

Association Between Spicy Meal Habit, Meal Timing, and Gastritis 1 Symptoms Among Generation Z in the Greater Jakarta Metropolitan 2 Area (Jabodetabek)

Firda Silta Maulani^{1*}, Khoirul Anwar¹

¹ Nutrition Study Program, Faculty of Food Technology and Health, Sahid University

*Correspondence : maulanif53@gmail.com

ABSTRACT

Background: Gastritis is a digestive disorder caused by inflammation of the stomach lining, characterized by symptoms such as nausea, vomiting, epigastric pain, bloating, and stomach discomfort. This condition is common among people of working age, particularly Generation Z, with a prevalence of 40.8% in Indonesia due to unhealthy eating habits. A hectic lifestyle, the trend of consuming spicy foods, and irregular eating habits are factors that potentially increase the risk of developing gastritis.

Objective: This study aims to analyze the relationship between spicy food consumption and meal timing on gastritis symptoms among Generation Z in the Greater Jakarta area.

Materials and methods: This study used a cross-sectional design involving 100 respondents selected using non-probability sampling via purposive sampling. Data on gastritis symptoms were collected using a gastritis symptom questionnaire; data on spicy food consumption were collected using a Food Frequency Questionnaire (FFQ); and data on meal timing were collected using a meal timing questionnaire. Data analysis was performed using the chi-square test and ANOVA.

Results: The results of the analysis showed no significant association between spicy food consumption ($p=0.686$) and daily meal times ($p>0.05$) and gastritis symptoms. The analysis results showed that the habit of eating dinner was not associated with gastritis symptoms ($p=0.073$); however, the timing of dinner was significantly associated with gastritis symptoms ($p=0.040$). These results indicate that it is not the frequency of dinner that contributes to the onset of gastritis symptoms, but rather the timing of dinner.

Conclusion: Meal regularity, particularly dinner, is significantly associated with gastritis symptoms among Generation Z in the Greater Jakarta area, whereas spicy food consumption, in contrast, is not significantly associated with gastritis symptoms.

Keywords: dietary habits; meal timing; gastritis symptoms; Generation Z; Jabodetabek

BACKGROUND

Gastritis, or stomach pain, is a condition caused by digestive disorders. Gastritis occurs due to inflammation of the stomach lining, with symptoms including nausea, vomiting, weakness, abdominal bloating, epigastric pain, and a feeling of fullness.^{1,2} Gastritis is commonly experienced by adolescents and adults aged 15–25 years; most people consider the symptoms of gastritis to be a minor condition and ignore the symptoms without seeking further medical evaluation.³ Death is one of the most severe consequences of acute gastritis, as it can lead to complications such as upper gastrointestinal bleeding, peptic ulcers, fluid and electrolyte imbalances, and anemia.⁴

The World Health Organization (WHO) reports that the incidence of gastritis in Southeast Asia affects 583,635 people and is expected to rise each year.⁵ In 2022, the WHO conducted a study on the prevalence of gastritis in eight countries; Indonesia was among the countries with the highest number of cases, accounting for 40.8%.⁶ According to data from the Ministry Health of the Republic of Indonesia (Kemenkes) in 2018, the incidence of gastritis was quite high in certain cities, particularly in Jakarta at 50%.⁷ A study surveying the incidence of gastritis among the working-age population in Jakarta found

that of the 60% of the working-age population, 27% suffered from gastritis. This study also noted that the most common cause of gastritis is lifestyle-related.⁶ The prevalence of gastritis in various regions is not merely a local issue but has become a global health issue requiring greater attention.

Recently, the trend of consuming spicy food has become increasingly popular among the public, particularly in urban areas. This phenomenon is closely tied to Indonesia's culinary history, which has long utilized various spices as seasonings in food preparation. As globalization progresses, a variety of spicy dishes from around the world have also become increasingly accessible and sought after in Indonesia. The diversity of spicy food options and the ease of access to them have made spicy food one of the culinary trends that continues to grow.⁸ According to Pramesti and Ayu (2021)⁹, people enjoy spicy food because of the burning sensation and irritation caused by the compound capsaicin. In addition, spicy foods are generally prepared using relatively larger amounts of oil, resulting in a richer and more appealing flavor for consumers. The combination of the spicy sensation and these preparation characteristics is one of the factors driving the growing popularity of spicy foods among the public.⁹

