

Influence of lifestyles on the prevalence of gastrointestinal disorders in medical students.

Influencia de los estilos de vida en la prevalencia de trastornos gastrointestinales en estudiantes de medicina.

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Summary:

Objective: This research explores the relationship between university students' lifestyles and the prevalence of gastrointestinal disorders, identifying key factors that allow for the development of intervention strategies to improve the health of medical students. **Design/Methodology/Approach:** The research adopted a quantitative and descriptive-correlational approach. A survey designed to assess lifestyles and gastrointestinal disorders was applied to 251 medical students, selected in a stratified manner, during the period April-August 2024. The analysis included correlation tests to examine the association between variables. **Results/Discussion:** The data showed a high prevalence of gastrointestinal disorders, associated with unhealthy lifestyles. The main factors identified were inadequate eating habits and poor stress management. The statistical analysis reflected a medium association ($p < 0.05$) between unhealthy lifestyles and gastrointestinal disorders, confirming a significant relationship between both variables. These results highlight the need for interventions that promote better habits in the student community. **Conclusions:** Unhealthy lifestyles significantly influence the prevalence of gastrointestinal disorders. Health promotion programs are recommended to reduce the incidence of these conditions and improve student well-being. **Originality:** This study provides evidence on the relationship between lifestyles and gastrointestinal disorders in university students, an underexplored area in Ecuador. Its findings can guide health policies and preventive programs in higher education institutions.

Keywords: gastrointestinal disorders, lifestyles, medical students, public health .

Resumen:

Objetivo: La investigación explora la relación entre los estilos de vida de los estudiantes universitarios y la prevalencia de trastornos gastrointestinales, identificando factores clave que permitan generar estrategias de intervención para mejorar la salud de los estudiantes de medicina. **Diseño/Metodología/Enfoque:** La investigación adoptó un enfoque cuantitativo y descriptivo-correlacional. Se aplicó una encuesta diseñada para evaluar estilos de vida y trastornos gastrointestinales a 251 estudiantes de medicina, seleccionados de forma estratificada, durante el periodo abril-agosto 2024. El análisis incluyó pruebas de correlación para examinar la asociación entre variables. **Resultados/Discusión:** Los datos mostraron una alta prevalencia de trastornos gastrointestinales, asociados con estilos de vida no saludables. Los principales factores identificados fueron hábitos alimenticios inadecuados y una deficiente gestión del estrés. El análisis estadístico reflejó una asociación media ($p < 0,05$) entre estilos de vida poco saludables y trastornos gastrointestinales, confirmando una relación significativa entre ambas variables. Estos resultados destacan la necesidad de intervenciones que promuevan mejores hábitos en la comunidad estudiantil. **Conclusiones:** Los estilos de vida no saludables influyen significativamente en la prevalencia de trastornos gastrointestinales. Se recomienda implementar

programas de promoción de la salud para reducir la incidencia de estas afecciones y mejorar el bienestar de los estudiantes. **Originalidad:** El estudio aporta evidencia sobre la relación entre estilos de vida y trastornos gastrointestinales en estudiantes universitarios, un área poco explorada en Ecuador. Sus hallazgos pueden guiar políticas de salud y programas preventivos en instituciones de educación superior.

Palabras clave: trastornos gastrointestinales, estilos de vida, estudiantes de medicina, salud pública.

1. Introduction

The health of university students is influenced by multiple factors of complex etiology, including social, cultural, academic, and behavioral determinants. Many of these factors are expressed in voluntary behaviors known as lifestyles, which play a central role in the onset and progression of various pathologies. Lifestyle is defined as the set of observable behavioral patterns in an individual's daily life, determined by the interaction of personal, social, economic, and environmental factors. It is considered healthy when it includes practices such as a balanced diet, regular physical activity, good stress management, and abstinence from the use of harmful substances such as alcohol and tobacco (1).

In the university context, student lifestyles, frequently characterized by poor eating habits, a sedentary lifestyle, and high levels of academic stress, constitute a significant risk factor for the development of gastrointestinal disorders. These conditions not only compromise the functioning of the digestive system but also negatively affect the quality of life, academic performance, and overall well-being of young people. Gastrointestinal disorders include a wide spectrum of pathologies that affect the structure and function of the digestive system, triggered by infections, medication use, or dietary factors (2). Recent studies have described an increase in the incidence of these pathologies among higher education students, positioning them as a growing public health problem. Adolescence and young adulthood are critical stages for establishing lasting habits that directly impact future health. A healthy lifestyle during these phases facilitates not only social and emotional development, but also the acquisition of skills for adult life. This adaptation process is especially challenging upon entering university, a time when students face new academic, social, and personal demands (3). Proper nutrition and lifestyle are essential for the comprehensive development of young people, enabling them to effectively cope with changes in their environment and strengthening their integration into society (4). Therefore, higher education institutions should not limit themselves to their educational role, but should also assume an active responsibility for health promotion, both in the institutional environment and in the daily lives of students.

