Journal of Clinical and Nursing Research, 2026, Volume 10, Issue 8
https://www.bbwpublisher.com/journal/JCNR
Online ISSN: 2208-3693
Print ISSN: 2208-3685

Investigation on Prevalence Status and Related Factors of Irritable Bowel Syndrome Among Students in Medical Vocational Colleges in Guangxi

Lan Huang, Guiqiong Huang

Guangxi Health Vocational and Technical College, Nanning 530021, Guangxi, China

Abstract: *Objective*: To investigate the prevalence status and related risk factors of irritable bowel syndrome (IBS) among freshmen of a medical vocational college in Guangxi. *Methods*: A cross-sectional design was adopted. Cluster sampling was used to recruit all freshmen of the college. Self-designed questionnaires were distributed through Wenjuanxing. The Rome IV criteria were applied for IBS screening. Chi-square test was used for enumeration data, and *t*-test for measurement data. Variables with $p < 0.05$ in univariate analysis were included in multivariate binary Logistic regression. *Results*: A total of 4 729 valid questionnaires were recovered, among which 62 cases were screened positive, with a prevalence rate of 1.31%. The positive screening rate was higher in females than in males ($p = 0.029$). Mixed-type (50.0%) and diarrheal-type (46.8%) were the main subtypes, while constipation-type accounted for 3.2%. Moderate-to-severe symptoms were found in 30.6% of positive cases. Multivariate analysis showed that female gender (OR = 2.453, 95% CI: 1.098–5.479), coarse-grain-based staple food (OR = 3.709, 95% CI: 1.523–9.032), preference for acidic food (OR = 2.466, 95% CI: 1.303–4.669), preference for spicy food (OR = 2.003, 95% CI: 1.206–3.325), and frequent consumption of pickled food (OR = 4.101, 95% CI: 2.012–8.361) were independent risk factors. *Conclusion*: The prevalence of IBS among freshmen medical students in this college is relatively low. Female gender and high-irritant diets are core influencing factors.

Keywords: Irritable bowel syndrome; Rome IV diagnostic criteria; Epidemiological investigation; Medical students; Risk factors

Online publication: Aug 31, 2026

1. Introduction

Irritable bowel syndrome (IBS) is the most common functional intestinal disorder in clinical practice. Its major manifestations are recurrent abdominal pain accompanied by altered bowel habits or stool properties, and organic lesions have been excluded by examinations [1]. Its symptoms linger and recur, continuously

impairing patients' quality of life [2].

Issued in 2016, the Rome IV criteria are stricter compared with Rome III: simple abdominal discomfort is removed as a diagnostic basis; abdominal pain is listed as an essential symptom, which should occur at least once per week in the past 3 months. The prevalence determined by Rome IV decreases by approximately 7.5% compared with Rome III [3].

The pathogenesis of IBS has not been fully elucidated. Visceral hypersensitivity, intestinal dysmotility, low-grade intestinal mucosal inflammation, intestinal flora imbalance and abnormal brain-gut-axis regulation constitute its core pathways. Epidemiological studies show obvious gender differences in IBS, with females having higher risk than males, and the male-to-female ratio is about 1:2-1:5 [4,5]. Estrogen can regulate brain-gut-axis functions through multiple pathways and raise intestinal pain sensitivity. In addition, low-FODMAPs diets can effectively relieve IBS symptoms [6].

Medical students are under long-term high-intensity academic pressure, and commonly suffer from disordered daily schedules and imbalanced dietary structures, making them a high-risk group for functional gastrointestinal diseases. Based on the Rome IV criteria, this cross-sectional survey was carried out among freshmen of a medical vocational college in Guangxi. It aims to describe the prevalence and clinical subtypes of IBS, identify independent risk factors, and provide references for gastrointestinal-health-related health education and stratified prevention-and-control in colleges.

2. Subjects and methods

2.1. Research subjects

A cross-sectional prevalence survey was conducted on all full-time freshmen of Guangxi Health Vocational and Technical College.

2.1.1. Inclusion criteria:

(1) Full-time freshmen enrolled in January 2025;
(2) Voluntary participation;
(3) Capable of independently completing online questionnaires.

