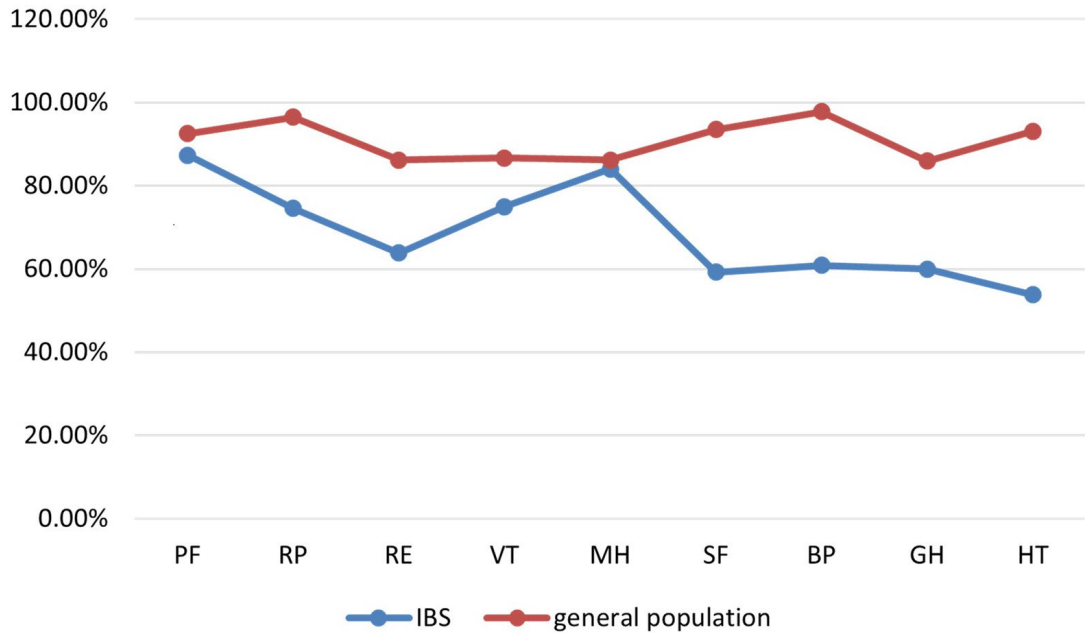

Figure 1. SF-36 scores in students with IBS and those in the general population.