Dietary patterns can reflect the variety and quality of foods typically consumed by an individual. A varied and balanced diet can help the body achieve optimal nutritional status.¹⁰ A dietary pattern can be considered unhealthy when a person begins to excessively consume foods that can cause health problems.¹¹ According to (Tahara *et al.*, 2021),¹² irregular eating habits—such as inconsistent mealtimes and skipping meals—also constitute dietary patterns that contribute to an increase in health problems, particularly digestive disorders.¹²

Digestive disorders can occur due to various factors, including diet, stress, and bacterial infections.¹³ The productive age group is particularly vulnerable to digestive disorders, one of which is gastritis. Symptoms of gastritis can arise from a heavy workload and busy schedules that lead to unhealthy eating habits.⁷ Currently, the working-age population is dominated by Generation Z (Gen Z). Gen Z is a demographic group born between 1997 and 2008; during this generation's formative years, technological advancements have progressed at a rapid pace, causing Gen Z's lifestyle to evolve more quickly due to demanding daily routines and technological advancements.⁶

According to a previous study, 61.2% of adolescents have poor eating habits, particularly regarding the consumption of spicy foods, and 57.1% of them suffer from gastritis.⁶ Another study also demonstrated a link between spicy food consumption and the incidence of gastritis ($p=0.000$).¹¹ Furthermore, Li *et al.* (2020)¹⁴ identified that the habit of consuming spicy foods, eating portions that are either too large or too small, and irregular mealtimes contribute to the development of gastritis. Zhou *et al.* (2023)¹⁵ also reported that consuming spicy foods can increase the desire to consume them again through physiological responses, such as increased salivation and heart rate.

Rahman *et al.* (2022)⁶ stated that cases of gastritis are more prevalent in urban areas due to the rise of unhealthy food trends and eating habits. Based on these findings, further research is needed on the relationship between spicy eating habits and meal timing and gastritis symptoms among Generation Z in the Greater Jakarta area. This study aims to provide insight into the influence of spicy food consumption and meal timing on the onset of gastritis symptoms in this age group.

MATERIALS AND METHODS

Research Design, Time, and Location

The research design employed a descriptive-analytical cross-sectional study. Cross-sectional studies can be used to identify causal relationships and generate specific hypotheses. This study was conducted from June 27 to July 30, 2025, online, covering the integrated region of Jakarta, Bogor, Depok, Tangerang, and Bekasi (JABODETABEK). The researchers shared information about the study via Instagram feeds, and information was also disseminated through WhatsApp groups. This study has received ethical approval from Prima University under ethics number 169/KPEK/UNPRI/VI/2025.

Sample Size and Sampling Method

The subjects were selected using a non-probability sampling method, specifically purposive sampling. The calculation of research subject criteria aims to reduce bias in the research results. The sample size for this study is 100 subjects, selected based on the following inclusion criteria: aged 19–28 years (Gen Z); having experienced symptoms of gastritis (epigastric pain, nausea/vomiting when meals are missed, bloating, and loss of appetite) within the past month; willing to participate in the study and provide an informed consent form, residing in the Greater Jakarta area, and being easily reachable and cooperative throughout the study. Exclusion criteria included not currently following a specific diet or fasting regimen, being uncooperative during the study, and not being pregnant or breastfeeding.

Types and Methods of Data Collection

In this study, the types of data collected included primary and secondary data. Primary data included subject characteristics (age, gender, place of residence, living status, income, occupation, and nutritional status), data on gastritis symptoms, data on spicy food consumption, and data on meal timing among Gen Z. Secondary data consisted of a screening history of gastritis symptoms and documentation of the subjects' weight and height. Data on characteristics, gastritis symptoms, consumption of spicy foods, and meal timing were collected through the completion of questionnaire forms. The instruments used in this study included respondent guidelines, a questionnaire form, a sociodemographic questionnaire, an FFQ questionnaire, a gastritis symptoms questionnaire, and a meal timing questionnaire.