Empirical evidence supports this need; a study conducted on university students aged 18 to 30 in Costa Rica concluded that inappropriate eating habits represent a determining factor for the appearance of gastrointestinal diseases, exacerbated by factors such as academic stress, consumption of psychoactive substances and poor time management (5). Along the same lines, the World Health Organization (WHO, 2016) estimates that approximately 1.5 billion cases of gastrointestinal diseases are recorded each year, with a greater burden in developing countries, where they contribute significantly to global morbidity and mortality (6). On the other hand, studies conducted on university students in South Korea showed a significant prevalence of gastrointestinal disorders, being 18.5% for gastroesophageal reflux disease, 7.5% for functional dyspepsia and 6.5% for irritable bowel syndrome. Likewise, several risk factors associated with these pathologies were identified, among which the low frequency of physical activity (less than once a week), irregular food intake, excessive food consumption more than five times a week and the presence of high levels of academic stress stand out (7).

From this context, the present research aims to analyze the relationship between lifestyle and the prevalence of gastrointestinal disorders in medical students at the National University of Chimborazo (UNACH), during the period April-August 2024. The scarcity of specific studies in this population justifies the need to delve deeper into this phenomenon, with the aim of generating evidence that allows the design of intervention strategies aimed at promoting healthy lifestyles and preventing gastrointestinal diseases in the university environment.

2. Methods

The proposed research methodology is empirical and quantitative, focused on examining the relationship between lifestyle and the prevalence of gastrointestinal disorders in medical students at UNACH. It is based on the analysis of data collected through a survey specifically designed for this study, which allows the generation of quantifiable data that will be interpreted to clarify this relationship. From this perspective, the scope of the study is descriptive and correlational. From the descriptive approach, the characteristics and concepts of the study variables are identified and described, providing a clear overview of the context and observed phenomena. In the correlational approach, the relationship between lifestyle and gastrointestinal disorders is explored, allowing an understanding of the dimensions of this problem without inferring direct causality between the variables (8). The defined variables are: lifestyle as the independent variable and gastrointestinal disorders as the dependent variable. Thus, the objective is to determine whether there is a significant relationship between lifestyle and gastrointestinal disorders, with the objective of measuring and understanding the degree of relationship and its relevance within the study group.

The research design is non-experimental and cross-sectional. In this approach, variables are not manipulated but rather observed in their natural environment, allowing for a genuine analysis of the phenomena. Being cross-sectional, data collection is conducted at a single point in time, providing an accurate snapshot of the context studied. This type of design is ideal for descriptive and correlational studies, where the objective is to understand reality as it exists, without research intervention. The study participants were recruited at the Edison Riera campus of the National University of Chimborazo (UNACH), located at Av. Antonio José de Sucre, Km. 1 1/2, Riobamba-Guano road, in the city of Riobamba, Chimborazo province. This campus is the largest at UNACH and houses three of the institution's four faculties, as well as the administrative offices of the rector's office, the Academic and Administrative Vice-Rector's offices, and various departments that support institutional management. For this analysis, the research focused on the first semester of 2024 (April-August), covering a finite population of 718 students enrolled in the Medicine program. The students, aged between 17 and 35, come from various regions of Ecuador, but all attend their studies in person at UNACH in the city of Riobamba, Ecuador (9).

Table 1 facilitates a quick and effective understanding of the criteria that determine the eligibility of participants for research, ensuring that all those included in the study meet the necessary conditions for adequate and representative participation.

