

Factors Associated with the Incidence of Dyspepsia in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

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ABSTRACT/ ABSTRAK

ABSTRACT. *Dyspepsia is a common digestive disorder and is classified as a non-communicable disease with a high prevalence in Indonesia, including in the working area of Teluk Tiram Public Health Center, Banjarmasin City. Several factors such as age, gender, dietary patterns, and stress are suspected to contribute to the incidence of dyspepsia. This study aims to identify the factors associated with the incidence of dyspepsia in the specified area. A quantitative method with a cross-sectional design was employed. The sample consisted of 106 respondents selected through purposive sampling based on inclusion and exclusion criteria. Data were collected using a questionnaire and analyzed using Spearman's rank correlation test. The results showed significant associations between age ($p=0.000$), gender ($p=0.034$), dietary patterns ($p=0.000$), and stress ($p=0.000$) and the incidence of dyspepsia. The strength of the relationships based on Spearman correlation values was as follows: gender ($r=0.206$, weak), age ($r=-0.462$, moderate), dietary patterns ($r=-0.949$, strong), and stress ($r=0.554$, moderate). It can be concluded that these factors significantly contribute to the incidence of dyspepsia, with dietary patterns emerging as the most dominant factor. Targeted educational interventions focusing on dietary and stress management should be strengthened, particularly among vulnerable groups such as the elderly and women.*

ABSTRAK. Dispepsia merupakan gangguan pencernaan yang sering terjadi dan termasuk penyakit tidak menular dengan prevalensi tinggi di Indonesia, termasuk di wilayah kerja Puskesmas Teluk Tiram Kota Banjarmasin. Beberapa faktor seperti usia, jenis kelamin, pola makan, dan stres diduga berperan dalam kejadian dispepsia. Penelitian ini bertujuan untuk mengetahui faktor-faktor yang berhubungan dengan kejadian dispepsia di wilayah tersebut. Penelitian menggunakan metode kuantitatif dengan desain cross-sectional. Jumlah sampel sebanyak 106 responden yang dipilih melalui teknik purposive sampling berdasarkan kriteria inklusi dan eksklusi. Pengumpulan data dilakukan menggunakan kuesioner, kemudian dianalisis dengan uji *Spearman Rank*. Hasil penelitian menunjukkan adanya hubungan signifikan antara usia ($p=0,000$), jenis kelamin ($p=0,034$), pola makan ($p=0,000$), dan stres ($p=0,000$) dengan kejadian dispepsia. Kekuatan hubungan berdasarkan nilai korelasi Spearman adalah jenis kelamin ($r=0,206$, rendah), usia ($r=-0,462$, sedang), pola makan ($r=-0,949$, kuat), dan stres ($r=0,554$, sedang). Dapat disimpulkan bahwa faktor-faktor tersebut memiliki kontribusi bermakna terhadap kejadian dispepsia, dengan pola makan sebagai faktor dominan. Intervensi edukatif yang terfokus pada pengelolaan pola makan dan stres perlu ditingkatkan, terutama pada kelompok rentan seperti lansia dan perempuan.

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INTRODUCTION

Indonesia is currently facing two major challenges in the health sector: the control of communicable diseases and non-communicable diseases. Over the past five years, there has been a significant increase in cases of non-communicable diseases nationwide, one of which is gastrointestinal disorders such as dyspepsia (Nurhaidah et al., 2021). Despite ongoing efforts to improve public health, numerous obstacles remain in the development of health programs. One major challenge in raising the overall health status is the high morbidity and mortality rates in Indonesia due to non-communicable diseases (Diani, 2023).

Dietary patterns are one of the contributing factors to the onset of dyspepsia. Habits such as irregular eating schedules, eating in a hurry, and inconsistent meal times can trigger this disorder. Dietary patterns refer to the combination of types and portions of food consumed by individuals or groups over a specific period. The habit of consuming spicy or acidic foods and beverages increases the likelihood of dyspeptic symptoms. High gastric acidity normally serves to kill pathogenic microorganisms ingested with food. However, when the protective lining of the stomach is damaged, excessive acidity can worsen irritation of the gastric wall (Aprilia et al., 2024).