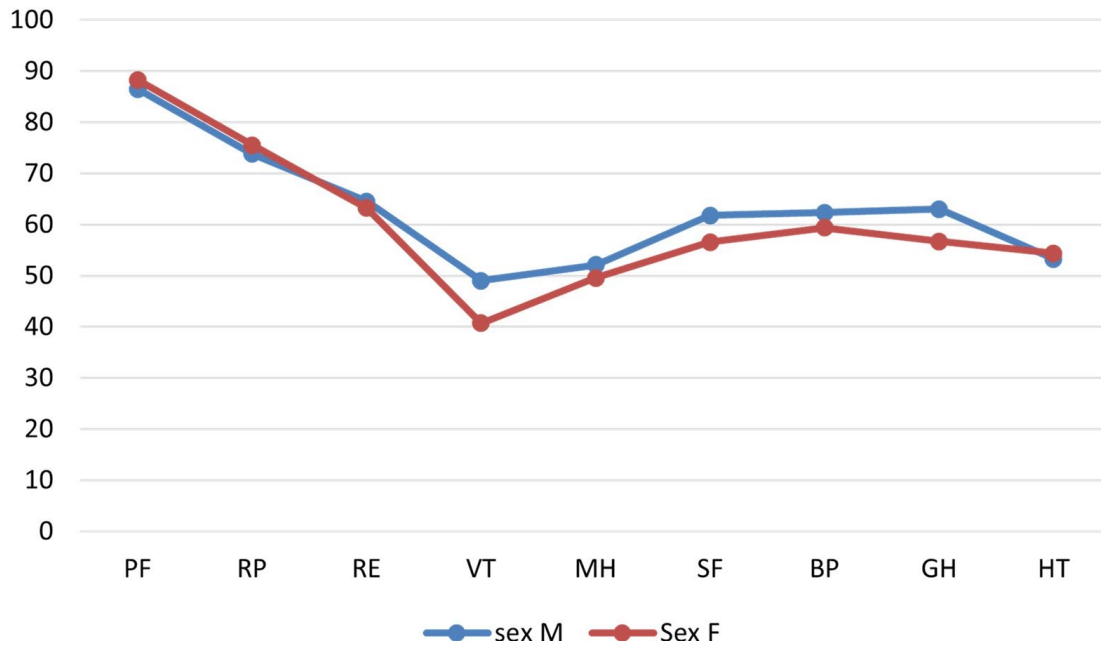

Figure 2. SF-36 scores in students with IBS by gender ($p > 0.05$).

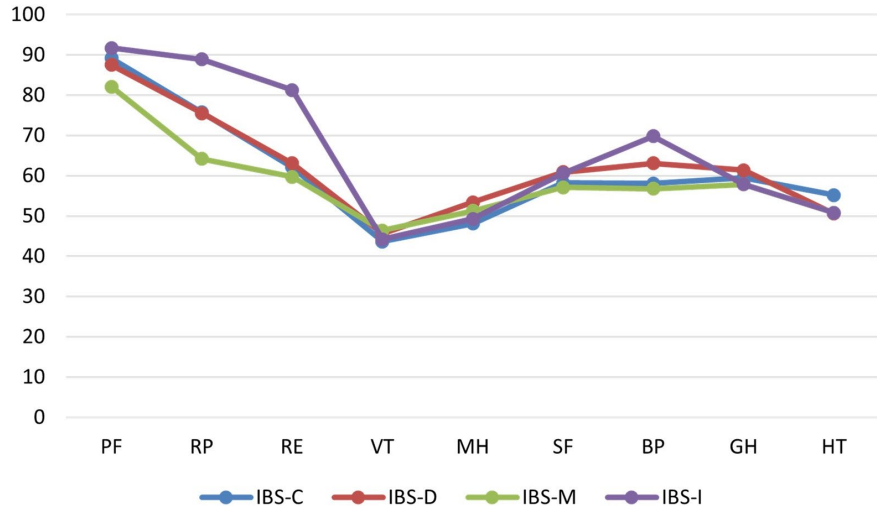

Figure 3. SF-36 score of students according to IBS subtypes ($p > 0.05$).

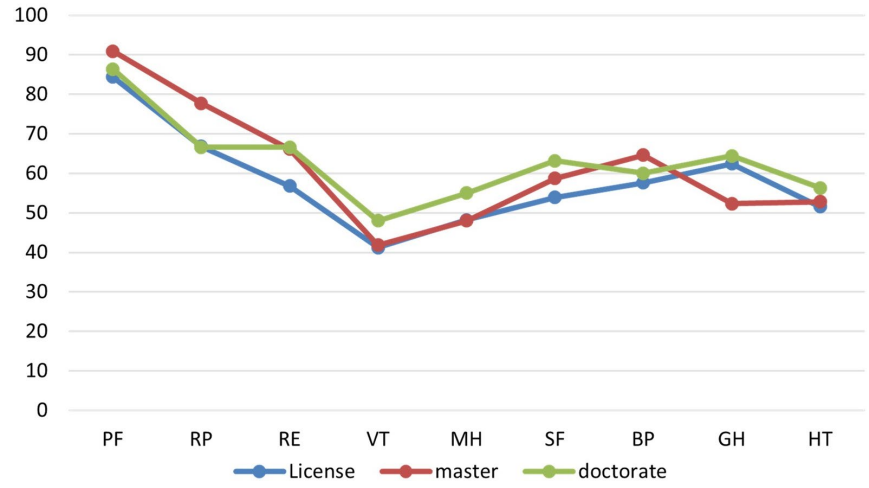

Figure 4. SF-36 score of students with IBS by level of study (*$p < 0.05$).

