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Risk Factors for Gastritis Among Nursing Students: A Cross Sectional Study

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Abstract:
Gastritis is characterized by symptoms such as nausea, vomiting, dull epigastric pain, upper abdominal discomfort, early satiety, and loss of appetite. Some patients also report dizziness and neck discomfort. Without proper treatment, gastritis may progress to gastroesophageal reflux disease (GERD), causing severe symptoms such as chest pain, heartburn, and sleep disturbances, which can significantly reduce productivity. Gastritis commonly affects individuals in their productive years, including students, due to irregular eating patterns, poor sleep quality, and high stress levels. This study aims to identify the dominant risk factors contributing to gastritis among nursing students. The research of an observational analytic design with a cross-sectional approach was employed. A total of 107 students were purposive sampling technique based on inclusion criteria: being active nursing students with a history of gastritis. Data were collected using dietary patterns questionnaires, Pittsburgh Sleep Quality Index (PSQI), the Depression, Anxiety, and Stress Scales (DASS), and gastritis symptoms questionnaires. Data were analyzed using chi-square and logistic regression with a significance level of $p<0.05$. Results indicated that 52.3% had poor dietary patterns, 90.7% had poor sleep quality, and 26.2% experienced stress. Logistic regression analysis revealed that stress was the most dominant risk factor (OR=11.78; 95% CI: 3.72–37.29; $p<0.001$), followed by dietary pattern (OR=2.49; 95% CI: 1.02–6.08; $p=0.046$), while sleep quality showed no significant association ($p=0.448$). In conclusion, stress is the primary risk factor for gastritis among nursing students. Therefore, stress management and lifestyle interventions are necessary to prevent gastritis and promote students' well-being.

Keywords: gastritis, dietary patterns, sleep quality, stress

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INTRODUCTION

Inflammation of gastric mucosa (*gastritis*) in students needs serious attention because of its negative impact on their quality of life and productivity (Li, 2024). Gastritis can affect the gastric function and increase the likelihood of developing chronic gastritis (72%), gastric cancer (64%), and gastrointestinal bleeding (32%), and can be life-threatening if not treated properly (Kim et al., 2021; Mohapatro et al.,

2024; Rodliya, 2022; Romanda, 2019). Typical signs of gastritis include loss of appetite, fullness, discomfort and pain in the upper abdomen, nausea and vomiting, indigestion, bloating, vitamin B12 deficiency, and pernicious anemia (Ahmed Ghanem et al., 2019; Jusuf et al., 2022; Rugge et al., 2020a, 2021).

Approximately 10 percent of the world's population suffers from gastritis (Safii & Andriani, 2019). According to WHO, the percentage of gastritis in several countries is 69% in Africa, 78% in South America, 29.5% in France, 22% in England, 31% in China, 14.5% in Japan, 35% in Canada, and 51% in Asia. Among the total percentage, gastritis is most prevalent in early adulthood with a percentage of 76%, while the remaining 23% are elderly individuals. The incidence of gastritis in Indonesia is high at 40.8% with a total of 274,396 cases reported among 238,452,952 people (BKPK, 2023; Feyisa & Woldeamanuel, 2021; Mohapatro et al., 2024; WHO, 2020).

Gastritis can affect individuals of all ages and genders. Several surveys show that gastritis most often affects those of productive age. A study in West Bandung indicated that the average age of respondents who experienced gastritis was 20.9 years, and 74.4% were female (Turnip et al., 2023). Similarly, a study in Gorontalo found that most respondents were 21 years old (Jusuf et al., 2022). At this productive age, individuals are susceptible to gastritis symptoms due to their busy lifestyles, which often do not prioritize health. Stress can quickly arise due to the influence of environmental factors (Umasugi et al., 2020). Gastritis is an inflammatory condition of the gastric mucosa that can trigger by various factors. Among the often mentioned causes, diet, sleep quality, and psychological stress play essential roles (Li, 2024; Rugge et al., 2021). Determining the most dominant factor among these three can provide more focused insights for developing effective prevention and treatment strategies. The treatment of gastritis and its complications poses a significant economic burden on the health system and society. Direct costs, including doctor visits, medications, and hospitalization, as well as indirect costs such as loss of academic productivity and work, present challenges in managing this disease (Chinese Society of Gastroenterology, 2023; Osyodlo et al., 2021). Therefore, identifying dominant risk factors can yield more specific insights into effective gastritis prevention and treatment strategies.