Patients aged ≥ 40 years are more frequently affected by dyspepsia, accounting for 173 cases (80.8%), compared to 115 individuals (70.1%) in the same age group who did not experience dyspepsia. Conversely, among those under 40 years old, the majority did not experience dyspepsia (49 individuals or 29.9%), while only 41 individuals (19.2%) did. The risk of dyspepsia is known to increase with age. This is attributed to physiological changes, such as the thinning of the gastric mucosal layer, making the stomach more vulnerable to *Helicobacter pylori* infection or autoimmune disorders. In contrast, dyspepsia among younger individuals is generally linked to unhealthy lifestyle habits. Consequently, the prevalence of dyspepsia tends to be higher in older age groups (Wibawani, Faturahman, & Purwanto, 2021).

Mental and emotional factors such as stress and depression can affect the digestive system by altering gastric acid production. These changes can influence blood flow and vascular integrity in the gastric lining and increase pain sensitivity. Higher levels of stress are associated with a greater risk of dyspepsia. Stress experienced by individuals may trigger anxiety related to lifestyle. Fatigue, mental health disturbances, heavy workloads, and financial difficulties may lead to heightened anxiety, which in turn can manifest in various physical symptoms, including digestive problems (Octaviana, Noorhidayah, & Rachman, 2021).

Gender plays a role in influencing the incidence of dyspepsia. The majority of dyspepsia sufferers are female, totaling 154 individuals (72.0%), compared to 60 males (28.0%). Women tend to have a higher risk of experiencing dyspepsia. This may be due to concerns about weight gain, which prompt them to adopt strict diets and irregular eating patterns. In addition, women are generally more emotionally sensitive than men, making them more susceptible to prolonged stress, which can trigger increased gastric acid production. Moreover, gender also affects the function of the hormone gastrin, which tends to be more responsive in women than in men (Wibawani, Faturahman, and Purwanto 2021).

Dyspepsia is a condition characterized by pain or discomfort centered in the upper abdominal area. These symptoms may be related to organic disorders of the upper gastrointestinal tract, such as gastroesophageal reflux disease (GERD), gastritis, peptic ulcers,

cholecystitis, or other diagnosed abnormalities. The etiological factors of dyspepsia include dietary patterns and environmental influences, gastric acid secretion, gastric motility, visceral sensitivity, psychological factors, and *Helicobacter pylori* infection. Dyspepsia may also be triggered by high levels of stress, consumption of irritant foods and beverages, and a history of gastrointestinal disorders such as gastritis or peptic ulcers. The regular intake of spicy foods, acidic foods, tea, coffee, and carbonated beverages also increases the risk of dyspeptic symptoms (Octaviana, Noorhidayah, and Rachman 2021).

The World Health Organization (WHO) projected that by 2020, non-communicable diseases would account for 73% of all deaths globally, with morbidity rates expected to increase to 60%. Dyspepsia is among the most prevalent non-communicable diseases worldwide (Timah S, 2021). According to SEARO (South East Asian Regional Office), the death rate due to non-communicable diseases was expected to reach 50%, while morbidity was projected to rise to 42%. Dyspepsia is a non-communicable disease commonly found not only in Indonesia but globally, affecting approximately 13–40% of the world's population each year (Octaviana, Noorhidayah, and Rachman 2021).

According to Indonesia's Health Profile (Kemenkes RI, 2021), dyspepsia was one of the top five causes of hospital admission that year, with 18,807 cases (39.8%) occurring in males and 60.2% in females. In 2022, around 10 million people—or 6.5% of the population—were affected by dyspepsia. This number was projected to rise to 28 million in 2023, accounting for 11.3% of Indonesia's total population (Widya et al. 2023).

Banjarmasin City, located in South Kalimantan Province, is one of the regions in Indonesia with a notably high number of dyspepsia cases. Dyspepsia has consistently ranked among the top 10 most common diseases in the city from 2020 to 2023. In 2020, it ranked third with 18,213 cases. In 2021, it remained in third place with 15,314 cases. In 2022, it maintained the same rank with a rise to 22,725 cases. In 2023, although it dropped to fourth place, the number of cases increased to 23,120 (Dinas Kesehatan Kota Banjarmasin 2024).