Data Processing and Analysis

The data processing stages included data editing, coding, entry, and cleaning. The data were processed using Microsoft Excel 2016 and analyzed using Statistical Product and Service Solutions (SPSS) version 25 for Windows. Univariate analysis was performed to describe the characteristics of the respondents and each variable, while bivariate analysis was used to determine the relationship between the independent and dependent variables. Gastritis symptoms were categorized as “no symptoms of gastritis” if the score was below the mean and “symptoms of gastritis” if the score was above the mean. Spicy food consumption patterns were categorized as “rare” and “frequent” based on the mean score. Meal frequency was categorized as infrequent (never and rarely) and frequent, while meal punctuality was categorized as on time and not on time. Appetite distribution was determined based on the mean food consumption score. The relationships between variables were analyzed using the chi-square test with a 95% significance level ($\alpha = 0.05$). A $p\text{-value} < 0.05$ indicates a significant relationship, while a $p\text{-value} \geq 0.05$ indicates no significant relationship.¹⁶

RESULTS

Table 1 presents the distribution of participants according to their socio-demographic characteristics, including age, gender, occupation, living arrangements, monthly income, and residence. The participants were predominantly aged 19–22 years (69%) and female (75%). Most participants were students (75%) and lived with their families (94%). In terms of monthly income, 41% reported an income of less than Rp1,000,000, while 37% reported an income of Rp1,000,000–Rp3,000,000. Regarding residence, the largest proportion of participants lived in Jakarta (40%), followed by Depok (26%), Bekasi (14%), Bogor (13%), and Tangerang (7%).

The results of the study (Table 2) show that the majority of respondents had symptoms of gastritis (51%), rarely consumed spicy foods (51%), and ate only twice a day. Regarding the distribution of breakfast, lunch, and dinner, respondents rarely ate breakfast and did not eat dinner on time (67%).

Table 1. Socio-demographic characteristics distribution

Variable	n	%
Age (Year)		
19–22	69	69
23–28	31	31
Gender		
Male	25	25
Female	75	75
Job		
Student	75	75
employee	17	17
Civil Servant	1	1
Self-employed	3	3
another	4	4
Living Arrangements		
Living alone	6	6
Living with family	94	94
Monthly income (Rp)		
< Rp 1.000.000	41	41
Rp 1.000.000–Rp 3.000.000	37	37
Rp 3.000.000–Rp 5.000.000	13	13
> Rp 5.000.000	9	9
Residence		
Jakarta	40	40
Bogor	13	13
Depok	26	26
Tangerang	7	7
Bekasi	14	14

Table 2. Distribution of the variable under study

Variable	n	%
Gastritis symptoms		
No Symptoms of Gastritis (<27.5)	49	49
Symptoms of Gastritis (>27.5)	51	51
Spicy Meal Habit		
Rarely (cut score <29.5)	51	51
Often (cut score >29.5)	49	49
Meal Timing Patterns		
Meal timming (in one day)		
1 meal	3	3
2 meals	60	60
3 meals	31	31
>3 meals	6	6
Breakfast		
Never and rarely	53	53
Often	47	47
The timing of breakfast		
Not on time (< 7 am and > 9 am)	46	46
On time (7 – 9 am)	54	54
Lunch		
Never and rarely	14	14
Often	86	86
The timing of lunch		
Not on time (< 11 am and > 2 pm)	4	4
On time (11 am – 2 pm)	96	96
Dinner		
Never and rarely	48	48
Often	52	52
The timing of breakfast		
Not on time (> 7 pm)	67	67
On time (5 – 7 pm)	33	33

The Relationship Between a Spicy Meal Habit and Gastritis symptoms

The bivariate analysis in this study used the chi-square test to determine the association between Spicy Meal Habit and the incidence of gastritis symptoms among Generation Z in the Greater Jabodetabek area. Dietary patterns were categorized based on the Food Frequency Questionnaire (FFQ) into “rarely” (<median: 29.5) and “frequently” (>median: 29.5).¹⁷

Table 3. The relationship between a spicy meal habit and gastritis symptoms

Spicy Meal Habit	Gastritis symptoms				P-value	OR	CI	
	No symptoms		Symptoms				Low	Up
	n	%	n	%				
Rarely	26	51,0	25	49,0	0,686	1,176	0,536	2,577
Often	23	46,0	26	53,0				
Total	49	49,0	51	51,0				

Note: Chi-Square Test, Significance $p < 0.05$

Based on the results of statistical analysis using the chi-square test, a p-value of 0.686 ($p > 0.05$) was obtained; therefore, H1 was rejected and H0 was accepted, indicating that there is no association between a spicy meal habit and the occurrence of gastritis symptoms. In the group of respondents who rarely consumed spicy food—26 people (51%)—none experienced gastritis symptoms, while 25 people (49%) did. Meanwhile, in the group of respondents who frequently consumed spicy food, 23 people (46%) did not experience gastritis symptoms, and 26 people (53.1%) did.