Table 1. Inclusion and Exclusion Criteria

Inclusion Criteria	Exclusion Criteria
1. Students of any religion, marital status, origin.	1. Students who do not agree to participate voluntarily.
2. Students enrolled in the medical degree.	2. Students who are not enrolled in the medical program.
3. University students willing to participate voluntarily and who have signed the informed consent form.	3. Students who are visitors or on exchange programs.
4. Students who complete 100% of the surveys.	4. Students who do not complete 100% of the surveys.
	5. Students who are taking pre-professional internships or rotating internships

The student population was sampled with a 95% confidence level ($Z=1.96$) and a 5% margin of error, based on a population size of 718 students. A sample of 251 students was obtained. Stratified sampling was then applied for each of the 10 semesters of the program, excluding students in pre-professional internships or rotating internships. This approach ensures an accurate representation of each semester, optimizing the validity of the results and minimizing bias in the estimation of population parameters.

The research technique for data collection was a survey administered to students who met the established selection criteria and those who were willing to participate in the data collection process (10). The data

collection instruments used for information gathering were two questionnaires, the first related to lifestyle and the second to gastrointestinal health in medical students (11), administered using the survey technique that allowed for efficient information collection. The most important aspects of the instruments are summarized below:

Lifestyle Instrument (FIFO-1):

It consists of 10 general information questions and 55 questions classified into five dimensions: eating habits, sleeping habits, psycho-emotional aspects, physical exercise habits, toxic habits, and health care. Responses are ordinal (never, sometimes, often, always) and are scored from 1 to 4. A distinction is made between healthy lifestyles (high scores) and unhealthy ones (low scores). Each dimension has a specific scoring range to determine whether the lifestyle is healthy or unhealthy.

Gastrointestinal Disorders Instrument:

Based on the ICD-10.ES and modified by Miraval-Guibarra in 2017 (12). It is designed to identify the presence of gastrointestinal disorders in nursing students. It consists of 26 items and other informative data. The presence of disorders is determined if a student presents three or more symptoms; fewer than three is considered the absence of disorders. Both instruments seek to assess students' lifestyle and critical aspects of health, providing a framework for identifying areas that may require intervention or additional support.

To ensure the instrument's reliability, a pilot test was conducted with 20 medical students. This preliminary stage is crucial for evaluating the effectiveness and appropriateness of the data collection tools before their large-scale implementation. The pilot sample allows for the identification and correction of potential errors in the questionnaire design, adjustment of ambiguous questions, and validation of the instrument's structure and consistency. Furthermore, this test facilitates the estimation of response times and the evaluation of the clarity of the instructions. Making these adaptations based on the pilot test results significantly improves the reliability and accuracy of the data to be collected in the main phase of the research. Table 2 presents the Cronbach's alpha coefficients for two variables studied; these coefficients are indicators of the reliability of the measurement instruments used in the research. The instruments demonstrate adequate reliability for use in subsequent studies, with a level of internal consistency that allows confidence in the measurements made on lifestyle and gastrointestinal disorders in the student sample.

Table 2. Cronbach's Alpha Coefficient for the identified population

Variables	Reliability statistics	
	Cronbach's alpha	Number of elements
Lifestyle	0.752	55
Gastrointestinal Disorders	0.807	26

The procedure followed established research protocols; the study is part of the project "Epidemiological profile of UNACH faculty and students," which was approved by the Research and Outreach Steering Committee (10). With the authorization of the program director, physical questionnaires were administered to a selected sample of students. The questionnaires were administered guaranteeing confidentiality and the confidential handling of the data, and their cooperation was free and voluntary. The collected data were processed using Excel and SPSS (Statistical Package for the Social Sciences) version 26. Both descriptive and inferential statistical techniques were used to consolidate the study objectives. Descriptive analyses included frequency tables, while inferential analyses used cross-tabs and correlation statistics, specifically using the Chi-square correlation coefficient to examine the relationships between variables. The results were presented in graphs and statistical tables and interpreted in line with the study objectives and hypotheses (13).

3. Results

Figure 1 presents the distribution of students according to the calculated sample, consisting of a total of 251 students in the Medicine program at the National University of Chimborazo (UNACH), proportionally stratified by academic semester for the period April-August 2024. The variability observed between semesters is significant: the fifth semester concentrates the highest proportion of sampled students (n=38), while the eighth semester reports the lowest (n=12). This heterogeneity may reflect differentiated patterns of retention, curricular advancement, or even academic lag. In particular, the lower proportion of students in the first semesters could indicate lower rates of recent admission or high initial dropout rates, while the middle semesters show a higher concentration, possibly associated with greater academic stability. These findings are fundamental for academic planning, the efficient allocation of resources, and the design of institutional strategies aimed at improving student trajectory and retention in the Medicine program.