Based on a preliminary study conducted at the Teluk Tiram Public Health Center's outpatient department on November 26, 2024, interviews were held with 10 respondents, 7 of whom reported experiencing symptoms of dyspepsia. Most of the respondents were female and aged over 40 years. Teluk Tiram Public Health Center, located in Banjarmasin City, is one of the health centers with the highest number of dyspepsia cases in the entire city. The number of cases recorded was 907 in 2021, 1,730 in 2022, 2,223 in 2023, and 1,762 cases between January and October 2024 (Puskesmas Teluk Tiram, 2024).

Although the incidence of dyspepsia in the working area of Teluk Tiram Public Health Center has remained high and consistently ranked among the most reported diseases over the past several years, to date there has been no study specifically identifying the contributing factors to this high incidence. The lack of detailed local data on the influence of age, gender, dietary patterns, and stress on the incidence of dyspepsia underscores the importance of this study. Therefore, this research aims to analyze the factors associated with the incidence of dyspepsia in the working area of Teluk Tiram Public Health Center, Banjarmasin City.

RESEARCH METHOD

This study employed a cross-sectional design due to its advantages, such as time efficiency, rapid acquisition of respondent data, and the ability to collect multiple variables simultaneously (Amelia 2022). The study aimed to assess the correlation between age, gender, dietary patterns, and stress with the incidence of dyspepsia. The independent variables in this research included age, gender, dietary patterns, and stress levels, while the dependent variable was the incidence of dyspepsia. The population in this study comprised all patients diagnosed with dyspepsia in December, totaling 144 individuals, within the working area of Teluk Tiram Public Health Center, Banjarmasin City. The sample consisted of 106 respondents who experienced dyspepsia during the same period and location. The sample size was determined using Slovin's formula and selected through purposive sampling based on predetermined criteria. The research instrument used was a paper-based questionnaire, which included several questions related to the study objectives.

The collected data were analyzed quantitatively. Univariate analysis was used to describe the characteristics of the respondents, while bivariate analysis using Spearman's rank correlation test was applied to identify the relationship between the independent variables and the incidence of dyspepsia. All data analysis procedures were carried out using IBM SPSS software version 25.

RESULTS

Univariate Analysis

Gender of Respondents

Table 1. Gender of Respondents

No	Gender	Frequency (f)	Percentage (%)
1	Male	28	26.4
2	Female	78	73.6
	Total	106	100

Based on Table 1, the majority of respondents in this study were female, totaling 78 individuals (73.6%). In contrast, male respondents accounted for only 28 individuals (26.4%). This indicates that women were more dominant in this study and tended to experience or report dyspepsia symptoms more frequently.

Age of Respondents

Table 2. Age of Respondents

No	Age Group	Frequency (f)	Percentage (%)
1	Late Adolescence (17–25 years)	13	12.3
2	Early Adulthood (26–35 years)	17	16.0
3	Late Adulthood (36–45 years)	19	17.9
4	Early Elderly (46–55 years)	34	32.1
5	Late Elderly (56–65 years)	23	21.7
	Total	106	100

As shown in Table 2, the most common age group among respondents was early elderly (46–55 years), with 34 individuals (32.1%). Meanwhile, the least represented group was late adolescence (17–25 years), with 13 individuals (12.3%). These findings suggest that dyspepsia is more prevalent among older age groups.

Dyspepsia Incidence

Table 3. Dyspepsia Among Respondents

No	Dyspepsia Severity	Frequency (f)	Percentage (%)
1	Mild Dyspepsia	26	24.5
2	Severe Dyspepsia	80	75.5
	Total	106	100

According to Table 3, the majority of respondents experienced severe dyspepsia, totaling 80 individuals (75.5%). Meanwhile, 26 respondents (24.5%) experienced mild dyspepsia. This finding indicates that the severity level of dyspeptic symptoms among respondents was generally high.

Dietary Patterns

Table 4. Respondents' Dietary Patterns

No	Dietary Pattern	Frequency (f)	Percentage (%)
1	Poor Dietary Pattern	82	77.4
2	Good Dietary Pattern	24	22.6
	Total	106	100

As presented in Table 4, most respondents in the working area of Teluk Tiram Public Health Center had poor dietary patterns, totaling 82 individuals (77.4%). Only 24 respondents (22.6%) were found to have good dietary patterns.