2.1.2. Exclusion criteria:

(1) Diagnosed with inflammatory bowel disease, peptic ulcer, hepatobiliary-pancreatic organic lesions, severe mental-psychological disorders or major physical illnesses;
(2) Random answers to questionnaires or massive missing key items.
Finally, 4 729 valid questionnaires were included.

2.2. Sampling method

Cluster sampling was adopted. All freshman administrative classes were taken as sampling clusters, and a full-coverage survey was conducted on every student in each class.

2.3. Survey instruments and contents

A self-compiled structured electronic questionnaire was developed with the Rome IV criteria as the core framework, revised by experts, and released on the Wenjuanxing platform after pre-investigation. Contents

include:

(1) Demographic-sociological information (gender, age, ethnicity, etc.);

(2) IBS clinical symptoms and diagnostic items (abdominal pain, abdominal distension, defecation abnormalities, extra-intestinal accompanying symptoms, alarm symptoms, endoscopy and medical-consultation history);

(3) Risk factors (family history of gastrointestinal diseases, tobacco-alcohol-tea-drinking habits, dietary factors). Daily staple foods were divided into three categories: rice-based, wheat-flour-based, and coarse-grain-based (coarse grains such as corn, sweet potato and oats account for ≥50% of staple-food intake).

2.4. Screening criteria

Positive IBS screening followed the Rome IV criteria: recurrent abdominal pain in the past 3 months occurring at least once per week on average, plus no less than 2 of the following items:

(1) Abdominal pain related to defecation;

(2) Abdominal pain accompanied by altered defecation frequency;

(3) Abdominal pain accompanied by altered stool properties.

Alarm symptoms and endoscopy history were used to exclude organic diseases. This is a self-administered questionnaire-based cross-sectional survey. Positive screening results do not equal clinical definite diagnosis.

2.5. Survey implementation and quality control

Before the survey, class assistants received unified training on filling specifications and criterion interpretation. Students scanned QR codes to submit anonymous answers in class collectively. Research purposes and confidentiality principles were explained uniformly. Logical verification and mandatory-item interception were enabled in the questionnaire backend. Unqualified questionnaires were eliminated by manual review, and data were cross-checked by two operators on two separate devices.

2.6. Statistical methods

Data were imported into SPSS 26.0 for analysis. Enumeration data were described by case number and constituent ratio (%). Chi-square test or Fisher's exact test was adopted for inter-group comparison. Measurement data conforming to normal distribution were expressed as mean ± standard deviation. Variables with $p < 0.05$ in univariate analysis were incorporated into multivariate binary Logistic regression (Enter method). The test level α was set at 0.05.

3. Results

3.1. Basic profile of survey subjects

A total of 4 729 freshman medical students were enrolled, among whom 62 were screened positive, with a prevalence rate of 1.31%. The mean age of the positive group was (19.1 ± 1.2) years old, and that of the negative group was (18.9 ± 1.1) years old. No statistically significant difference was found ($p = 0.156$).

3.2. Comparison of demographic data

Statistically significant differences were found in gender distribution and family history of gastrointestinal diseases between the two groups (all $p < 0.05$). See **Table 1**.

Table 1. Comparison of general demographic data between the two groups

Item	Positive group (n = 62)	Control group (n = 4 667)	Statistical value	*p* value
Gender				
Female	55(88.71)	3 546(75.98)	$\chi^2 = 4.780$	0.029
Male	7(11.29)	1 121(24.02)		
Family history of gastrointestinal diseases				
Yes	9(14.52)	337(7.22)	$\chi^2 = 8.325$	0.016
No	38(61.29)	3 432(73.54)		

Note: Enumeration data are expressed as case (%).

3.3. Comparison of lifestyle and dietary behaviors

Statistically significant differences existed between the two groups in daily staple-food types, preference for acidic food, preference for spicy food and intake frequency of pickled food (all $p < 0.05$). No significant differences were observed in smoking, alcohol drinking, tea drinking or seafood intake frequency (all $p > 0.05$). See **Table 2**.

