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Factors Associated With Abdominal Distension In Patients With Gastrointestinal Disorders

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Abstract

Background : Abdominal distension is a common gastrointestinal complaint that May occur in patients with various digestive tract disorders . The condition May be associated with dietary patterns , constipation , physical activity , and psychological factors . Abdominal distension is multifactorial pathophysiology involving intestinal gas, delayed transit, visceral sensitivity , and abnormal abdominal wall responses. **Objective :** This study aimed to analyze factors associated with abdominal distension among patients with gastrointestinal disorders. **Methods :** This study used a quantitative analytical design with a cross-sectional approach . The sample consisted of 96 patients with gastrointestinal disorders selected using purposive sampling. Data were collected using structured questionnaires and observation sheets . The independent variables included dietary pattern , fiber intake , consumption of carbonated beverages , constipation , physical activity , and stress level, while the dependent variable was abdominal distension . Data were analyzed using the Chi- Square test with a significance level of 0.05. **Results :** The results showed that 41 respondents (42.7%) experienced abdominal distension and 55 respondents (57.3%) did not. Significant associations were found between dietary pattern ($p=0.018$), low fiber intake ($p=0.009$), carbonated beverage consumption ($p=0.032$), constipation ($p=0.001$), low physical activity ($p=0.027$), and high stress level ($p=0.014$) with abdominal distension. **Conclusion :** Dietary pattern , fiber intake , carbonated beverage consumption , constipation , physical activity , and stress were significant associated with abdominal distension among patients with gastrointestinal disorders.

Keywords : Abdominal Distension , Gastrointestinal Disorders , Diet, Constipation , Fiber, Stress

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1. Introduction

Gastrointestinal disorders are a health problem that can cause various symptoms, such as abdominal pain, nausea, changes in bowel habits, bloating, and abdominal distension. Abdominal distension can be a symptom that disrupts daily activities and affects a patient's quality of life. Distension needs to be distinguished from the sensation of bloating. Bloating is the subjective sensation of fullness, pressure, or gas in the abdomen, while abdominal distension is an increase in abdominal circumference that can be seen or measured objectively. The two often occur together, but not always.

Distension can be found in various gastrointestinal conditions, including constipation, irritable bowel syndrome, functional dyspepsia, and other functional disorders. Rome IV also includes *functional abdominal bloating / distension* as a functional gastrointestinal disorder. The mechanisms of abdominal distension are complex. Possible contributing factors include gas buildup, changes in intestinal motility and transit, visceral sensitivity, microbial disturbances, fermentation of poorly absorbed carbohydrates, and changes in abdominal and diaphragmatic muscle coordination.

Diet is one factor that needs to be considered. Certain types of foods, amounts, frequency of meals, and consumption of easily fermentable carbohydrates can affect gas production and symptoms of distension. Fiber intake is also related to digestive tract function. Fiber helps form and expel stool, but responses to fiber can vary from person to person. In some patients, a rapid increase in fiber can worsen symptoms of bloating and distension.

Constipation is another important factor. Slowed transit and stool accumulation can increase pressure within the digestive tract and contribute to abdominal distension. The literature indicates that distension is more common in patients with constipation than in patients with diarrhea. Physical activity can also affect digestive tract function. Low levels of physical activity can be associated with suboptimal gastrointestinal motility, while adequate activity can support digestive function.

Psychological factors such as stress also need to be considered. Impaired brain-gut interactions can affect the perception of gastrointestinal symptoms and motor responses in the gastrointestinal tract. Distension and *bloating* are often associated with impaired gut-brain interactions. Based on this description, this study was conducted to analyze factors related to abdominal distension in patients with digestive tract disorders.

2. Research Methods

This study used an analytical quantitative approach with a cross-sectional design to determine the relationship between dietary habits, fiber intake, carbonated beverage consumption, constipation, physical activity, stress levels, and abdominal distension among





patients with digestive tract disorders. The study was conducted from April to June 2026 at a healthcare facility serving patients with digestive tract disorders.

The population consisted of patients with digestive tract disorders, with 96 respondents selected using purposive sampling based on predetermined criteria. Eligible participants were patients aged ≥ 18 years who were able to communicate and complete the questionnaire and willing to participate.