The Relationship Between Meal Timing (One Day) and Symptoms of Gastritis

Bivariate analysis in this study used the chi-square test. Data on spicy food consumption were categorized based on each item. To meet the requirements for a 2x2 chi-square test, each variable was then recategorized into two broad groups—rarely and frequently—so that the data distribution would be more balanced and the analysis results could be interpreted more simply. These categories were combined to calculate the odds ratio (OR) as a measure of the strength of the association between the independent variable and the occurrence of gastritis.

Table 4. The relationship between a spicy meal habit and gastritis symptoms

Meal Timing (one day)	Gastritis symptoms				P-value	OR	CI	
	No symptoms		Symptoms				Low	Up
	n	%	n	%				
Rarely	32	50,8	31	49,2	0,64	1,214	0,538	2,74
Often	17	45,9	37	54,1				
Total	49	49.0	51	51,0				

Note: Chi-Square Test, Significance $p < 0.05$

Based on the results of a statistical analysis using the chi-square test, a P-value of 0.64 ($p > 0.05$) was obtained; therefore, H1 was rejected and H0 was accepted, indicating that there is no association between main meal timing habits and the occurrence of gastritis symptoms.

Based on a chi-square analysis of breakfast habits, the results showed no significant association between breakfast habits and symptoms of gastritis, with a p-value of 0.498 (> 0.05); therefore, H1 was rejected and H0 was accepted. Regarding the timeliness of breakfast, the results were also not statistically significant, with a p-value of 0.068 (> 0.05); therefore, there is no association between the timeliness of breakfast and the occurrence of gastritis symptoms.

Table 5. The relationship between meal timing (days) and gastritis symptoms

Breakfast timing	Gastritis symptoms				P-value	OR	CI	
	No symptoms		Symptoms				Low	Up
	n	%	n	%				
Breakfast habits								
Rarely	29	29,0	24	24,0	0,225	1,631	0,739	3,601
Often	20	20,0	27	27,0				
Total	49	49,0	51	51,0				
The timing of breakfast								
Rarely	18	39,1	28	60,9	0,068	0,477	0,214	1,063
Often	31	57,4	23	42,6				
Total	49	49,0	51	51,0				

Note: Chi-Square Test, Significance $p < 0.05$

Table 6. The relationship between the timing of l and symptoms of gastritis

Lunch timing	Gastritis symptoms				P-value	OR	CI	
	No symptoms		Symptoms				Low	Up
	n	%	n	%				
Lunch habits								
Rarely	7	7,0	7	7,0	0,936	1,048	0,339	3,242
Often	42	42,0	44	44,0				
Total	49	49,0	51	51,0				
The timing of lunch								
Rarely	2	50,0	2	50,0	0,967	1,043	0,141	7,707
Often	47	49,0	49	51,0				
Total	49	49,0	51	51,0				

Note: Chi-Square Test, Significance $p < 0.05$

Based on a chi-square analysis of lunch habits, no significant association was found between lunch habits and symptoms of gastritis, with a p-value of 0.936 (> 0.05); therefore, H1 was rejected and H0 was accepted. Regarding the punctuality of lunch, the results were also not statistically significant, with a p-value of 0.967 (> 0.05); thus, there is no association between the punctuality of lunch and the occurrence of gastritis symptoms.