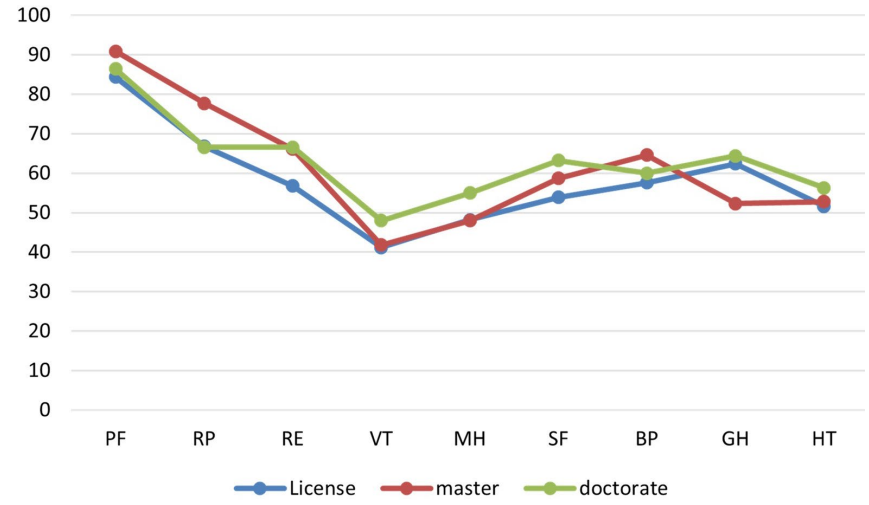

Figure 5. SF -36 score of students with IBS according to the severity of symptoms (*$p < 0.05$).

4. Discussion

Our study aimed to determine the prevalence of IBS among Ivorian medical students, to assess its severity and its impact on their quality of life. The prevalence of IBS among medical students in our study was 37.8%. This prevalence is close to those reported by Okami in Japan [11] who reported a prevalence of 35.5% among nursing and medical students and Ibrahim NK in Libya [12] who noted 31.8% of IBS among medical students and interns. However, Sehounou reported a lower prevalence of 14% among medical students in Benin [6]. This variability in prevalence could be explained by the difference in study and sampling methodology and the use of different diagnostic criteria to define IBS. In our study, students had a mean age of 23.9 ± 3 years. Our results are similar to those of Sehounou [6] and Taharboucht [13] where the average age of students diagnosed with IBS was 21.6 years ± 2.2. IBS was more observed in Doctorate 1 (D1) and Master 1 (M1) students with respective prevalence's of 31.1% and 17.9%. This can be explained by the stress generated by clinical exams for D1 students and by the combined stress that M1 students experience during both lectures and hospital training. Our results are close to those of Atidi [14] who noted the majority of IBS cases in second cycle students with a percentage of 68.7% of cases. In our study, students lived outside the family home in 78.9% of cases. This result is comparable to data from the literature [5] [15]. The most common digestive symptoms found in the study were abdominal pain (100%), diarrhea (58.9%), constipation (52.6%) and bloating (53.7%). These data are superimposable to those of Atidi in Morocco [14] and Mayindza-Ekagbha in Gabon which found abdominal pain in 100% and 99.28% of patients suffering from IBS respectively [16].

The IBS-D subtype predominated in our study with a prevalence of 38.9%. This result is comparable to those of Cassar *et al.* [17] who noted a predominance of the IBS-D subtype with a prevalence of 37.76%. However, some studies report the constipation subtype [5] [6], or the Mixed form [18] as the dominant subtype. This heterogeneity of symptoms reflects the complex pathophysiological mechanisms involved in IBS [2].

The factors significantly associated with IBS in medical students in our study were female gender ($p = 0.023$), level of study Doctorate 1 ($p = 0.036$) and stress ($p = 0.005$).

Concerning the female gender, several studies have reported a predominance of IBS in women [5] [11] [20]. In the study of Sehounou [6], female gender emerged as the independent predictor of the occurrence of IBS in multivariate analysis ($p = 0.02$, OR: 2.5).