Table 2. Comparison of lifestyle and dietary-behavior data between the two groups

Item	Positive group(n = 62)	Control group (n = 4 667)	χ^2 value	*p* value
Daily staple food				
Rice-based	44(70.97)	3 821(81.87)		
Wheat-flour-based	12(19.35)	722(15.47)	12.455	0.002
Coarse-grain-based	6(9.68)	124(2.66)		
Preference for acidic food				
Occasional consumption	39(62.90)	2 773(59.42)	14.757	< 0.001
Frequent consumption	13(20.97)	414(8.87)		
Preference for spicy food				
Occasional consumption	26(41.94)	2 257(48.36)	8.300	0.016
Frequent consumption	30(48.39)	1 510(32.35)		
Intake of pickled food				
Occasional consumption	36(58.06)	2 974(63.72)		
Frequent consumption	10(16.13)	187(4.01)	22.686	< 0.001
Rare / no consumption	16(25.81)	1 506(32.27)		

Note: Data are expressed as case (%).

3.4. Clinical subtypes and symptom severity

Mixed-type (50.0%) and diarrheal-type (46.8%) were the main subtypes, while constipation-type accounted for 3.2%. Moderate-to-severe symptoms occurred in 30.6% of positive subjects.

3.5. Multivariate analysis

Gender, family history of gastrointestinal diseases, daily staple-food types, preference for acidic food, preference for spicy food and intake frequency of pickled food were included in multivariate binary Logistic regression. The overall model was statistically significant ($\chi^2 = 42.900$, $p < 0.001$). Female gender, coarse-grain-based staple food, preference for acidic food, preference for spicy food and frequent consumption of pickled food were independent risk factors (all $p < 0.05$). Family history showed no statistical significance ($p = 0.119$). See **Table 3**.

Table 3. Multivariate logistic regression analysis of influencing factors for positive IBS screening

Variable	*p* value	OR	95% CI
Female	0.029	2.453	1.098–5.479
Family history	0.119	1.789	0.860–3.719
Coarse-grain-based staple food	0.004	3.709	1.523–9.032
Preference for acidic food	0.006	2.466	1.303–4.669
Preference for spicy food	0.007	2.003	1.206–3.325
Pickled-food intake	< 0.001	4.101	2.012–8.361

Note: Model $\chi^2 = 42.900$, $p < 0.001$, Nagelkerke $R^2 = 0.141$.

4. Discussion

4.1. Prevalence and diagnostic criteria

The positive screening rate of IBS in this study was 1.31%, lower than most survey results from domestic universities. Possible reasons are as follows:

(1) The Rome IV criteria set higher thresholds, and about half of mild cases diagnosed by Rome III cannot be included [3];

(2) Freshmen have not yet entered high-intensity professional-study stages with low stress load;

(3) Medical students possess good health literacy and give relatively objective symptom reports. It should be emphasized that 1.31% refers to screening-positive rate rather than clinical confirmed prevalence. Some screened-positive subjects may suffer from other diseases such as functional dyspepsia.

4.2. Gender difference

The positive screening rate was significantly higher in females. Multivariate analysis confirmed female gender as an independent risk factor (OR = 2.453), consistent with domestic and international findings [4,5]. Estrogen can interfere with brain-gut-axis homeostasis via multiple pathways and raise intestinal pain sensitivity, while androgen exerts protective effects [5,7]. G-protein-coupled estrogen receptors are up-regulated in IBS patients, which are associated with mast-cell activation and intestinal-muscle contraction [8]. Moreover, estrogen can alter intestinal-microbiota abundance. Females show more sensitive immune responses and are prone to intestinal inflammation after exposure to irritants [5,8].

4.3. Dietary factors

Multivariate analysis indicated that acidic food (OR = 2.466), spicy food (OR = 2.003), pickled food (OR = 4.101) and coarse-grain-based staple food (OR = 3.709) were independent risk factors. Spicy and

highly-acidic food can activate the TRPV1 channel and trigger visceral hypersensitivity. High salt and nitrites in pickled food may damage intestinal-mucosa barriers and reshape microbiota structure [6]. Coarse grains are rich in FODMAPs. After intake by susceptible populations, bacterial fermentation produces gas and may induce abdominal distension and abdominal pain [6,9]. Nevertheless, coarse grains still provide dietary-fiber benefits for ordinary people, and individualized assessment should be emphasized in clinical practice.