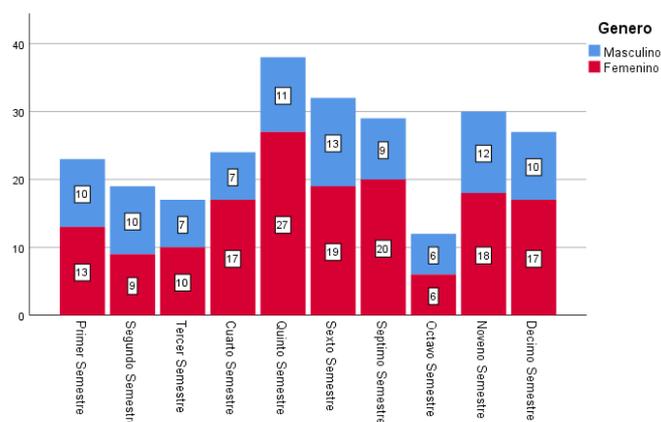


Figure 1. Medical students by semester and gender (Male: masculino; Female: femenino). Source: Secretary of the Unach Medical School (2024)

Lifestyles of medical students

The students' lifestyles were assessed according to the definitions established during the study's instrument design and data collection methodology. The assessment allows for a detailed analysis of the "lifestyle" variable, which is essential for understanding how daily practices impact students' health. Based on these data, statistical analysis is conducted using methods that allow us to discern significant patterns and associations between lifestyles and their influence on participants' physical and mental health. This approach provides a solid basis for identifying risk or protective factors that may be crucial in developing interventions aimed at improving the well-being of this population.

Table 3. Healthy and unhealthy lifestyle habits in medical students

Lifestyles	Healthy	%	Unhealthy	%
Eating Habits	202	81	49	19
Sleep Habits	206	82	45	18
Psycho-emotional aspects	137	55	114	45
Physical exercise habits	181	72	70	28
Toxic Habits	231	92	20	8
Health Care Habits	65	26	186	74

Table 3 presents the lifestyles of medical students in relation to various health aspects. The vast majority practice healthy eating habits (81%) and sleeping habits (82%), indicating a high awareness of these fundamental aspects for their well-being. Regarding psycho-emotional aspects, only 55% report having a healthy lifestyle, while 45% do not, highlighting an area of significant concern in their mental and social health. Similarly, 72% of students adhere to healthy physical exercise habits, although 28% could benefit from

increased physical activity. A high percentage (92%) also avoid unhealthy habits, suggesting a heightened awareness of the risks of such practices. The main concern is observed in healthcare, where only 26% follow healthy practices and an alarming 74% do not, which could indicate barriers or lack of interest in maintaining appropriate healthcare routines. These results underscore the need to focus interventions on improving psychosocial aspects and general health care in the medical student population to foster a holistic approach to well-being.

Table 4 presents a summary of the healthy and unhealthy lifestyles of the 251 medical students. The results are encouraging, showing that a large majority, 82% (206 students), adopt a healthy lifestyle. On the other hand, 18% (45 students) follow lifestyles considered unhealthy. This high percentage of healthy behaviors reflects a good adoption of health-promoting practices among future medical professionals, which is positive, considering that these students can influence the health of their future patients. However, the 18% who do not follow a healthy lifestyle need attention. Thus, while the majority of students are well aligned with healthy practices, there is still significant room for improvement and increase of health and wellness initiatives within the medical student community.

Table 4. Prevalence of lifestyle in medical students

Lifestyles	Frequency	%
Healthy	206	82
Unhealthy	45	18
TOTAL	251	100

Gastrointestinal disorders

Figure 2 provides a detailed breakdown of the prevalence of various gastrointestinal symptoms in medical students, using data from a total sample of 251 students. The results show that abdominal pain and heartburn are the most prevalent symptoms among medical students, while regurgitation and gastroesophageal reflux are less common. These findings are important for understanding the prevalent health problems in this population and can inform intervention and prevention strategies aimed at improving the gastrointestinal health of medical students.