Gastritis is a disease that often recurs throughout life and shows inflammation of the gastric mucosa (Cantay & Büyüksandalyacı Tunç, 2022). Several studies shown that there is a significant relationship between high academic pressure and the occurrence of gastritis in students (Mohapatro et al., 2024; Tulyani, 2024; Wu et al., 2022); academic stress factors and lack of sleep can also affect the occurrence of gastritis in students (Mehmadi et al., 2023). Poor sleep quality causes increased gastrointestinal issues; excessive secretion of proinflammatory cytokines in sleep disorders causes the gastric mucosa to become easily damaged (Baranwal et al., 2023; Godos et al., 2021; Nakamura et al., 2021).

Although many studies have discussed the risk factors for gastritis, most of the existing studies are still general and have not explicitly examined nursing students as the research population. Nursing students have higher levels of academic stress compared to students from other majors due to heavy academic loads, clinical practice, and early professional demands. Nursing students have complex academic load characteristics: they must adhere to a busy lecture schedule, engage in clinical practice, and face emotional pressure from professional demands from an early age. This situation makes nursing students a group that is very vulnerable to chronic academic stress, which contributes to the occurrence of gastrointestinal disorders such as gastritis. In fact, nursing students have different backgrounds of activities, academic pressure, and psychological conditions compared to students from other majors, so the risk factors can be more complex and specific. In addition, in Indonesia, there is still limited quantitative research that explicitly analyzes the dominant risk factors that cause gastritis in nursing students, especially with a multivariate statistical approach that can identify the most contributing risk factors. Based on the description above, this study aims to analyze the dominant risk factors that contribute to the occurrence of gastritis in nursing students. The main focus of this study is

to determine whether diet, sleep quality, or stress levels are more influential than other factors in triggering gastritis. The results of this study are expected to serve as the basis for developing more effective prevention strategies for students to improve their quality of life and health.

METHOD

Research design and participant characteristics

This study employed an observational analytic design with a cross-sectional approach to determine the dominant risk factors contributing to gastritis among nursing students. The study population was consisted of all active nursing students enrolled at the University of Muhammadiyah Malang in the 3rd year of 2024 at Malang city, east Java, Indonesia. Participants totaling 107 respondents were selected using a purposive sampling technique that met the inclusion criteria: (1) active nursing students, (2) have a history of gastritis, and (3) are willing to participate by signing informed consent; Exclusion criteria: 1) Students with a history of chronic diseases that affect the digestive system (e.g., Crohn's disease, celiac, etc.), 2) Currently undergoing regular drug treatment. Data collection was carried out from November to December 2023.

Instruments

This study uses valid and reliable instruments, namely:

1) The Dietary Pattern Questionnaire developed by Rodliya (2022) was used to assess the frequency, quantity, and types of food consumed. This instrument consists of 16 items measured on a four-point Likert scale, including five items on meal frequency, four items on portion size, and nine items on types of food consumed. Each item is rated using the following scoring system: 1 = never, 2 = sometimes (1 time/week), 3 = often (2–3 times/week), and 4 = very often (>4 times/week). Respondents whose total score was below the mean cut-off point were categorized as having a good dietary pattern, while those with scores above the cut-off point were categorized as having a poor dietary pattern.
2) Pittsburgh Sleep Quality Index (PSQI) to Measure sleep quality in seven components. This is a 19-item test and consists of seven components: (1) subjective sleep quality, (2) sleep latency, (3) sleep duration, (4) sleep efficiency, (5) sleep disturbances, (6) use of sleeping medication and (7) daytime dysfunction. Each component is scored from 0 to 3, and the total score ranges from 0 to 21, with lower scores (<5) indicating good sleep quality. The PSQI has adequate internal consistency (Cronbach's alpha = 0.73).
3) Depression, Anxiety, and Stress Scale (DASS) to Measure stress levels utilizing a 14-questions indicator, specially the DASS-14, Each evaluation component is measured by the DASS-14 questionnaire using 4 rating scales, 0 indicating inappropriate, 1 indicating sometimes, 2 indicating quite often, and 3 indicating very similar or almost always. The assessment indicators are normal = 0-14, mild = 15-18, moderate = 19-25, severe = 26-33, very severe = >34. The researcher used the DASS-42 questionnaire sheet which had been adapted into 14 questions. This instrument has undergone validity and reliability testing by Sumiati Petronella Br Sitinjak (2021) which shows evidence that this instrument can be considered a reliable tool to help understand the psychological components of humans. From the results of the validity test, 30 valid statements were found out of 30 statements that were tested valid with a calculated r value> r table with a fixed r table = 0.361. Conbrach's Alpha = 0.911 still shows that the results are valid and reliable.
4) Gastritis Symptom Questionnaire (GSQ) was used to assess symptoms associated with gastritis. This instrument consists of 15 items measured on Likert scale, including 7 items on general gastritis symptoms, 3 items on symptoms triggered by specific food, and 5 items on symptoms related to eating habits. Each item is rated using a-4 points scale: 1 point = never, 2 points = sometimes (1x/week), 3 points = often (2-3x/week), 4 points = very often (>4x/week). A total the respondent's