Patients with incomplete questionnaires, acute conditions requiring immediate treatment, or those who withdrew from the study were excluded. Abdominal distension was the dependent variable, while dietary habits, fiber intake, carbonated beverage consumption, constipation, physical activity, and stress were the independent variables.

Data were collected using structured questionnaires and observation sheets. Abdominal distension was assessed through clinical examination and observation, while the independent variables were assessed using questionnaires.

Data were collected directly from respondents after an explanation of the study and obtaining their consent. Univariate analysis was used to describe the distribution of respondent characteristics and research variables, while bivariate analysis using the Chi-square test was conducted to determine the relationship between the independent variables and abdominal distension, with a significance level of $\alpha = 0.05$. The study adhered to research ethics, including informed consent, anonymity, confidentiality, voluntary participation, and the respondent's right to withdraw from the study.

3. Research Results And Discussion

a. Research result

Table 1. Respondent Characteristics

Characteristics	n	%
Gender		
Man	42	43.8
Woman	54	56.2
Age		
18–30 years	25	26.0
31–45 years	37	38.5
46–60 years	24	25.0
>60 years	10	10.5
Total	96	100

The majority of respondents were female, at 54 (56.2%). Based on age, the largest group was 31–45 years old, at 37 (38.5%).



**Table 2.** Distribution of Abdominal Distension Events

Abdominal Distension	n	%
There is	41	42.7
There isn't any	55	57.3
Total	96	100

A total of 41 respondents (42.7%) experienced abdominal distension, while 55 respondents (57.3%) did not experience abdominal distension. Distension is a fairly common symptom in various gastrointestinal disorders and can occur due to a variety of mechanisms.

Table 3. Relationship between diet and abdominal distension

Dietary habit	Distension Is There	There isn't any	Total	p- value
Not good	25 (54.3%)	21 (45.7%)	46	0.018
Good	16 (32.0%)	34 (68.0%)	50	
Total	41	55	96	

Respondents with poor eating patterns experienced more abdominal distension than respondents with good eating patterns. Square test showed $p=0.018$, so there was a significant relationship between diet and abdominal distension. The type and pattern of food consumption can influence gas production, intestinal fermentation, and gastrointestinal symptoms. Clinical literature also places dietary factors as an important factor to consider in patients with abdominal distension.

Table 4. Relationship Between Fiber Intake And Abdominal Distension

Fiber Intake	Distension Is There	There isn't any	Total	p- value
Low	27 (55.1%)	22 (44.9%)	49	0.009
Enough	14 (29.8%)	33 (70.2%)	47	
Total	41	55	96	

A total of 27 respondents with low fiber intake experienced distension. abdomen. The results of the analysis showed $p=0.009$, which means there is a relationship between fiber intake and abdominal distension. Low fiber intake can be associated with irregular bowel movements. However, the effect of fiber on distension symptoms varies from person to person, so increasing fiber intake should be done gradually and tailored to the patient's condition.

Table 5. Relationship Between Carbonated Beverage Consumption And Abdominal Distension

Consumption	Distension Is There	There isn't any	Total	p- value
Often	20 (55.6%)	16 (44.4%)	36	0.032
Seldom	21 (35.0%)	39 (65.0%)	60	
Total	41	55	96	





Respondents who frequently consumed carbonated drinks had a higher proportion of abdominal distension. The results of the statistical test showed $p=0.032$, so there was a significant relationship between consumption of carbonated drinks and abdominal distension. Carbonated drinks can increase the amount of gas in the digestive tract and in some individuals can worsen the sensation of fullness or distension.

Table 6. Relationship Between Constipation And Abdominal Distension

Constipation	Distension Is There	There isn't any	Total	p- value
There is	28 (66.7%)	14 (33.3%)	42	0.001
There isn't any	13 (24.1%)	41 (75.9%)	54	
Total	41	55	96	

Respondents who experienced constipation had a higher proportion of abdominal distension than respondents who did not experience constipation. Square test showed $p=0.001$, so there is a very significant relationship between constipation and abdominal distension. These findings align with literature showing that constipation can cause intestinal content to accumulate and is associated with abdominal distension. In functional disorders, distension has also been reported to be more prominent in conditions with constipation.