Table 7. The relationship between the timing of dinner and symptoms of gastritis

Dinner timing	Gastritis symptoms				P-value	OR	CI	
	No symptoms		Symptoms				Low	Up
	n	%	n	%				
Dinner habits								
Rarely	28	28,0	20	20,0	0,073	2,067	0,931	4,588
Often	21	21,0	31	31,0				
Total	49	49,0	51	51,0				
The timing of dinner								
Rarely	28	41,8	39	58,2	0,040	0,410	0,176	0,969
Often	21	63,6	12	36,4				
Total	49	49,0	51	51,0				

Note: Chi-Square Test, Significance $p < 0.05$

Based on a chi-square analysis of dinner eating habits, no significant association was found between dinner eating habits and gastritis symptoms, with a p-value of 0.073 (> 0.05); therefore, H1 was rejected and H0 was accepted. However, regarding the timeliness of dinner, a significant result was found with a p-value of 0.040 (< 0.05), indicating that there is a relationship between the timeliness of dinner and the occurrence of gastritis symptoms.

DISCUSSION

Sociodemographic characteristics such as age, gender, occupation, housing status, income (per month), and place of residence are some of the factors that influence the symptoms of gastritis. According to previous research, women are 6.7 times more likely to develop gastritis than men.¹⁸ A study by Yunanda *et al.* (2021)⁷ found that women's hormones are more reactive than men's, so gastric secretion can be regulated by neural and hormonal mechanisms. The hormone gastrin acts on the gastric glands and triggers an additional flow of highly acidic gastric juice.

People of working age are particularly susceptible to gastritis due to their busy schedules and unhealthy lifestyles, which lead them to neglect their dietary intake.³ Meanwhile, according to Yunanda *et al.* (2023)⁷, half of the study subjects with gastritis were aged 26–35 years; they noted that as age increases, productivity rises, and the body's response to certain conditions can potentially lead to stress.⁷ Based on research by Nilasari *et al.* (2024)¹⁹, occupation influences the incidence of gastritis, as high pressure and heavy workloads can lead to irregular eating patterns.¹⁹

According to a study by Feyisa and Woldeamanuel (2021)²⁰, low income is associated with a higher risk of gastritis. Individuals with lower incomes tend to have limited access to healthy foods, consume inexpensive foods that are less nutritious or irritating more frequently, and are less able to maintain a regular eating pattern. The Greater Jakarta area, as an urban center characterized by a fast-paced lifestyle, relatively high stress levels, and a tendency to consume fast food and spicy foods, can influence the eating patterns of Generation Z living in the region. Based on a previous study, Rahman *et al.* (2022)⁶ stated that their findings indicate gastritis most frequently affects people of working age. Aprillia and Adelina (2023)²¹, who examined gastritis among adolescents, noted that the majority of respondents had poor dietary habits that put them at risk for gastritis; most had irregular meal frequencies, inconsistent mealtimes, and consumed foods that irritate the stomach.

Based on the research findings, 51% of respondents experienced symptoms of gastritis. Gastritis, commonly known as stomach pain, is a digestive disorder whose most common symptom is pain, with common manifestations including nausea, vomiting, weakness, bloating, epigastric pain, and a feeling of tightness.^{1,7} According to Nurprilinda *et al.* (2024)²², not everyone with gastritis symptoms necessarily has gastritis because many symptoms, such as epigastric pain, nausea, vomiting, and bloating, are also found in other digestive disorders and are not specific to gastritis. Therefore, further examinations such as endoscopy and histopathological examination are necessary to establish the diagnosis.

Based on the analysis of 14 questions regarding gastritis symptoms, the three highest total scores were stomach pain or discomfort when meals are delayed (score 256), stomach pain or discomfort when skipping lunch (score 225), and frequent loss of appetite (score 209), indicating that these were the most prevalent complaints reported by the respondents and were related to an empty stomach resulting from delayed meals. Stomach pain or discomfort that occurs when a meal is delayed or skipped is the most common symptom experienced by people with gastritis because stomach acid production remains high even in the absence of food to neutralize it, causing irritation of the inflamed stomach lining.²³ A study in Medan found that delaying a meal by 2–3 hours can increase the risk of gastritis.²⁴ Furthermore, a decreased appetite can reduce food intake, causing the stomach to remain empty for longer periods, thereby facilitating gastric acid irritation of the stomach lining and exacerbating gastritis symptoms.²³

Most respondents had the habit of eating twice a day (60.0%), followed by three times a day (31.0%), more than three times a day (6.0%), and once a day (3.0%). Meal frequency affects a person's metabolism. Data on breakfast consumption showed that 47.0% of respondents frequently ate breakfast, and 54.0% of respondents ate breakfast on time. Regarding lunch, 86.0% of respondents frequently ate lunch, and 96.0% maintained good punctuality for lunch. These results align with the study by Almuammar *et al.* (2023)²⁵, which states that individuals tend to be more punctual for lunch than for breakfast and dinner due to scheduled lunch breaks in work and educational settings. Meanwhile, skipping breakfast is known to increase the risk of cardiovascular disease and reduce energy levels for daily activities²⁶.