score below the cut-off point indicates no symptoms of gastritis; while a score above the cut-off point indicates the presence of gastritis symptoms. This instrument has undergone validity and reliability testing and was declared valid and reliable for use in measuring gastritis-related symptoms (Rodliya, 2022).

Data Collection Procedure

Data were collected through online questionnaires distributed via Google Forms. Respondents completed questionnaires on dietary patterns, the Pittsburgh Sleep Quality Index (PSQI), the Depression Anxiety Stress Scales (DASS), and gastritis symptoms. Ethical clearance was obtained, and informed consent was ensured prior to data collection. This study has obtained ethical approval from the Health Research Ethics Committee (KEPK) of the Faculty of Medicine, University of Muhammadiyah Malang, with the number: No.E.5.a/320/KEPKUMM/X/2023, dated October 30, 2023, and valid until October 30, 2024. The evaluation of ethical feasibility refers to the 7 WHO Standards 2011 and CIOMS Guidelines 2016, including social values, scientific values, insurance equity and benefits, informed consent, confidentiality, and respondents. All respondents have given written consent before participating in the study.

Data Analysis

Descriptive statistics were used to summarize respondent characteristics, dietary patterns, sleep quality, and stress levels. Chi-square tests were employed to examine bivariate relationships between independent variables (dietary patterns, sleep quality, and stress) and gastritis occurrence. Multivariate logistic regression was conducted to identify the dominant risk factor. Data analysis was performed using SPSS version 23, with a significance level set at $p < 0.05$.

RESULTS

Respondent Characteristics

The respondents are predominantly young adults, with a relatively homogeneous age distribution, as indicated by the small standard deviation (0.75). This suggests that most respondents are close in age to the mean (21.4 years), with minimal variation, see table 1.

The majority (59.8%) of respondents have experienced gastritis symptoms for less than a year, indicating a high prevalence of newly developed or acute cases. The sample is mostly female (86%), which could mean that women are more likely to report gastritis symptoms or that the study population has a higher percentage of female respondents. The medical diagnosis of digestive disorder in more than half of respondents (55.1%) confirms the prevalence of gastritis-related conditions in this group. Most respondents (80.4%) do not have any additional health conditions, while 19.6% report having other illnesses, which could contribute to their gastritis symptoms. Among the 19.6% of respondents with additional health conditions, the most common are allergies and typhoid (each at 2.8%). Other conditions, such as hypertension, bronchitis, and acid reflux, are present but at lower rates. The presence of these conditions may influence the symptoms of gastritis or overall health status.

Analysis of Independent and Dependent Variables

In this study, various independent variables, including eating patterns, sleep quality, and stress levels, were analyzed to determine their potential influence on the dependent variable, gastritis symptoms. These factors are known to play a crucial role in gastrointestinal health, particularly in the development and progression of gastritis.

The majority of respondents (52.3%) have poor eating habits. A significant majority (90.7%) of respondents experience poor sleep quality. Most respondents (73.8%) report no stress. The distribution of respondents with and without gastritis is almost equal, with 50.5% not experiencing gastritis and 49.5% diagnosed with gastritis, see Table 2.