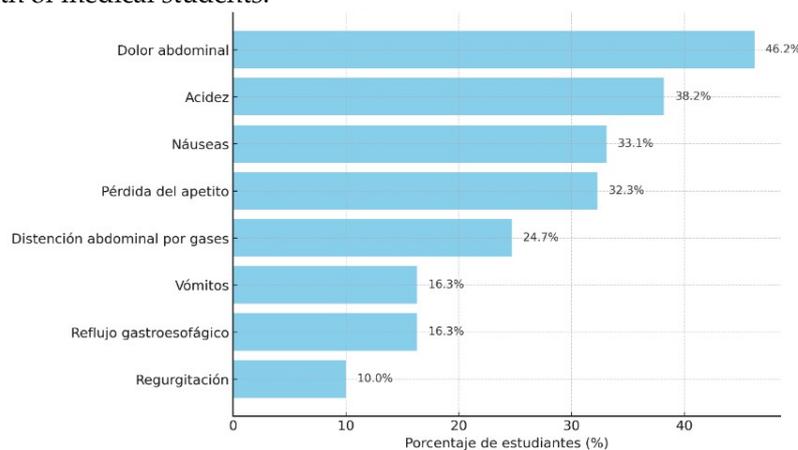


Figure 2. Prevalence of gastrointestinal symptoms in medical students.

Figure 3 summarizes the prevalence of various gastrointestinal diseases. These findings indicate that serious gastrointestinal illnesses are rare in this population. Gastritis is relatively more prevalent, which could suggest an area of interest for future health interventions or research in this specific group. The low prevalence of more serious conditions such as gastric ulcer and pancreatitis highlights the absence of widespread acute gastrointestinal problems among students.

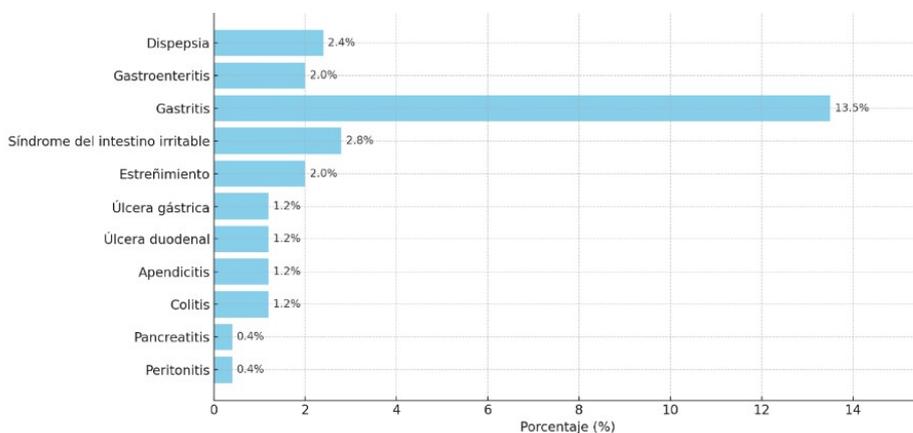


Figure 3. Frequency of diseases associated with gastrointestinal disorders presented by students

Table 6 shows that a high proportion of medical students, specifically 80.5% (202 of 251), report the presence of gastrointestinal disorders. In contrast, only 19.5% (49 of 251) of students report not experiencing these problems. This high percentage of affected individuals highlights a worrying prevalence of gastrointestinal disorders among future healthcare professionals. The significant presence of these disorders underscores the need for interventions aimed at improving eating habits and stress management in this population, as well as for implementing more effective wellness programs in medical school. This study first explores the relationship between eating habits and gastrointestinal disorders in medical students. First, it was established that both variables are categorical, allowing for the use of chi-square (X^2) analysis to investigate their association. A prerequisite for applying this analysis is that the expected count in each cell of the contingency table must be at least five, demonstrating that both variables are independent of each other. This criterion was met, indicating that the data are suitable for the proposed analysis. The X^2 results revealed a significant relationship between lifestyles and gastrointestinal disorders (Table 7). To measure the strength of this association, the 2x2 symmetric Phi test for nominal variables was used, which confirmed the existence of a statistically significant medium association. In addition, a directional analysis using the Lambda test was performed to determine the predictive capacity of the independent variable, in this case, lifestyles, on the dependent variable: gastrointestinal disorders. This approach provides a deeper understanding of how eating habits can influence students' gastrointestinal health. The results show that lifestyles have a significant impact on students' gastrointestinal health. Improving eating, sleeping, and exercise habits could contribute to reducing the prevalence of these disorders in the study population.

Table 6. Situation of gastrointestinal disorders in medical students

Gastrointestinal Disorders	Frequency	%
Presents	202	80.5
Missing	49	19.5
TOTAL	251	100

Table 7. Hypothesis testing of lifestyle habits and their relationship with gastrointestinal problems.