This female predominance could be explained by their psychological profile [19]. Also, the addition of IBS symptoms to the distress encountered during the menstrual cycle could also explain the higher number of women with IBS symptoms [20].

Regarding stress, it was the most observed psychological disturbance in students suffering from IBS in our study. Indeed, physical and psychological stresses

are considered major contributing factors promoting IBS symptoms. The exact mechanism is unclear, but it is believed that changes in the central nervous system (CNS) in response to psychological and physical stressors result in colonic spasms, which leads to the manifestation of IBS symptoms [21]. Medical students are likely to be subjected to a lot of stress due to the enormous academic and hospital load [22]. A Pakistani study showed that 55.8% of the causes of IBS were associated with stress [23].

Regarding the level of study, IBS in our study significantly predominated among D1 students ($p = 0.036$), the year when students are confronted with clinical examinations. In the literature, the role of the level of study is not clearly established in the occurrence of IBS. For some authors, IBS predominates at the end of medical studies, which was attributed to the increased clinical load [12] [24]. For others, a significant predominance of IBS is observed in undergraduate students (1st, 2nd and 3rd years) and it could be related to the stresses faced by new faculty members [25].

Concerning the impact of IBS on the quality of life (QoL) of medical students, our study showed that students with IBS have lower QoL scores for all dimensions of the SF 36 compared to those observed in the general population. These results are consistent with those in the literature. Indeed, Amouretti *et al.* in France [26] reported that QoL scores of IBS patients are significantly decreased on each of the SF-36 scales compared to the general population ($p < 0.001$). Furthermore, these results were consistent with those reported by the SI *et al.* [27] in China.

In our study, quality of life scores were more impaired in female gender in vitality (VT), mental health (MH), social functioning (SF), bodily pain (BP), general health (GH), in non-significant ways. These results are consistent with those of Amourtti *et al*, who reported that women with IBS had significantly lower scores than men in all domains of SF 36 except vitality [26]. Also, Mehiz, *et al.* [5] in a similar study in Morocco reported lower quality of life scores in female gender in the domains of physical functioning (PF) and social functioning (SF), In Master's students, perceived health (GH) was significantly altered ($p = 0.005$) and those in License had role emotional (RE), social functioning (SF), bodily pain (BP) altered in a non-significant way compared to those in Master and doctorate. This difference for each level of study could be explained by the fact that students according to the level of study have a different perception of medical studies. In our study, QoL was not significantly different between the IBS-D, IBS-C, IBS-M subtypes of IBS as reported by Mehiz, *et al.* [5] and Mearin *et al.* [28]. Our study showed that QoL was significantly more altered in students with symptoms judged severe and very severe (Francis score > 250). These results agree with those of Mehiz, *et al.* [5] who reported that the perceived severity of the illness was significantly linked to reduced QoL scores concerning physical functioning (PF) ($p < 0.01$), role physical (RP) ($P < 0.05$), vitality (VT) ($p = 0.05$), mental health (MH). ($p < 0.05$), bodily pain (BP) ($p = 0.064$) and general health (GH) ($p < 0.05$). 0.001). In his study, the factors influencing physical functioning (PF) and vitality (VT) scores in multivariate analysis were symptom severity and female gender ($p < 0.001$).

5. Limitations of the Study

This study has some limitations. This study has some limitations. First, it is a single-center study that took place in a single Faculty of Medical Sciences and cannot be generalized to other faculties where socio-academic realities are different. Secondly, the survey relied on self-reported data, which may be subject to bias. Third, this study only provides a snapshot at a given point in time and does not track changes over time.

6. Conclusion

This study showed that IBS is common among medical students at the faculty of Medical Sciences of Bouake in Ivory Coast, and is significantly associated with female gender and the presence of stress. Its impact on quality of life is significant, concerns all dimensions of quality of life and is significantly associated with the severity of symptoms and level of study. These results should attract greater attention, particularly from clinicians and university managers, to help these students cope with IBS and develop supportive environments to reduce the psychological and physical effects of symptoms

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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