Table 1. Demographic Data of Nursing Students with Gastritis

Demographic Data	Characteristic	Frequency (f)	Percentage (%)
Age	Mean: 21.4	Min – Max: 19 – 24	StDev: 0.75
Duration of Gastritis Symptoms	< 1 year	64	59.8
	1 – 2 years	21	19.6
	> 3 years	22	20.6
Gender	Male	15	14
	Female	92	86
Medical Diagnosis of Digestive Disorders (Gastritis/Acid Reflux)	No	48	44.9
	Yes	59	55.1
History of Other Diseases	No other illnesses	86	80.4
	Has other illnesses	21	19.6
	- Allergy	3	2.8
	- Typhoid	3	2.8
	- Hypertension	2	1.9
	- Bronchitis	2	1.9
	- Acid Reflux	2	1.9
	- Typhoid & Dengue Fever	1	0.9
	- Hypotension	1	0.9
	- Asthma	1	0.9
	- Asthma & Sinusitis	1	0.9
	- Anemia	1	0.9
	- Seizures & Diabetes	1	0.9
	- Migraine	1	0.9
	- Other illnesses	2	1.9

Table 2. Distribution of Eating Patterns, Sleep Quality, Stress Levels, and Gastritis Symptom

Variables	Category	Frequency (f)	Percentage (%)
Eating Patterns	Poor	56	52.3
	Good	51	47.7
Sleep Quality	Poor	97	90.7
	Good	10	9.3
Stress Levels	No stress	79	73.8
	Stressed	28	26.2
Gastritis Symptoms	No Gastritis	54	50.5
	Gastritis	53	49.5
Total		107	100

Analysis of the Relationship Between eating patterns, sleep quality, stress levels and Gastritis Incidence

To determine the relationship between eating patterns, sleep quality, and stress levels with gastritis incidence, statistical analysis was conducted using the Chi-Square test, and the results are presented in the following tables 3.

Table 3. Relationship between Eating Patterns, Sleep Quality, Stress Levels, and Gastritis Symptom

		Gastritis Incidence		Total	P-Value
		No gastritis	Gastritis		
Eating Patterns	Poor	20	36	56	0.001
	Good	34	17	51	
Sleep Quality	Poor	46	51	97	0,050
	Good	8	2	10	
Stress Levels	No Stress	51	28	79	0.0001
	Stressed	3	25	28	
Total		54	53	107	

Based on table 3, it is known that the highest incidence is poor diet experiencing gastritis as many as 36 out of 56 respondents (64.3%), on the other hand, respondents with good diet mostly did not experience gastritis as many as 34 out of 51 respondents (66.7%). p-value is 0.001 which means the p-value <α so that the conclusion of the H_0 hypothesis is rejected, then it can be interpreted that there is a significant relationship between diet and the incidence of gastritis. Students with a poor diet are more likely to experience gastritis compared to students who have a good diet.

The majority of respondents with poor sleep quality experienced gastritis as many as 51 out of 97 respondents (52.6%) on the other hand, respondents with good sleep quality mostly did not experience gastritis as many as 8 out of 10 respondents (80%). It is known that the p-value is 0.050 which means p-value = α so it is concluded that the relationship between sleep quality and the incidence of gastritis is at the significant threshold (p = 0.05). Students with poor sleep quality tend to experience gastritis more often than students who have good sleep quality.

Among stressed respondents, 25 out of 28 (89.3%) experienced gastritis, The p-value 0.0001 indicates a highly significant relationship between stress levels and gastritis incidence. This strongly suggests that high stress levels are a major risk factor for gastritis, highlighting the importance of stress management in preventing gastrointestinal issues.

Analysis of dominant causal factors for gastritis in nursing students

The multivariate analysis used to identify the most dominant factors influencing the incidence of gastritis is logistic regression. The results are as in Table 4.

Table 4. Regression logistic analysis

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Eating Patterns	0.911	0.457	3.971	1	0.046	2.486
Sleep Quality	0.644	0.849	0.576	1	0.448	1.904
Stress Levels	2.466	0.668	13.623	1	0.000	11.780
Constant	-5.629	1.774	10.069	1	0.002	0.004

The results indicate that dietary patterns have a significant influence on the likelihood of gastritis (p = 0.046). The odds ratio (Exp(B) = 2.486) suggests that individuals with poor dietary habits are 2.49 times more likely to develop gastritis compared to those with healthy eating patterns. Although poor sleep quality was associated with a slightly higher likelihood of gastritis (Exp(B) = 1.904), the p-value (0.448) indicates that this factor was not statistically significant in this model. This finding suggests that, within this study sample, sleep disturbances alone are not a strong predictor of gastritis. Stress level emerged as the strongest and most significant predictor of gastritis (p = 0.000). The odds ratio (Exp(B) = 11.780) indicates that those who were stressed were nearly 12 times more likely to develop gastritis compared to those who were not stressed. This substantial increase in risk reinforces previous evidence linking psychological stress to gastric mucosal disturbance and gastritis incidence.