4.4. Psychological stress and brain-gut axis

IBS is a disorder caused by bidirectional dysregulation of the brain-gut axis. Psychological stress can aggravate visceral hypersensitivity. Medical students are under heavy academic pressure. Most cases in this study were accompanied by extra-intestinal symptoms such as insomnia and fatigue, which confirms the important role of psychological stress.

4.5. Family history

Univariate analysis showed higher screening-positive rate among subjects with positive family history ($p = 0.016$), while no statistical significance was obtained in multivariate analysis ($p = 0.119$). It suggests that family history may indirectly affect morbidity through mediating variables such as dietary behaviors, or it may be related to insufficient positive-case sample size.

4.6. Clinical subtypes and interventions

Mixed-type (50.0%) and diarrheal-type (46.8%) predominated, and constipation-type was rare, which matches the subtype characteristics of Chinese adolescents. Moderate-to-severe symptoms occurred in 30.6% of patients, so the disease burden cannot be ignored. There is no radical cure for IBS. The core of intervention lies in long-term self-management, including low-FODMAPs diets, regular physical exercise and emotional counselling [6,9]. Colleges should incorporate functional-gastrointestinal-disease health education into freshman orientation education, optimize canteen menus to reduce high-irritant food supply, set up psychological-counseling courses, advocate no less than 2 hours of physical exercise per week, and conduct regular screening for high-risk groups.

4.7. Limitations

This study adopts cross-sectional questionnaire screening; screening positivity does not equal clinical confirmation. Subjects are limited to freshmen, so external generalization is restricted. Self-reporting may bring recall bias. The high threshold of Rome IV criteria may underestimate the prevalence of mild cases.

5. Conclusion

The IBS screening-positive rate of freshmen medical students in this college under Rome IV criteria is 1.31%. Females have significantly higher risk, and mixed-type and diarrheal-type are major subtypes. Female gender, coarse-grain-based staple food and high-irritant diets (acidic, spicy and pickled food) are independent risk factors. It is suggested that colleges carry out targeted health education, implement comprehensive intervention combining dietary adjustment, psychological counseling and regular exercise, and refer screening-positive subjects to specialized departments for definite diagnosis in a timely manner.

Disclosure statement

The authors declare no conflict of interest.

References

[1] Drossman D, 2016, Functional Gastrointestinal Disorders: History, Pathophysiology, Clinical Features and Rome IV. Gastroenterology, 150(6): 1262–1279.

[2] Cooperative Group for Functional Gastrointestinal Diseases, Division of Gastroenterology, Chinese Medical Association, Gastrointestinal Motility Group, Division of Gastroenterology, Chinese Medical Association, 2020, Chinese Expert Consensus on Irritable Bowel Syndrome (2020). Chinese Journal of Digestion, 40(12): 803–818.

[3] Wang Q, Jia L, 2025, Research Progress of Irritable Bowel Syndrome Under Rome IV Criteria. Journal of Chronic Diseases, 26(9): 1321–1324.

[4] He H, Zhang Z, Zhang Q, et al., 2024, Analysis of Research Status on Gender Differences in Patients with Irritable Bowel Syndrome. China Medical Science, 14(18): 18–21.

[5] Wang Y, Chang J, Yang X, et al., 2023, Research Progress on the Effects of Estrogen and Its Receptors on Irritable Bowel Syndrome. International Journal of Digestive Diseases, 43(6): 359–362.

[6] Bei Q, Han C, Xu Y, et al., 2022, Research Progress on Dietary Intervention Strategies for Patients with Irritable Bowel Syndrome. Science and Technology of Food Industry, 43(16): 421–431.

[7] Wu K, Xiao J, Sun W, 2023, Research Progress on Related Mechanisms of Sex Hormones in the Pathogenesis of Irritable Bowel Syndrome. Modern Medicine & Health, 39(3): 471–476.

[8] Damian J, M K, 2020, Significance of G Protein-Coupled Estrogen Receptor in the Pathophysiology of Irritable Bowel Syndrome, Inflammatory Bowel Diseases and Colorectal Cancer. Frontiers in Endocrinology, 11: 390.

[9] Jiang H, Xie Z, Dong C, 2023, Summary of Best Evidence for Self-Management in Patients with Irritable Bowel Syndrome. Journal of Wenzhou Medical University, 53(12): 992–999.