Stress Levels

Table 5. Stress Levels of Respondents

No	Stress Level	Frequency (f)	Percentage (%)
1	Mild Stress	53	50.0
2	Moderate Stress	46	43.4
3	Severe Stress	7	6.6
	Total	106	100

Based on Table 5, most respondents in the working area of Teluk Tiram Public Health Center experienced mild stress, with 53 individuals (50.0%). Meanwhile, 7 respondents (6.6%) were identified as experiencing severe stress

Bivariate Analysis

Relationship Between Gender and Incidence of Dyspepsia

Table 6. Relationship Between Gender and Incidence of Dyspepsia

Gender	Dyspepsia				$\sum j$	%
	Mild Dyspepsia		Severe Dyspepsia			
	F	%	F	%		
Male	11	10.4	17	16.0	28	26.4
Female	15	14.2	63	59.4	78	73.6
Total	26	24.6	80	75.4	106	100
p-value (Sig.) = 0.035						
Spearman Correlation = 0.206						

Based on the results of the Spearman's rank correlation test in Table 6, the p-value is 0.035, which is less than 0.05. This indicates a statistically significant relationship between gender and the incidence of dyspepsia. The Spearman correlation coefficient of 0.206

indicates a weak positive correlation between the two variables, meaning that an increase in one variable tends to be followed by an increase in the other.

Relationship Between Age and Incidence of Dyspepsia

Table 7. Relationship Between Age and Incidence of Dyspepsia

Age Group	Dyspepsia				$\sum j$	%
	Mild Dyspepsia		Severe Dyspepsia			
	F	%	F	%		
Late Adolescence (17–25 years)	0	0.0	13	12.3	13	12.3
Early Adulthood (26–35 years)	0	0.0	17	16.0	17	16.0
Late Adulthood (36–45 years)	2	1.9	17	16.0	19	17.9
Early Elderly (46–55 years)	12	11.3	22	20.8	34	32.1
Late Elderly (56–65 years)	12	11.3	11	10.4	23	21.7
Total	26	24.5	80	75.5	106	100
p-value (Sig.) = 0.000						
Spearman Correlation = −0.462						

Based on the Spearman's rank correlation test shown in Table 7, the p-value is 0.000, which is less than 0.05. This indicates a significant relationship between age and the incidence of dyspepsia. The Spearman correlation coefficient of -0.462 signifies a moderate negative correlation, suggesting that as age increases, the likelihood of severe dyspepsia tends to decrease, or vice versa.

Relationship Between Dietary Patterns and Incidence of Dyspepsia

Table 8. Relationship Between Dietary Patterns and Incidence of Dyspepsia

Dietary Pattern	Dyspepsia				$\sum j$	%
	Mild Dyspepsia		Severe Dyspepsia			
	F	%	F	%		
Poor	2	1.9	80	75.5	82	77.4
Good	24	22.6	0	0.0	24	22.6
Total	26	24.5	80	75.5	106	100
p-value (Sig.) = 0.000						
Spearman Correlation = -0.949						

According to Table 8, the p-value is 0.000, indicating a significant relationship between dietary patterns and the incidence of dyspepsia. The Spearman correlation coefficient of -0.949 denotes a very strong negative correlation, implying that poorer dietary patterns are strongly associated with more severe dyspepsia.

Relationship Between Stress and Incidence of Dyspepsia

Table 9. Relationship Between Stress Levels and Incidence of Dyspepsia

Stress Level	Dyspepsia				$\sum j$	%
	Mild Dyspepsia		Severe Dyspepsia			
	F	%	F	%		
Mild	26	24.5	27	25.5	53	50.0
Moderate	0	0.0	46	43.4	46	43.4
Severe	0	0.0	7	6.6	7	6.6
Total	26	24.5	80	75.5	106	100
p-value (Sig.) = 0.000						
Spearman Correlation = 0.554						

As shown in Table 9, the p-value of 0.000 indicates a statistically significant relationship between stress levels and the incidence of dyspepsia. The Spearman correlation coefficient of 0.554 indicates a moderate positive correlation, meaning higher stress levels tend to be associated with more severe dyspeptic symptoms.

DISCUSSION

Gender Distribution in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

Based on the results presented in Table 1, most respondents in the working area of Teluk Tiram Public Health Center, Banjarmasin City, were female, with 78 individuals (73.6%), while male respondents accounted for 28 individuals (26.4%). This indicates that female participation in this study was higher than that of males.

