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Assessing the Correlation between Spicy Food Consumption and Dyspepsia Symptoms in Medical and Health Students at Atma Jaya Catholic University of Indonesia

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Abstract

Introduction: The capsaicin (8-methyl-N-vanillyl-6-nonenamide) content in spicy foods can trigger irritation and increase gastric acid production, which potentially damages the stomach mucous layer by increasing chloric acid levels (HCl). It is known that dyspepsia has a variety of causes and one of them can be triggered by the consumption of irritating foods, such as spicy foods. Therefore, the research was conducted to determine whether there was a significant relationship between the consumption of spicy foods and the incidence of dyspepsia in students of the Faculty of Medicine and Health Sciences at the Atma Jaya Catholic University of Indonesia.

Methods: This research method is an analytical observational study using cross-sectional methods. The main variables in this study were dyspepsia, measured using the Rome III questionnaire, and the frequency of spicy food consumption measured using the Food Frequency Questionnaire (FFQ). The sample consisted of 107 people randomly selected. The data was analyzed statistically using the Fischer Exact test.

Results: This study showed that 56.1% of respondents frequently eat spicy foods, while the majority, as much as 95.3%, also have dyspepsia. There was a significant correlation between spicy eating habits and dyspepsia, with a p-value of 0.014 ($p<0.05$).

Conclusion: The results showed a statistically significant relationship between spicy eating habits and dyspepsia, so it is recommended for students to reduce spicy food consumption as it can affect the onset of dyspepsia.

Keywords: dyspepsia - spicy foods - stomach - Rome III questionnaire - food frequency questionnaire

INTRODUCTION

Dyspepsia, derived from the Greek word meaning "difficulty digestion", refers to a group of heterogeneous symptoms in the upper abdomen. In medical terminology, such symptoms include discomfort or pain in the upper abdomen after eating, swelling, rapid feeling of fullness, burning sensations in the epigastrium, dizziness, nausea, and vomiting. All over the world, the prevalence of dyspepsia is quite high. According to studies conducted in Western countries, the prevalence of dyspepsia ranges from 7% to 41% in 2009. However, only an estimated 10-20% of patients seek medical attention for their symptoms. Furthermore, data suggests a potential increase in dyspepsia incidence, with healthcare visits for this condition rising by 5-7% annually.[1]

Functional abdominal pain disorders (FAPD) encompass a range of conditions characterized by chronic abdominal pain without identifiable organic pathology. These disorders include functional abdominal pain (FAP), irritable bowel syndrome (IBS), functional dyspepsia (FD), and abdominal migraine (AM). The etiology of FAPD likely varies based on region and age group. A previous study in Southeast Asia reported a prevalence of 10.2%, while our investigation among Indonesian adolescents identified a slightly higher prevalence of 11.5%. Interestingly, females demonstrated a significantly higher prevalence of FAPD compared to males. Additionally, gastrointestinal symptoms such as bloating, loss of appetite, belching, and flatulence were found to be strongly associated with FAPD in this population.[2]

Spicy food consumption is recognized as a trigger for dyspepsia. The stomach lining may be harmed by spicy meals since they might enhance the production of stomach acid. This may make symptoms of dyspepsia worse and raise the possibility of stomach problems. Consequently, limiting the amount of spicy food consumed is crucial for people prone to dyspepsia to manage this illness.[3]

A study conducted in rural South China investigated the link between eating habits and FD in a group of 203 participants. The research found that consuming spicy foods was associated with an increased risk of FD, contributing to nearly 28.57% of the cases observed. The study participants with FD were typically around 38 years old, and the most frequent symptom reported was upper abdominal pain, affecting over 60% of them.[3] Similar study conducted at an Indonesian hospital yielded consistent findings. The study reported a high prevalence of dyspepsia syndrome (59.4%) among patients with a history of regular spicy food consumption.[4]

Adolescents with dyspepsia may have major reductions in quality of life. Decreased daily productivity can disrupt the learning process

and ultimately lower academic achievement. As a result, students may become less valuable members of society and the country's future generation. Furthermore, the inability to eat in normal portions because of pain can lead to future nutritional problems, like iron deficiency anemia, which has serious implications for adolescent health in the future.[5]

Our research aims to explore the association between spicy food consumption and dyspepsia within a specific population: the medical students at Atma Jaya Catholic University's Faculty of Medicine and Health Sciences. This group is particularly interesting due to the potential for high-stress levels and possibly unhealthy dietary habits among medical students. Our methodology utilizes questionnaires or dietary assessments to isolate the specific impact of spicy food consumption on dyspepsia prevalence within this student population. This approach acknowledges and considers the potential influence of other contributing factors.