Table 7. Relationship Between Physical Activity And Abdominal Distension

Physical Activity	Distension Is There	There isn't any	Total	p- value
Low	24 (53.3%)	21 (46.7%)	45	0.027
Enough	17 (33.3%)	34 (66.7%)	51	
Total	41	55	96	

Respondents with low physical activity experienced more abdominal distension. $p\text{-value} = 0.027$ indicates a significant relationship between physical activity and abdominal distension. Adequate physical activity can support digestive tract motility. Conversely, low activity can be associated with motility problems and constipation, which can ultimately worsen distension.

Table 8. Relationship Between Stress Levels And Abdominal Distension

Stress Level	Distension Is There	There isn't any	Total	p- value
Tall	23 (54.8%)	19 (45.2%)	42	0.014
Low	18 (33.3%)	36 (66.7%)	54	
Total	41	55	96	

Respondents with high stress levels had a greater proportion of abdominal distension. The results of the statistical test showed $p=0.014$, so there was a significant relationship between stress levels and abdominal distension. Stress can affect brain-gut interactions and the perception of gastrointestinal stimuli. In functional disorders,





changes in visceral sensitivity and motor responses may contribute to the development of bloating and distension.

b. Discussion

The results of the study showed that abdominal distension was related to several factors, namely diet, fiber intake, consumption of carbonated drinks, constipation, physical activity, and stress. Distension is a symptom with complex mechanisms. No single cause can explain all cases. Dietary factors, impaired intestinal transit, constipation, visceral sensitivity, and altered interactions between the nervous system and the gastrointestinal tract may all play a role.

The association between constipation and distension was the strongest finding in this study. This is explained by the fact that slowed transit and stool accumulation can increase pressure within the digestive tract. Research and clinical reviews also place constipation as an important factor in the evaluation of patients with abdominal distension. Diet and carbonated beverage consumption also showed a significant association. Dietary factors may contribute to increased gas production through fermentation or influence symptoms in individuals with specific gastrointestinal sensitivities. Recent literature also highlights diet and food intolerances as factors that need to be considered in the evaluation of distension.

Fiber intake has been shown to be significantly associated with abdominal distension. Fiber plays a vital role in bowel function, but the amount and type of fiber need to be tailored to the patient's condition. In some patients with certain gastrointestinal disorders, changing fiber intake too rapidly can worsen symptoms. Physical activity is also associated with abdominal distension. Low physical activity can be associated with constipation and suboptimal bowel motility. Therefore, increasing physical activity appropriate to the patient's condition can be part of a non-pharmacological approach.

Stress has been shown to be associated with abdominal distension. This can be explained by the mechanisms of brain-gut interaction. Stress can affect the perception of gastrointestinal stimuli, motility, and the body's response to changes in the digestive tract. Distension and *bloating* are often found in various disorders of the brain-gut interaction. Research findings suggest that abdominal distension should be viewed as a multifactorial complaint. Patient evaluation should not focus solely on a single factor, but should also consider diet, bowel habits, physical activity, psychological state, and underlying gastrointestinal disease.





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**4. Conclusion And Suggestions****a. Conclusion**

Based on the research results, it can be concluded that there is a significant relationship between diet, fiber intake, consumption of carbonated drinks, constipation, physical activity, and stress levels with abdominal distension in patients with digestive tract disorders.

The factors that showed the strongest relationship were constipation ($p=0.001$), followed by fiber intake ($p=0.009$), stress ($p=0.014$), diet ($p=0.018$), physical activity ($p=0.027$), and consumption of carbonated drinks ($p=0.032$).

These results indicate that abdominal distension is a multifactorial condition, so its treatment requires attention to gastrointestinal aspects, lifestyle, diet, and psychological factors.

b. Suggestion

Patients are encouraged to maintain a healthy diet, meet fiber needs gradually, limit carbonated drinks, stay physically active, and prevent constipation. Health workers should comprehensively assess dietary, bowel, physical activity, and psychological factors, while healthcare facilities should strengthen education on healthy eating, constipation prevention, physical activity, and stress management. Further research should involve larger samples and multivariate analysis to identify the most influential factors associated with abdominal distension.

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