Gender plays a significant role in the incidence of dyspepsia due to behavioral, lifestyle, and biological differences between men and women, which may influence the risk of developing this condition. Lifestyle differences such as dietary patterns, stress levels, smoking habits, alcohol consumption, and physical activity often vary by gender and can contribute to the incidence of dyspepsia. Hormonal factors may also play a role, especially in women. For example, hormonal changes during the menstrual cycle, pregnancy, or menopause can affect gastric motility and increase sensitivity to dyspeptic symptoms. Conversely, men may have habits such as smoking or consuming fatty and spicy foods that can trigger dyspepsia (Amelia 2022).

Age Distribution in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

Referring to Table 2, the majority of respondents were in the early elderly group (46–55 years), totaling 34 individuals (32.1%). Meanwhile, respondents in the late adolescence category (17–25 years) were the fewest, with 13 individuals (12.3%). Other groups included early adulthood (26–35 years) with 17 respondents (16.0%) and late elderly (56–65 years) with 23 respondents (21.7%). This shows that the early elderly group was the largest in the study.

Age is a critical factor that influences the likelihood of dyspepsia. Older adults have a greater risk of developing dyspepsia due to physiological changes with aging, such as a decline in digestive function or increased gastric sensitivity to acid. However, young individuals may also be susceptible, particularly when they adopt unhealthy dietary patterns (Amelia 2022).

Distribution of Dyspepsia Among Respondents

According to Table 3, most respondents experienced severe dyspepsia, with 80 individuals (75.5%), while 26 individuals (24.5%) had mild dyspepsia. These findings indicate that severe dyspepsia is dominant in this population.

Respondents with mild dyspepsia reported symptoms such as mild upper abdominal discomfort or nausea that disrupted daily activities but were still tolerable. In contrast, those with severe dyspepsia experienced multiple and more intense symptoms including upper abdominal discomfort, postprandial fullness, early satiety even with normal portions, nausea, and possibly vomiting. These complex symptoms hindered respondents from performing their usual daily routines.

The analysis further showed that a majority of respondents experienced multiple dyspeptic symptoms. A total of 82 respondents (77.36%) reported upper abdominal pain or discomfort, while 73 respondents (68.87%) experienced postprandial fullness. Additionally, 71 individuals (66.98%) reported a burning sensation in the upper abdomen, and 76 respondents (71.7%) experienced early satiety. Nausea or vomiting was reported by 81 respondents (76.42%), and 78 individuals (73.58%) indicated that these symptoms interfered with their daily activities.

Dyspepsia is a digestive disorder characterized by various upper gastrointestinal symptoms. Common symptoms include epigastric pain or discomfort, nausea, bloating due to gas accumulation, and frequent belching. These symptoms can be persistent or recurrent and significantly affect quality of life. Many patients report early satiety with small amounts of food followed by a prolonged feeling of fullness (Fitria et al, 2024).

This finding is supported by previous studies. In research conducted by Lenga et al. (2022), 67 respondents (41.9%) were classified as normal (no dyspepsia), while 57 (35.5%) had mild dyspepsia, 34 (21.3%) had moderate dyspepsia, and 2 (1.3%) experienced severe dyspepsia. Another study found similar results among 63 respondents with dyspepsia, 23 (36.5%) had mild dyspepsia, 29 (46.0%) moderate, 10 (15.9%) severe, and 1 (1.6%) very severe (Andriyanti 2021).

Based on the analysis, the severity of dyspepsia among patients at Teluk Tiram Public Health Center varied, with most experiencing severe symptoms. This condition is likely influenced by various contributing factors such as age, gender, dietary patterns, and stress levels.

Distribution of Dietary Patterns in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

The results of this study in the working area of Teluk Tiram Public Health Center, Banjarmasin City, show that the majority of respondents had poor dietary patterns. According to Table 4, a total of 82 respondents (77.4%) had poor dietary patterns, while only 24 respondents (22.6%) had good dietary patterns. Thus, respondents with unhealthy eating habits were the most dominant group in this study.