METHODS

Because both the independent and dependent variables were measured at the same time to examine the relationship between them, this study used a cross-sectional study design. One hundred seven respondents participated in the study. The study was held from May to December 2023. The population under investigation comprised students enrolled between 2020 and 2022 at the Faculty of Medicine and Health Sciences, Atma Jaya Catholic University, and samples were chosen using random sampling techniques.

Students who were willing to participate and who had a history of eating spicy foods from 2020 to 2022 met the inclusion criterion. Students who had previously received therapy or care for an *H. pylori* infection, frequently consumed acidic foods or drinks, habitually skipped meals, drank alcohol, regularly used NSAIDs (such as COX-1 inhibitors or nonselective COX inhibitors), and smoked were excluded from consideration.

There are two questionnaires used in this study. The Food Frequency Questionnaire (FFQ) is used to quantify the consumption of spicy foods, and a questionnaire based on Rome III criteria is used to assess dyspepsia. Every respondent's daily values are gathered to identify the frequency categories of spicy food consumption. After obtaining daily frequency values, they are summed up for each variable and arranged sequentially. If the total daily value of a participant is equal to or greater than the median value, then frequent consumption frequency is assigned. A participant is classified as having frequent consumption frequency if their total daily value is equal to or higher than the median value.

Conversely, if the total daily value of a participant is less than the median value, then

rare consumption frequency is assigned. The median score of FFQ for the spicy foods variable is 2.51. The dyspepsia questionnaire is based on Rome III criteria and consists of six questions with "yes" or "no" answers. Dyspepsia assessment is considered positive if there is a "yes" answer to one or more questions numbered 1 - 4, or if there are two or more "yes" answers to all questions. Conversely, dyspepsia assessment is considered negative if all questions are answered with "no".

Univariate analysis, which tries to give a summary of the frequency distribution of the independent and dependent variables in the study, is the first step in the data analysis process. The association between the dependent variable (presence of dyspepsia) and the independent variable (consumption of spicy food) is then verified by bivariate analysis. The statistical analysis employs the Fischer Exact test, where the independent variable is spicy food consumption and the dependent variable is the occurrence of dyspepsia. When performing statistical computations, a 95% confidence level or confidence interval (CI) (α=0.05) is used. There is a significant link between the independent and dependent variables if the p-value is less than 0.05.

RESULTS

The demographic distribution of the respondents in this study involves their academic year, age, and gender. Based on the academic year, there is variation in the number of respondents, with 44 respondents (41.1%) from the 2020 class, 25 respondents (23.4%) from the 2021 class, and 38 respondents (35.5%) from the 2022 class. The distribution also includes gender, with 33 respondents (30.8%) being male and 74 respondents (69.2%) female. Meanwhile, the distribution of respondent data based on age shows significant variation. Respondent's ages range from 18 to 23 years, with a significant number of respondents falling within specific age ranges. There are 11 respondents (10.3%) aged 18, 25 respondents (23.4%) aged 19, 29 respondents (27.1%) aged 20, and 40 respondents (37.4%) aged 21. Additionally, there is one respondent (0.9%) at age 22 and one respondent (0.9%) at age 23.

The study's respondent's age, gender, and academic year are distributed demographically. The number of respondents varies according to academic year: 44 (41.1%) from the 2020 class, 25 (23.4%) from the 2021 class, and 38 (35.5%) from the 2022 class are the respondents. Gender is another factor in the distribution: 74 respondents (69.2%) are female and 33 respondents (30.8%) are male. Meanwhile, the distribution of respondent data based on age

shows significant variation. Respondent's ages range from 18 to 23 years, with a significant number of respondents falling within specific age ranges. There are 11 respondents (10.3%) aged 18, 25 respondents (23.4%) aged 19, 29 respondents (27.1%) aged 20, and 40 respondents (37.4%) aged 21. Additionally, there is one respondent (0.9%) at age 22 and one respondent (0.9%) at age 23.

Table 1. Distribution of Respondent Characteristics

Variables	Frequency (n)	Percentage (%)
Class		
2020	44	41,1
2021	25	23,4
2022	38	35,5
Gender		
Male	33	30,8
Female	74	69,2
Age		
18 years old	11	10,3
19 years old	25	23,4
20 years old	29	27,1
21 years old	40	37,4
22 years old	1	0,9
23 years old	1	0,9
Frequency of spicy food consumption		
Rare	47	43,9
Frequent	60	56,1
Dyspepsia		
Negative	5	4,7
Positive	102	95,3

Following the collection of respondent's data, differences in the way they consumed spicy foods were noted in their eating habits. Sixty respondents (56.1%) reported eating spicy foods regularly, whereas 47 respondents (43.9%) reported eating spicy foods occasionally. Additionally, the examination of the data revealed that the majority of respondents had dyspepsia, with 102 respondents (95.3%) indicating a positive assessment of this condition and only 5 respondents (4.7%) indicating a negative assessment.