In contrast to lunch, dinner showed a higher level of irregularity, with 52.0% of respondents frequently eating dinner. Based on punctuality, 67.0% of respondents did not eat dinner on time. Halawa *et al.* (2022)²⁷ state that the ideal time for dinner is 3–4 hours before bedtime to ensure optimal digestion. In line with this, Tahara *et al.* (2021)¹² reported that irregular meal times are associated with lower breakfast frequency, the habit of snacking at night, and unhealthy eating patterns, while eating dinner late can increase the risk of digestive disorders, including gastritis.

Based on the findings regarding the relationship between a spicy meal habit and gastritis symptoms, the consumption of spicy foods is not a factor directly associated with the onset of gastritis symptoms in the study population. This contrasts with the study by Lonah *et al.* (2024)²⁸, which found an association between spicy foods and the incidence of gastritis with a p-value of 0.000. In a study by Lusiana and Suprayitno (2020)²⁹, a significant association was found between a spicy meal habit and the occurrence of gastritis symptoms in individuals aged 20–45 years, with a p-value of 0.000. A cross-sectional study in Spain involving gastrointestinal complaints concluded that the frequency of spicy food consumption did not differ significantly between groups with or without epigastric or retrosternal symptoms, with a p-value of 0.992.³⁰

According to Bela *et al.* (2022)¹¹, regular or excessive consumption of spicy foods stimulates the digestive system particularly by increasing gastric secretion which can raise the risk of gastritis and exacerbate its symptoms. This is consistent with a study by Li *et al.* (2020)¹⁴, which found that moderate consumption of spicy foods is associated with a lower risk of gastritis. According to Rahman *et al.* (2022)⁶, when spicy foods are consumed, the body takes longer to digest them and transport them through the intestines. As a result, stomach contents and gastric acid are under greater pressure before being transported to the intestines; when acid is released, this is what causes epigastric pain and irritation in the stomach.

Based on the results of the Chi-square test, daily eating habits were not associated with symptoms of gastritis ($p=0.269$). These results are inconsistent with the study by Aprillia and Adelina (2023)²¹, which reported that irregular meal frequency was associated with the incidence of gastritis ($p=0.000$). According to Li *et al.* (2020)¹⁴, irregular meal times can cause abdominal pain and bloating, while eating fewer than three times a day increases the risk of gastritis because the stomach remains empty for longer periods, leading to increased stomach acid production that irritates the gastric mucosa. In addition, a recommended meal frequency consists of three main meals and two snacks each day.¹⁴

In contrast to daily eating patterns, the analysis results showed that the habit of eating dinner was not associated with gastritis symptoms ($p=0.073$); however, the timing of dinner was significantly associated with gastritis symptoms ($p=0.040$). These results indicate that it is not the frequency of dinner that contributes to the onset of gastritis symptoms, but rather the timing of dinner.

CONCLUSIONS

Based on the research findings, the majority of respondents were Generation Z members aged 19–22, female, college students, living with their families, and earning less than Rp1,000,000 per month. Most respondents consumed spicy food only rarely, while their meal timing was generally poor, particularly in terms of skipping breakfast or eating dinner at irregular times. The analysis results show that a spicy meal habit is not significantly associated with gastritis symptoms ($p=0.686$). Conversely, the regularity of mealtimes, particularly dinner, is significantly associated with gastritis symptoms ($p=0.040$). Therefore, the regularity of mealtimes, especially dinner, is a factor associated with the occurrence of gastritis symptoms among Generation Z in the Greater Jakarta area.

The sample distribution in this study is not yet fully representative of the Generation Z population in the Greater Jakarta area. Therefore, it is recommended that future studies include a more even distribution of the sample across each region of the Greater Jakarta area. Data on gastritis symptoms should be supplemented with medical diagnoses to strengthen the validity of the study's findings.