Based on regression analysis, it can be concluded that the stress level is the most dominant factor influencing the occurrence of gastritis among nursing students, as indicated by the highest odds ratio (11,780) and strong statistical significance (p = 0.000). Dietary pattern also demonstrated a significant association with gastritis (p = 0.046; OR=2,486). In contrast, sleep quality did not show a statistically significant effect (p = 0.448) in this model.

DISCUSSION

The multivariate analysis found that stress levels were the dominant factor contributing to the incidence of gastritis, followed by poor dietary patterns. Meanwhile, sleep quality did not show a significant relationship with gastritis. These findings indicate that efforts to prevent gastritis should primarily focus on stress management and dietary improvements, such as establishing a regular eating schedule and consuming a balanced, nutritious diet. This result supports the findings of Feyisa & Woldeamanuel (2021), who concluded that stress is the primary risk factor for gastritis among university students.

The Physiological Mechanisms of Stress in Gastritis

From a physiological perspective, stress plays a significant role in the pathogenesis of gastritis through several key mechanisms. First, stress triggers increased gastric acid secretion by activating the sympathetic nervous system and the hypothalamic-pituitary-adrenal (HPA) axis. This leads to an overproduction of cortisol and adrenaline, both stimulating excessive gastric acid secretion. If food intake does not neutralize this acid, it can irritate the gastric mucosa, leading to inflammation (Li, 2024; Rugge et al., 2021). Second, stress impairs the protective function of the gastric mucosa. Usually, the stomach lining is safeguarded by mucus and prostaglandins, which help maintain its integrity against acidic exposure. However, stress has been shown to inhibit prostaglandin production, making the gastric mucosa more susceptible to damage (Lanas & Chan, 2017). Third, chronic stress increases systemic inflammation, contributing to gastric mucosal injury. Stress stimulates the release of pro-inflammatory cytokines such as IL-6, TNF-α, and CRP, all of which accelerate the breakdown of the gastric lining (Chen et al., 2023; Collatuzzo et al., 2022). Lastly, stress disrupts gastrointestinal motility, leading to delayed gastric emptying and an increased risk of gastroesophageal reflux disease (GERD) and chronic gastritis. Activation of the sympathetic nervous system due to stress can slow digestion and increase gastric acid retention, further exacerbating gastric irritation (Kim et al., 2021).

These findings are consistent with studies by Silwal et al. (2021), which reported that students experiencing severe stress were 2.8 times more likely to develop gastritis compared to those with low-stress levels. Similarly, Mehmadi et al. (2023) found that high academic stress increases the risk of digestive disorders by up to 30% compared to individuals with lower stress levels.

The Role of Poor Dietary Patterns in Gastritis

Apart from stress, poor dietary habits were also identified as a significant factor contributing to gastritis. However, it is important to note that poor eating habits are often closely linked to high-stress levels. University students, especially those under high academic pressure, often develop irregular eating patterns, such as skipping meals, consuming fast food, or relying on caffeine and sugary foods to cope with stress (Rodliya, 2022).

Research by Dakanalis et al. (2023) found that individuals experiencing high stress are more likely to consume high-fat, spicy, and caffeinated foods, all of which have been shown to trigger excessive gastric acid secretion and aggravate gastritis symptoms. Furthermore, (Elseweidy, 2017) explained that stress-induced changes in gastrointestinal motility could delay gastric emptying, causing prolonged acid exposure in the stomach, thereby increasing the risk of gastric irritation and chronic gastritis.

The Non-Significant Relationship Between Sleep Quality and Gastritis

Although previous studies have suggested that poor sleep quality may worsen gastritis, the present study did not find a significant relationship between sleep quality and gastritis (p = 0.448). Several

possible explanations may account for this finding. First, it is possible that more dominant factors, such as stress and diet, overshadowed the effects of sleep quality. While poor sleep has been linked to increased gastric acid secretion, psychological stress and dietary habits may have a more decisive direct influence on gastritis incidence in this population. Second, some individuals may have adapted to poor sleep quality over time, meaning that its effects on gastric health may not be as pronounced as those of stress and diet. Third, the distinction between sleep duration and quality may play a role in these findings. Some studies have reported that short sleep duration is associated with a higher risk of gastritis, whereas poor sleep quality alone may not be a decisive, independent risk factor (Cantay & Büyüksandalyacı Tunç, 2022).