Lifestyles	Gastrointestinal Disorders				Total %	X2	P	Phi	Assoc iation	
	Missing		Present							
	No.	%	No.	%						
Food Habits	Unhealthy	49	19.5	0	0.0	19.5	101.23	0.00	0.637	Strong
	Healthy	45	17.9	157	62.5	80.5				
Sleep Habits	Unhealthy	45	17.9	0	0.0	17.9	91.58	0.00	0.604	Strong
	Healthy	49	19.5	157	62.5	82.1				
Psycho-emotional aspects	Unhealthy	49	19.5	65	25.9	45.4	2.73	0.12	0.104	Weak
	Healthy	45	17.9	92	36.7	54.6				
Physical Exercise Habits	Unhealthy	45	17.9	25	9.97	27.8	41.45	0.02	0.480	Avera ge
	Healthy	49	19.5	132	52.7	72.2				
Toxic Habits	Unhealthy	20	8.0	0	0.0	8.0	36.29	0.00	0.380	Avera ge
	Healthy	74	29.5	157	62.5	92.0				
Health Care Habits	Unhealthy	49	19.5	137	54.6	74.1	37.82	0.00	0.388	Avera ge
	Healthy	45	17.9	20	8.0	25.9				

4. Discussion

The study conducted on lifestyle and gastrointestinal disorders in UNACH medical students revealed a statistically significant relationship between these factors, which allowed to reject the null hypothesis and accept the research hypothesis. This finding reinforces the growing evidence on the impact of lifestyle on digestive health, aligning with previous studies such as those of Su et al., who identified a high prevalence of symptoms such as abdominal pain, bloating and irritable bowel syndrome in university students, especially those subjected to high levels of stress and unhealthy habits (14). The relationship between stress and gastrointestinal disorders is a well-documented phenomenon in the medical literature. Underlying pathophysiological mechanisms include activation of the hypothalamic-pituitary-adrenal (HPA) axis, increased cortisol production and disruption of intestinal motility, which may contribute to the onset or exacerbation of functional symptoms. Furthermore, prolonged stress can induce changes in the intestinal microbiota, a factor increasingly recognized in the pathogenesis of diseases such as irritable bowel syndrome (IBS) and functional dyspepsia (7).

On the other hand, some studies have confirmed that poor diet, high caffeine consumption, and disruption of the circadian rhythm due to long academic hours can aggravate digestive symptoms in this population (15). In particular, frequent intake of ultra-processed foods, skipping meals, and excessive consumption of gastric irritants such as coffee and alcohol have been identified as key risk factors for the development of gastritis and gastroesophageal reflux.

Likewise, research such as that of Huerta-Medrano has indicated a high incidence of disorders such as gastritis, heartburn, and regurgitation among medical students, with a strong link to irregular diet and sedentary lifestyle. These findings are consistent with studies on the impact of lifestyle on gastric mucosal barrier dysfunction, where a diet deficient in antioxidants and rich in saturated fats can promote oxidative stress and inflammation of the digestive mucosa (16).

Despite this evidence, it is argued that the etiology of gastrointestinal disorders is multifactorial, suggesting that, although lifestyle plays a crucial role, it should not be considered as the only underlying cause. Genetic factors, individual predisposition, intestinal dysbiosis and pre-existing conditions may also influence the manifestation and severity of these pathologies (17).

5. Conclusions

- The present study demonstrated a statistically significant relationship between various lifestyle choices and the presence of gastrointestinal disorders in medical students. These findings are

consistent with previous research and suggest that certain daily habits, particularly those related to diet and rest, may play a significant role in the digestive health of this population.

- Dietary habits, in particular, showed a significant association with symptoms such as abdominal pain, heartburn, and functional dyspepsia. While these results support the hypothesis that poor nutrition may be linked to a higher prevalence of gastrointestinal symptoms, they do not allow for establishing a direct causal relationship. Promoting a balanced diet, along with reducing the consumption of ultra-processed foods and regulating mealtimes, is proposed as a potentially beneficial strategy within a broader intervention approach.
- Current evidence supports the hypothesis that lifestyle choices are significantly related to the gastrointestinal health of college students. However, to effectively address these pathologies, it is essential to adopt a holistic approach that considers biological, psychological, and environmental factors. Future studies could focus on multidisciplinary interventions that integrate health education, stress management strategies, and the promotion of healthy eating habits to mitigate the prevalence of these disorders in the student population.

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