REFERENCES

1. Anika M, Neri EL, Ligita T. 2024. Hubungan tingkat pengetahuan gastritis dengan kejadian gastritis pada mahasiswa mahasiswi Program Studi Keperawatan FK UNTAN. *Tanjungpura J Nurs Pract Educ*. 6(2):28–34. doi:10.26418/tjnpe.v6i2.75598.
2. Putri LA. 2023. Hubungan pola makan dan tingkat stres dengan tingkat kekambuhan gastritis pada pasca masa pandemi (studi di mahasiswi Universitas Negeri Semarang). *Nutrizione (Nutrition Research and Development Journal)*. 3(1):23–29. doi:10.15294/nutrizione.v3i1.66280.
3. Anizal RK, Soebiantoro U. 2023. The effect of product and brand image on purchasing decisions for chili sauce products ABC brand instant in Kediri City. *Int J Multidiscip Res Anal*. 6:4062–4068.
4. Zuhair RD, Susanti N, Pranita M, Jannah MM, Zahra MU, Saragih PA, *et al*. 2023. Hubungan antara pola makan dan stres terhadap kejadian penyakit gastritis di Desa Tembung Kecamatan Percut Sei Tuan. *J Keperawatan Kesehatan Masy*. 12(2):133–141. doi:10.31596/jcu.v12i2.1603
5. Afida UN, Nugraheni WT, Ningsih WT. 2023. Tingkat stres dan kekambuhan gastritis pada penderita gastritis di Desa Tlogowaru wilayah kerja Puskesmas Temandang. *J Multidisiplin Indones*. 2(8):1902–1908.
6. Rahman IA, Nurapandi A, W EMJ, Kurniawan R, Risgia G. 2022. The relationship between diet and gastritis in adolescents. *J VNUS Vocat Nurs Sci*. 4:50–59.
7. Yunanda FT, Wahyurianto Y, Retna TP, Triana WN. 2023. Gambaran faktor penyebab terjadinya gastritis di Desa Tlogowaru wilayah kerja Puskesmas Temandang Kabupaten Tuban. *J Multidisiplin Indones*. 2:1742–1757.
8. Suseno AN, Prawiradilaga RS, Mohamad PB. 2022. Hubungan kebiasaan mengonsumsi makanan pedas dengan indeks massa tubuh pada wanita dewasa di Kota Tasikmalaya pada tahun 2021. *Bandung Conf Ser Med Sci*. 2(1):145–152.
9. Pramesti II, Putri D. 2024. Hubungan durasi tidur dan kebiasaan konsumsi makanan pedas dengan kejadian obesitas pada mahasiswa Politeknik Negeri Jember. *Harena J Gizi*. 4(3):108–114. doi:10.25047/harena.v4i3.4897.
10. Putri RVI, Rachman TA. 2023. Hubungan pola makan dengan status gizi pada mahasiswa indekos Jurusan Gizi Fakultas Kedokteran Universitas Sultan Ageng Tirtayasa. *J Ilmu Kesehat Gizi (JIG)*. 1(3):58–64. doi:10.55606/jikg.v1i3.1345.
11. Bela NKS, Widajati E, Adelina R. 2022. Hubungan konsumsi lemak hewani, makanan pedas, dan minuman tinggi kafein dengan kejadian gastritis pada mahasiswa Poltekkes Kemenkes Malang (studi pendahuluan). *J Nutr*. 1:21–28.
12. Tahara Y, Makino S, Suiko T, Nagamori Y, Iwai T, Aono M, *et al*. 2021. Association between irregular meal timing and the mental health of Japanese workers. *Nutrients*. 13(8):2775. doi:10.3390/nu13082775.
13. Husen A, Tjandra L. 2023. Analisis hubungan faktor pola makan dan stress dengan kejadian gastritis. *Calvaria Med J*. 1:68–75.
14. Li Y, Su Z, Li P, Li Y, Johnson N, Zhang Q, *et al*. 2020. Association of symptoms with eating habits and food preferences in chronic gastritis patients: a cross-sectional study. *Evid Based Complement Alternat Med*. 2020:5197201. doi:10.1155/2020/5197201.
15. Zhou Y, Liu Y, Yang C, Chen H. 2023. Reactivity to food cues in spicy food cravers: physiological and behavioral responses. *Physiol Behav*. 265:114157. doi:10.1016/j.physbeh.2023.114157.
16. Senjaya S, Hernawaty T, Hendrawati, DA IA. 2022. Hubungan mekanisme coping dengan imun pada ODHA selama pandemi COVID-19. *SENTRI J Ris Ilm*. 1:1026–1042.
17. Kirani P. 2022. Pengaruh kebiasaan makan makanan pedas terhadap kejadian sindrom dispepsia fungsional di Poliklinik Penyakit Dalam Rumah Sakit Umum Haji Medan. Medan (ID): Universitas Muhammadiyah Sumatera Utara.
18. Suwindri, Tiranda Y, Ningrum WAC. 2021. Faktor penyebab kejadian gastritis di Indonesia: literature review. *J Keperawatan Merdeka (JKM)*. 1:209–223.