Rugge et al. (2020b) also indicated that sleep quality impacts gastritis more in older populations than in young adults, which may explain why no significant association was found in this study among university students.

Clinical Implications and Preventive Strategies

Based on these findings, several recommendations can be proposed to prevent and manage gastritis among nursing students. First, stress management interventions should be integrated into academic environments. Programs such as psychological counseling, mindfulness training, and relaxation techniques could help students cope with academic stress more effectively. Second, promoting healthy dietary habits is crucial. University students should be educated on the harmful effects of irregular eating patterns and unhealthy food choices on gastric health, and strategies to maintain a balanced diet should be encouraged. Third, time management training should be provided to help students organize their academic workload more efficiently, reducing the need for late-night studying, meal skipping, and excessive caffeine consumption. Lastly, raising awareness about gastrointestinal health should be prioritized. Educational campaigns emphasizing the importance of regular meals, adequate sleep, and stress reduction techniques could help minimize gastritis risk and improve students' overall well-being

However, the study has several limitations. First, its cross-sectional design does not allow causal relationships to be established . Second, the use of self-reported questionnaires may have introduced recall bias and social desirability bias, potentially underestimating the true association. Third, gastritis symptoms were not clinically confirmed, which may lead to misclassification bias. Additionally, some potential confounding variables such as Helicobacter pylori infection, caffeine intake, or NSAID use were not measured. These factors may influence the observed relationships and should be considered in future research.

CONCLUSION

This study confirms that stress levels are the dominant factor causing gastritis in nursing students, with poor diet as a contributing factor. Therefore, the most effective preventive strategies are stress management interventions and healthy diet education, which can help students reduce the risk of gastritis and improve academic well-being and overall health.

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AUTHOR CONTRIBUTION

FR designed and developed the study, supervised the research process, performed data analysis, interpreted the results, conducted the discussion, and drafted the manuscript. DDSR, NHA, STSM handled the study administration, obtained permits, performed data collection, and data entry. CHA, AINR, and ZU conducted the literature review, methodology, statistical consultation, and critical revision of the manuscript. S contributed to study supervision, validation of the results, and final review of the manuscript. All authors read and approved the final manuscript.

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ETHICAL STATEMENT

This study has received ethical approval from the Health Research Ethics Committee of the Faculty of Medicine, University of Muhammadiyah Malang, with number: No.E.5.a/320/KEPKUMM/X/2023.

DATA AVAILABILITY STATEMENT

The data supporting this research are available from the corresponding author upon reasonable request. For privacy and ethical reasons, the respondents' identifying information will not be made public.

CONFLICT OF INTEREST

The author declares that this research has no conflict of interest.

REFERENCES

Ahmed Ghanem, G., Ahmed Bedier, D., Gehan Mohamed Desoky, A., Ibrahim Abdelkader, A., & Professor, A. (2019). Assessment of lifestyle of patients with chronic gastritis. *International Journal of Novel Research in Healthcare and Nursing*, *6*(3), 203–213. www.noveltyjournals.com

Badan Kebijakan Pembangunan Kesehatan KEMENKES RI. (2023). *Survei Kesehatan Indonesia Tahun 2023*. BPKKP KEMENKES.

Baranwal, N., Yu, P. K., & Siegel, N. S. (2023). Sleep physiology, pathophysiology, and sleep hygiene. *Progress in Cardiovascular Diseases*, *77*, 59–69. https://doi.org/10.1016/j.pcad.2023.02.005

Cantay, H., & Büyüksandalyacı Tunç, E. (2022). Association of Gastritis with Sleep and Quality of Life: A Hospital-based Cross-sectional Study. *Journal of Turkish Sleep Medicine*, *9*(3), 263–268. https://doi.org/10.4274/jtsm.galenos.2022.59244