The frequency distribution of the dietary pattern questionnaire revealed that most respondents tended to adopt unhealthy or poor eating behaviors. This was evident from the proportion of respondents who did not consume staple foods three times a day (66.98%) and the fact that only 50% had breakfast on time, both of which play a critical role in maintaining metabolic stability. The low daily intake of fruits and vegetables (40.57%) also indicates a lack of dietary fiber and micronutrients, which could impair immunity and disrupt digestive function.

Conversely, the majority of respondents reported frequent consumption of fatty foods (83.96%), sweet foods (72.64%), spicy foods (86.79%), and acidic foods (60.38%), all of which are major risk factors for gastric disorders such as dyspepsia, gastritis, and acid reflux. In addition, the habit of eating heavy meals or snacks late at night (46.23%) contributes to digestive system disturbances, particularly when the body's metabolism slows down at night.

Although most respondents met their daily fluid intake needs (78.3%) and consumed carbohydrate sources (97.17%), these behaviors alone are insufficient to balance overall dietary quality. Poor dietary patterns, when maintained over the long term, may trigger

chronic health problems including digestive disorders, overweight, and other metabolic diseases.

Dietary patterns are among the key factors influencing the onset of dyspepsia. Irregular eating habits, eating in a rush, and inconsistent meal times can lead to dyspeptic symptoms. Dietary patterns refer to the combination of types and quantities of food consumed by an individual or group over a specific period. The habit of consuming spicy or acidic foods and beverages increases the likelihood of developing dyspeptic symptoms. Although high gastric acidity serves to kill pathogenic microorganisms ingested with food, if the gastric mucosal barrier is compromised, the acidity may aggravate irritation of the stomach lining (Aprilia et al, 2024).

In conclusion, poor dietary patterns play a critical role in triggering dyspepsia. Irregular meal schedules, fast eating, and the consumption of spicy or acidic foods increase the risk. While gastric acid is essential for destroying harmful bacteria, when the stomach's protective lining is damaged, this acid may worsen irritation and inflammation.

Distribution of Stress Levels in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

Based on the findings presented in Table 5, stress levels among respondents in the working area of Teluk Tiram Public Health Center, Banjarmasin City, were distributed as follows: 53 respondents (50%) experienced mild stress, 46 respondents (43.3%) experienced moderate stress, and 7 respondents (6.6%) experienced severe stress. This indicates that mild stress was the most common category, experienced by half of the study population.

Stress is one of the contributing factors to the incidence of dyspepsia. The greater the level of stress experienced by an individual, the higher the likelihood of digestive disturbances including dyspepsia. Stress can affect digestive function by stimulating excessive gastric acid secretion, impairing gastric motility, and reducing blood flow to the gastrointestinal tract, all of which may worsen dyspeptic symptoms. Therefore, higher levels of stress are often associated with greater severity of dyspepsia symptoms such as burning pain, bloating, and nausea (Amelia 2022).

The frequency distribution analysis of the stress questionnaire revealed that most respondents were categorized as experiencing mild stress, as indicated by the dominance of "Sometimes" responses on most questionnaire items. These responses reflect that stress symptoms were present periodically but had not yet significantly disrupted social functioning or daily activities.

The most common mild stress symptoms included feelings of anger due to unexpected events, difficulty controlling important aspects of life, anxiety, and emotional pressure. These findings indicate that respondents are vulnerable to stress although its intensity remains tolerable and can still be managed adaptively. However, certain indicators such as difficulty regulating emotions or completing tasks also reflect psychological pressure that may escalate if not addressed properly.

Relationship Between Gender and the Incidence of Dyspepsia in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

The study identified a significant relationship between gender and dyspepsia incidence, with females more frequently affected by severe dyspepsia symptoms (59.4%) compared to males (16.0%). The Spearman's rank correlation test showed a p-value of 0.034

and a correlation coefficient of 0.206, indicating a weak but positive association between gender and dyspepsia, where females had a higher tendency to experience the condition.

Several behavioral and biological factors may explain this trend. Women are more likely to engage in restrictive dieting and irregular eating patterns, often driven by concerns about body image. They also tend to be more emotionally responsive, making them more susceptible to psychological stress that can stimulate gastric acid production. Wibawani et al. (2021) noted that female hormonal reactivity, especially involving gastrin, tends to be higher, contributing to increased acid secretion.