19. Nilasari, Rezal F, Meliahsari R. 2024. Hubungan pengetahuan, pola makan dan aktivitas fisik terhadap kejadian penyakit gastritis pada wanita pekerja kantoran di wilayah Kelurahan Kemaraya Kec. Kendari Barat tahun 2023. *J Wawasan Promosi Kesehat.* 6:29–34.
20. Feyisa ZT, Woldeamanuel BT. 2021. Prevalence and associated risk factors of gastritis among patients visiting Saint Paul Hospital Millennium Medical College, Addis Ababa, Ethiopia. *PLoS One.* 16(2):e0246619. doi:10.1371/journal.pone.0246619.
21. Aprillia R, Adelina R. 2023. Hubungan pola makan dengan risiko gastritis pada mahasiswa diploma tingkat akhir. *Nutr Diaita.* 15:30–37.
22. Nurprilinda M, Gultom FL, Banjarnahor AAM. 2024. Profile and histopathological description of gastritis patients. *Int J Res Rev.* 11:510–517.
23. Akram M, Mahmood A, Umaru IJ, Hasan MK, Abdulghafoor HA, Khan FS, *et al.* 2025. Understanding gastritis: causes, symptoms, diagnosis, and management. *Afr J Med Surg Public Health Res.* 2(2):302–306. doi:10.58578/ajmsphr.v2i2.5580.
24. Tanjung SR, Sinuraya E, Suharto. 2023. Pendidikan kesehatan keluarga tentang pola makan pada keluarga dengan masalah kesehatan gastritis di wilayah UPT Puskesmas Pulo Brayan. *SENTRI J Ris Ilim.* 2:3907–3919.
25. AlMuammar S, Algarni AA, Badroun F, Mushaeb HH. 2023. Meal timing habits among adults in Saudi Arabia: a cross-sectional study. *Adv Public Health.* 2023:3932024. doi:10.1155/2023/3932024.
26. Park H, Shin D, Lee KW. 2023. Association of main meal frequency and skipping with metabolic syndrome in Korean adults: a cross-sectional study. *Nutr J.* 22:24. doi:10.1186/s12937-023-00852-x.
27. Halawa DAPT, Sudargo T, Siswati T. 2022. Makan pagi, aktivitas fisik, dan makan malam berhubungan dengan status gizi remaja di Kota Yogyakarta. *J Nutr Coll.* 11:135–142.
28. Lonah, Arieselia Z, Kurniawan SV, Hananta L, Setiawan J, Surjono E, *et al.* 2024. Assessing the correlation between spicy food consumption and dyspepsia symptoms in medical and health students at Atma Jaya Catholic University of Indonesia. *J Urban Health Res.* 2(3):18–25.
29. Lusiana A, Suprayitno. 2020. Hubungan jenis makanan dengan kejadian gastritis pada kelompok usia 20–45 tahun di wilayah kerja Puskesmas Bengkuring Kota Samarinda tahun 2019. *Borneo Student Res.* 1:2016–2021.
30. Puig-Moltó M, Lumbreras B, López-Pintor E. 2023. Prevalence and risk factors of upper gastrointestinal symptoms in community pharmacies in Spain: a cross-sectional study. *Front Pharmacol.* 14:1162370. doi:10.3389/fphar.2023.1162370.