Chen, B., Dong, X., Zhang, J., Wang, W., Song, Y., Sun, X., Zhao, K., & Sun, Z. (2023). Effects of oxidative stress regulation in inflammation-associated gastric cancer progression treated using traditional Chinese medicines: A review. *Medicine*, *102*(46), e36157. https://doi.org/10.1097/MD.0000000000036157

Chinese Society of Gastroenterology. (2023). Guidelines for diagnosis and treatment of chronic gastritis in China (2022, Shanghai). *Journal of Digestive Diseases*, *24*(3), 150–180. https://doi.org/10.1111/1751-2980.13193

Collatuzzo, G., Alicandro, G., Bertuccio, P., Pelucchi, C., Bonzi, R., Palli, D., Ferraroni, M., Ye, W., Plymoth, A., Zaridze, D., Maximovich, D., Aragones, N., Castaño-Vinyals, G., Vioque, J., Garcia

de la Hera, M., Zhang, Z.-F., Hu, J., Lopez-Carrillo, L., López-Cervantes, M., … Boffetta, P. (2022). Peptic ulcer as mediator of the association between risk of gastric cancer and socioeconomic status, tobacco smoking, alcohol drinking and salt intake. *Journal of Epidemiology and Community Health*, *76*(10), 861–866. https://doi.org/10.1136/jech-2022-219074

Dakanalis, A., Mentzelou, M., Papadopoulou, S. K., Papandreou, D., Spanoudaki, M., Vasios, G. K., Pavlidou, E., Mantzorou, M., & Giaginis, C. (2023). The Association of Emotional Eating with Overweight/Obesity, Depression, Anxiety/Stress, and Dietary Patterns: A Review of the Current Clinical Evidence. *Nutrients*, *15*(5), 1173. https://doi.org/10.3390/nu15051173

Elseweidy, M. M. (2017). Brief Review on the Causes, Diagnosis and Therapeutic Treatment of Gastritis Disease. *Alternative & Integrative Medicine*, *06*(01). https://doi.org/10.4172/2327-5162.1000231

Feyisa, Z. T., & Woldeamanuel, B. T. (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. https://doi.org/10.1371/journal.pone.0246619

Godos, J., Grosso, G., Castellano, S., Galvano, F., Caraci, F., & Ferri, R. (2021). Association between diet and sleep quality: A systematic review. *Sleep Medicine Reviews*, *57*, 101430. https://doi.org/10.1016/j.smrv.2021.101430

Jusuf, H., Adityaningrum, A., Yunus, R., Olahraga, F., Kesehatan, D., & Gorontalo, U. N. (2022). Determinan Kejadian Gastritis Pada Mahasiswa The Determinants of Gastritis Among Students. *Jambura Health and Sport Journal*, *4*(2). https://ejurnal.ung.ac.id/index.php/jhsj/article/view/15171

Kim, H., Lim, Y., Seo, S., Lee, K., Kim, J., & Shin, W. (2021). A deep recurrent neural network-based explainable prediction model for progression from atrophic gastritis to gastric cancer. *Applied Sciences (Switzerland)*, *11*(13). https://doi.org/10.3390/app11136194

Lanas, A., & Chan, F. K. L. (2017). Peptic ulcer disease. *The Lancet*, *390*(10094), 613–624. https://doi.org/10.1016/S0140-6736(16)32404-7

Li, A. (2024). Progress of Research on the Effect of Dietary Care on Patients with Gastritis and Gastric Ulcers. *Journal of Clinical and Nursing Research*, *8*(2). http://ojs.bbwpublisher.com/index.php/JCNR

Mehmadi, B., Alomran, N., AlSulaiman, S., AlMutairi, J., & AlZahrani, H. (2023). Knowledge and Practice Regarding Risk Factors for Peptic Ulcer Disease in Saudi Arabia's Adult Population. *Journal of Complementary Medicine Research*, *14*(3), 10. https://doi.org/10.5455/jcmr.2023.14.03.03

Mohapatro, M. P., Ritarani Nayak, M., Swain, M. M., Kabita Puhan, M., Khosla, M. P., & Pradhan, M. I. (2024). Knowledge Assessment of Gastritis-Related Factors Among University Students of Bhubaneswar, Odisha. *Obstetrics & Gynaecology Forum 2024*, *34*(3s), 2360–2364. https://www.obstetricsandgynaecologyforum.com/index.php/ogf/article/view/707