These findings are supported by Lestari et al. (2022), who reported that 71.7% of dyspeptic respondents were female. A significant association was found between gender and dyspepsia among adults aged 15 to 64 years ($p = 0.035$).

Hormonal fluctuations during menstruation, pregnancy, or menopause may influence gastric motility and visceral sensitivity in women, leading to increased dyspeptic symptoms such as bloating and epigastric pain. In contrast, men may engage in dyspepsia-triggering behaviors like smoking, alcohol intake, and consumption of spicy or fatty foods. Lifestyle differences, stress levels, and physical activity also contribute to this gender-based variation in dyspepsia risk.

Neurological studies reveal that women exhibit greater brain activity in regions related to visceral pain, such as the anterior cingulate cortex and insula, which supports the hypothesis that women have heightened visceral sensitivity. They are also more likely to report symptoms and seek healthcare, possibly contributing to higher dyspepsia detection in females.

This is consistent with Da Silva et al. (2023), who found that female rats exhibited greater neural activity in pain and emotion-related brain areas, including the insula, prelimbic cortex, and amygdala, during colorectal distension. While conducted in animals, the findings suggest potential biological mechanisms behind gender differences in pain perception and dyspepsia susceptibility.

Relationship Between Age and the Incidence of Dyspepsia in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

This study found a significant relationship between age and the incidence of dyspepsia in the working area of Teluk Tiram Public Health Center. Most severe cases were observed in the early elderly age group (46–55 years), with the Spearman's rank correlation test yielding a p -value of 0.000 and a coefficient of -0.462 . These results indicate a moderately strong negative correlation, meaning the risk of dyspepsia increases with age.

Elderly individuals are more vulnerable to dyspepsia due to physiological changes such as thinning of the gastric mucosa, making them more susceptible to *Helicobacter pylori* infection and autoimmune conditions. In contrast, among younger populations, dyspepsia is typically linked to poor dietary habits and lifestyle behaviors. As Puteri and Yuristin (2022) noted, adolescents often neglect meals like breakfast and consume foods that stimulate excessive gastric acid, increasing the risk of gastric inflammation and ulcers.

This trend aligns with findings by Mariati Saad et al. (2024), who reported that 59.6% of dyspeptic respondents were between 20 and 60 years of age. A significant relationship between age and dyspepsia was confirmed ($p = 0.011$). Similarly, Wibawani et al. (2022) highlighted a rising prevalence of dyspepsia in older age groups, especially among those aged 45 years and above, due to more complex life stressors and health conditions. While organic

dyspepsia tends to affect older adults, younger individuals are more prone to functional dyspepsia, which is often stress-related.

Furthermore, long-term use of medications such as NSAIDs, antihypertensives, and antidiabetics among older adults may increase gastrointestinal risks. Ju et al. (2024) demonstrated a causal link between prolonged antidiabetic drug use and gastrointestinal disorders, including dyspepsia, using Mendelian randomization analysis. On the other hand, younger individuals typically have stronger gastric defenses and fewer comorbidities, reducing their susceptibility.

Dyspepsia is generally categorized as either organic, caused by identifiable gastrointestinal conditions such as GERD or gastritis, or functional, where no clear physical abnormalities are found. Functional dyspepsia is associated with psychological stress, anxiety, and poor eating habits, including frequent intake of spicy, fatty foods, caffeine, and alcohol (Amelia 2022).

Relationship Between Dietary Patterns and the Incidence of Dyspepsia in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

The study revealed a significant relationship between dietary patterns and the incidence of dyspepsia in the working area of Teluk Tiram Public Health Center. Poor dietary patterns were predominantly found among individuals with severe dyspepsia (75.5%), while good dietary patterns were only present in those with mild symptoms (22.6%). The Spearman's rank correlation test showed a p-value of 0.000 and a strong negative correlation coefficient (-0.949), indicating that the better the dietary pattern, the lower the risk of dyspepsia.

Unhealthy eating habits such as skipping meals, eating too quickly, consuming spicy, acidic, or fatty foods, and not eating breakfast were common among dyspepsia sufferers. Most respondents reported insufficient daily intake of fruits and vegetables, far below the recommended 400 grams per day. Skipping breakfast and irregular meal timing have been shown to increase gastric acid production on an empty stomach, exacerbating dyspepsia symptoms (Wibawani et al, 2021; Aprilia et al, 2024; Rasidi, 2022).