Based on the study's results, 5 respondents (2.7%) who don't often eat spicy foods were found to have dyspepsia, whereas 42 respondents (41.2%) from the group that doesn't often eat spicy foods were found to have dyspepsia. In contrast, 58.8% of the 60 respondents who reported regularly consuming spicy foods were found to have dyspepsia. Based on the results of the Fischer Exact test analysis, there is a significant influence of consuming spicy foods on dyspepsia among students of the Faculty of Medicine and Health Sciences at Atma Jaya Catholic University of Indonesia, with a p-value of 0.014

Table 2. Distribution of Respondents: The Influence of Consuming Spicy Food on Dyspepsia among Students of the Faculty of Medicine and Health Sciences, Atma Jaya Catholic University of Indonesia

		Dyspepsia						
		Negative		Positive		Total		p
		n	%	n	%	n	%	Value
The habit of consuming spicy foods	Rare	5	100	42	41,2	47	43.9	0,014
	Frequent	0	0	60	58,8	60	56,1	
	Total	**5**	**100**	**102**	**100**	**107**	**100**	

DISCUSSION

The purpose of this study is to determine whether eating spicy foods regularly has a substantial impact on the incidence of functional dyspepsia in students at Atma Jaya Catholic University of Indonesia's Faculty of Medicine and Health Sciences. According to the results of the bivariate analysis based on Table 1.1, dyspepsia was reported by 60 respondents who regularly consumed spicy food and 42 respondents who rarely consumed spicy food. Using the Fischer Exact test, which has a p-value of 0.014 ($\alpha \leq 0.05$), the results show a significant correlation between the habit of eating spicy foods and the incidence of functional dyspepsia.

These findings are consistent with previous research indicating that consuming spicy foods significantly increases the likelihood of dyspepsia syndrome among biology education students at Jember University.[7] These results are consistent with prior research demonstrating a connection between consuming spicy foods and the prevalence of functional dyspepsia syndrome observed in the internal medicine clinic of Haji Medan General Hospital. People who eat spicy food frequently are also more prone to get dyspepsia. These results provide further support for the observed relationship between spicy food consumption and dyspepsia in the medical student population.[4]

Dyspepsia can be caused by many bad lifestyle choices, such as eating an excessive amount of spicy or acidic foods or drinking alcohol or caffeine, smoking, stress, having an *H. pylori* infection, or taking NSAIDs. When consumed excessively, spicy foods, alcohol, and coffee are considered irritants that can increase stomach acid production. Foods high in capsaicin, especially those that are spicy, can raise the levels of hydrochloric acid (HCl), which can erode the mucosa lining the stomach. As a result, eating these meals frequently increases the chance of acquiring dyspepsia syndrome.[6]

Excessive consumption of spicy foods, especially more than once a week for a minimum of six months, can lead to irritation of the gastric mucosa. This happens as a result of the direct gastrointestinal lining damage caused by the qualities of spicy foods like pepper, chili, and spices. The extremely acidic environment of the stomach, which typically serves as a barrier against infections, can worsen irritation of the gastric lining when damage to the gastric barrier occurs. Furthermore, it is well-recognized that spicy foods overstimulate the production of stomach acid, a condition known as dyspepsia syndrome that is frequently accompanied by symptoms related to the digestive system, including discomfort in the abdomen.[4] In this regard, it is important to pay attention to the pattern of spicy food consumption to avoid negative impacts on gastric health and overall digestion.

CONCLUSION

The majority of respondents have a habit of consuming spicy foods frequently, reaching 56.1%. Meanwhile, about 43.9% of other respondents have a habit of consuming spicy foods infrequently. Additionally, the majority of respondents also experience dyspepsia with a positive assessment of 95.3%, while only about 4.7% of respondents receive a negative assessment regarding dyspepsia. Another interesting point is that all respondents who infrequently consume spicy foods experience dyspepsia with a negative assessment, while the majority of respondents (56.1%) who frequently consume spicy foods have a positive assessment related to dyspepsia. From the analysis results, it can be concluded that there is a significant relationship between consuming spicy food and the occurrence of dyspepsia among students of the Faculty of Medicine and Health Sciences at Atma Jaya Catholic University of Indonesia.

The findings of the analysis, discussion, and conclusion lead the researchers to recommend that more studies be done with a wider range of age groups and in diverse settings. More representative and diversified results are anticipated as a result. In addition, additional research is required to take into account other variables that have not been examined by earlier researchers but may be related to the development of dyspepsia. Thus, we can gain a deeper and more thorough understanding of the connection between eating spicy food and dyspepsia.

CONFLICT OF INTEREST

The author declares that there was no conflict of interest.

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