Nakamura, F., Kuribayashi, S., Tanaka, F., Kawami, N., Fujiwara, Y., Iwakiri, K., Kusano, M., & Uraoka, T. (2021). Impact of improvement of sleep disturbance on symptoms and quality of life in patients with functional dyspepsia. *BMC Gastroenterology*, *21*(1), 78. https://doi.org/10.1186/s12876-021-01659-y

Osyodlo, G. V., Kotyk, Y. Y., Kalashnikov, M. A., & Osyodlo, V. V. (2021). Prevalence, clinical course and treatment of chronic gastritis at the present stage. *GASTROENTEROLOGY*, *55*(2), 74–80. https://doi.org/10.22141/2308-2097.55.2.2021.233627

Rodliya, H. F. (2022). *Hubungan Pola Makan dan Stres Dengan Gejala Gastritis Pada Remaja di MA Ibnul Qoyyim Putri Sleman*. UIN Walisongo. https://eprints.walisongo.ac.id/id/eprint/19249

Romanda, E. V. (2019). Analisis Faktor Dominan yang Berhubungan dengan Gastritis pada Mahasiswa Fakultas Keperawatan UNiversitas Airlangga [Universitas Airlangga]. In *Perpustakaan Airlangga*. https://repository.unair.ac.id/84833/

Rugge, M., Savarino, E., Sbaraglia, M., Bricca, L., & Malfertheiner, P. (2021). Gastritis: The clinico-pathological spectrum. In *Digestive and Liver Disease* (Vol. 53, Issue 10, pp. 1237–1246). Elsevier B.V. https://doi.org/10.1016/j.dld.2021.03.007

Rugge, M., Sugano, K., Sacchi, D., Sbaraglia, M., & Malfertheiner, P. (2020a). Gastritis: An Update in 2020. *Current Treatment Options in Gastroenterology*, *18*(3), 488–503. https://doi.org/10.1007/s11938-020-00298-8

Rugge, M., Sugano, K., Sacchi, D., Sbaraglia, M., & Malfertheiner, P. (2020b). Gastritis: An Update in 2020. *Current Treatment Options in Gastroenterology*, *18*(3), 488–503. https://doi.org/10.1007/s11938-020-00298-8

Safii, M., & Andriani, D. (2019). Faktor–Faktor Yang Berhubungan Dengan Kejadian Gastritis Pada Pasien Yang Berobat di Puskesmas. *Jurnal Keperawatan & Fisioterapi (JKF)*, *2*(1), 52–60. https://doi.org/10.35451/jkf.v2i1.281

Silwal, S., Acharya, A., Baral, B., Devkota, A., Subedee, A., & Paudel, U. (2021). Knowledge Regarding Gastritis among Late Adolescence in Central Nepal. *Marsyangdi Journal*, *II*, 81–93. https://doi.org/10.3126/mj.v2i1.39967

Tulyani, K. (2024). Health Promotion Analysis on Gastritis: Students' Knowledge and Attitudes Towards Students' Health. *Journal of Health Innovation and Environmental Education*, *1*(1), 26–31. https://doi.org/10.37251/jhiee.v1i1.1026

Turnip, E. D. ., Indriarini, M. Y., & Wijaya, Y. M. (2023). Unhealthy Lifestyle Among Sufferers Of Gastritis On Young Adult Age. *Jurnal Berita Ilmu Keperawatan*, *16*(2), 232–239. https://doi.org/10.23917/bik.v16i2.2346

Umasugi, M. T., Soulissa, F. F., Susanti, I., & Latuperissa, G. R. (2020). The Effect of Health Education on Gastritis Prevention Behavior Among High School Students. *Jurnal Ners*, *15*(2 Special Issue), 476–479. https://doi.org/10.20473/jn.v15i2(si).20515

WHO. (2020). *Updated WHO recommendations for international traffic in relation to COVID-19 outbreak*. https://www.who.int/news-room/articles-detail/updated-who-recommendations-for-international-traffic-in-relation-to-covid-19-outbreak/

Wu, H., Liang, G., Kong, M., Zhang, Y., Zhou, Y., Han, J., Hu, X., Li, Y., Li, Y., Zhan, Q., Chen, S., Du, Y., & Chen, W. (2022). The status and risk factors for anxiety/depression in patients with atrophic chronic gastritis: a cross-sectional study. *Annals of Palliative Medicine*, *11*(10), 3147–3159. https://doi.org/10.21037/apm-22-730