Supporting evidence from previous studies further confirms the link. Diani (2023) reported that individuals with poor dietary patterns were 3.417 times more likely to develop dyspepsia. Similarly, Lestari et al. (2022) found that 93.5% of respondents with dyspepsia had irregular meal patterns, with significant association shown by a p-value of 0.001.

Nevertheless, not all individuals with poor diets develop dyspepsia, suggesting the involvement of psychological, genetic, physiological, and adaptive factors. Lee et al. (2018) emphasized that genetic variations such as GNB3, serotonin and dopamine receptor genes and differences in gut microbiota may affect visceral sensitivity and gastric function. Some individuals may have higher pain thresholds, better motility, or adaptive neural responses that protect them from symptoms despite similar dietary exposures.

These adaptive mechanisms, including reduced sensitivity of visceral receptors and consistent meal routines, enable certain individuals to tolerate dyspepsia-triggering foods without adverse effects. This highlights the complex interplay between diet and individual biological variability in the development of dyspepsia.

Relationship Between Stress and the Incidence of Dyspepsia in the Working Area of Teluk Tiram Public Health Center, Banjarmasin City

The study demonstrated a significant relationship between stress levels and the incidence of dyspepsia in the working area of Teluk Tiram Public Health Center. Based on Table 9, mild stress was reported by 27 respondents (25.5%) with severe dyspepsia and by 26 individuals (24.5%) with mild symptoms. Moderate stress was found in 46 individuals (43.4%) with severe dyspepsia, while none with mild dyspepsia experienced this level of stress. Severe stress was reported by 7 individuals (6.6%) and was exclusively associated with severe dyspepsia.

The Spearman's rank test yielded a p-value of 0.000 and a correlation coefficient of 0.554, indicating a moderate positive correlation between stress levels and dyspepsia. This suggests that higher stress levels are associated with an increased likelihood of experiencing dyspepsia. All respondents with moderate to severe stress were found within the dyspepsia group, reinforcing the association between psychological distress and gastrointestinal symptoms.

This finding aligns with Drossman and Hasler (2016), who explained that psychological stress affects digestive function through sympathetic nervous system activation and the release of stress hormones such as cortisol and adrenaline. These hormones can alter gastric motility, elevate acid production, and increase visceral sensitivity, which can trigger dyspeptic symptoms.

Further analysis of the stress questionnaire responses showed that the dominant category was moderate stress, characterized by responses of "Sometimes" to most items. One of the most frequently selected responses was to the question, "How often in the past month have you felt unable to control important things in your life?" This highlights that a common source of moderate stress among respondents was the occasional perceived loss of control over major life responsibilities.

This perception reflects the broader psychosocial context, where individuals often face high life demands but feel limited in their capacity to manage them effectively. As Syafitri (2024) notes, moderate stress typically lasts from a few hours to a few days and can cause symptoms such as difficulty resting, fatigue, irritability, and restlessness. If left unaddressed, such stress may progress to chronic conditions, increasing the risk of functional gastrointestinal disorders like dyspepsia.

CONCLUSION

This study found a significant relationship between age, gender, dietary patterns, and stress levels with the incidence of dyspepsia in the working area of Teluk Tiram Public Health Center, Banjarmasin City. The Spearman's rank test indicated that dietary pattern had the strongest correlation with dyspepsia incidence, followed by stress, age, and gender. Individuals with irregular eating habits, high stress levels, older age, and female gender were more likely to experience dyspepsia. These findings emphasize the importance of addressing lifestyle and psychological factors in the prevention and management of dyspepsia at the level of primary healthcare services.

Based on the results of this study, it is recommended that Teluk Tiram Public Health Center and local healthcare professionals take a more proactive role in educating the public about the importance of healthy dietary patterns and stress management in preventing dyspepsia. Health promotion and preventive programs should prioritize vulnerable groups, such as the elderly and women. Additionally, routine screening for dyspepsia symptoms

should be strengthened to enable early intervention. Future research is encouraged to explore other potential contributing factors such as socioeconomic status, occupation, and smoking habits, which may also influence the incidence of dyspepsia.

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