DETERMINANTS OF PEPTIC ULCER DISEASE INCIDENCE IN PANGA SUB-DISTRICT, ACEH JAYA DISTRICT

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Abstract

Peptic ulcer is one of the health problems in the community with a high prevalence. According to WHO in 2019 the incidence of gastric ulcers in the world reached 1.8 million to 2.1 million people each year. From the results of an initial survey conducted in the community of Panga sub-district, Aceh Jaya district. out of 10 people who had been interviewed, 8 people stated that they experienced gastric ulcers such as pain in the stomach. Research was conducted to determine the determinants of the incidence of gastric ulcers. This type of research is descriptive analytic with a cross sectional study approach. The independent variables are diet, coffee consumption, sleep patterns, stress levels, while the dependent variable is the incidence of gastric ulcers. The research was conducted in 2023. The population in the study was the community of panga sub-district, aceh jaya district as many as 156 people, while the sample was 112 students. The sampling technique used in the study was random sampling. The results of this study showed that diet and coffee consumption had a significant relationship with the incidence of peptic ulcers, while sleep patterns and stress levels had no significant effect. Regular coffee consumption can reduce the risk of peptic ulcer in the community of Panga District, Aceh Jaya Regency.

Keywords: *Determinants, Peptic Ulcer, Community*

1. INTRODUCTION

The stomach is one of the human digestive organs that functions to digest food with the help of stomach acid and pepsin (Hall, 2021). The stomach is protected by the mucous layer, but due to several irritant factors such as food, drinks and Non Steroid Anti-Inflammatory Drug (NSAID) drugs and alcohol can cause damage to the mucosal layer resulting in acute / chronic gastritis or gastric ulcers. Gastric ulcer is a condition of discontinuity of mucosal continuity that extends under the epithelium or damage to the mucosal tissue, submucosa to the muscle layer of a region of the gastrointestinal tract that is directly related to acidic gastric juice / pepsin (Obafemi et al., 2021). Every year 4 million people suffer from peptic ulcers worldwide, about 10%-20% have complications and as many as 2%-14% have perforated peptic ulcers.

Peptic ulcer perforations are relatively minor but can be life threatening with mortality rates varying from 10%-40%. More than half of the cases are female and usually affect the elderly who have more risk of comorbidities than men. The main causes are the use of Non-Steroidal Anti-Inflammatory Drugs (NSAIDs), steroids, smoking, and Helicobacter pylori (Saverio et al., 2014). Peptic ulcer is a disease of the gastrointestinal tract caused by gastric acid and pepsi that are secreted excessively by the gastric mucosa (Saputri et al., 2014).

According to research in Indonesia, the incidence of Helicobacter Pylori bacteria increased in 2018 from 11,592 diagnoses to 97,823 diagnoses in 2019. Peptic ulcer

disease has a high level of seriousness in the world of health. Based on this, research was conducted to find out the picture in the people of Aceh Jaya (Samiasih, 2023). Gastric ulcer is the formation of ulcers / wounds in the upper digestive tract caused by the formation of acid and pepsin (Roberts et al., 2014). Ulcers are different from mucosal erosion or better known as gastritis which makes the wound deeper reaching the muscularis mucosa or stomach lining. The causes of gastric ulcers are ulcers caused by Hellicobacter Pylori, NSAIDs (Non Steroidal Anti-Inflammatory Drugs) and SRMD (Stress Related Mucosal Demage). Based on the above background, this study aims to determine the determinants of the incidence of peptic ulcer disease in Panga District, Aceh Jaya Regency.

2. RESEARCH METHODS

This type of research is descriptive analytic with a cross sectional study approach. The independent variables in this study were diet, coffee consumption, sleep patterns, stress levels, while the dependent variable was the incidence of gastritis, which was measured at the same time (Firdausy et al., 2022). The population in this study was the community of Panga sub-district, Aceh Jaya Regency, totaling 156 people. The sample in this study was obtained using the slovin formula, which was 112 people. The slovin formula used is as follows:

$$n = \frac{\mathrm{N}}{1 + \mathrm{Ne}^2}$$

Where n is the sample size, N is the population size, and e is the margin of error. The sampling technique used in this study is random sampling, which is a sampling technique where each population has the opportunity to be sampled and all possible samples have the same opportunity to be selected as samples (West, 2016).

This study uses instruments in the form of questionnaires, where the data used is data obtained from direct interviews conducted in the study to respondents with questionnaire guides, Depression Anxiety Stress Scale (DASS), Pittsburgh Sleep Quality Index (PSQI), coffee consumption, gastritis incidence that has been prepared. Data analysis techniques used, namely univariate analysis (to determine the description of the characteristics of each research variable), bivariate analysis, and multivariate analysis. Bivariate analysis used the Chi-Square test. This test is generally used to compare the distribution of categorical variables to a distribution or hypothesis test where 2 categorical variables have no significant relationship or are independent (Schober & Vetter, 2019). In general, the equation is as follows (Rana & Singhal, 2015)

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

Multivariate analysis used logistic regression analysis. Logistic regression is a prediction model to evaluate the influence between the dependent variable and the independent variable, where the dependent variable is categorical data (Ciu & Oetama, 2020). To test the hypothesis in logistic regression analysis, the Wald test is used. In general, the equation is as follows (Al_Bairmani & Ismael, 2021).

3. RESULTS AND DISCUSSION

3.1. Research Result

Based on the research conducted, the results of univariate analysis in the form of respondent characteristics are presented in Table 1 below.

Table 1. Respondent Characteristics

Respondent Characteristics	Total	
	n	%
Gender		
Male	14	12,5
Female	98	87,5
Age (years)		
20	4	3,6
21	70	62,5
22	37	33,0
23	1	0.9
Diet		
Irregular	66	58,9
Regular	46	41,1
Coffee Consumption		
Regular	32	28,6
Not Regular	80	71,4
Sleep Pattern		
Not Good	74	66,1
Enough	31	27,7
Good	7	6,2
Stress Level		
Very severe	3	2,7
Severe	19	17,0
Moderate	24	21,4
Mild	25	22,3
Normal	41	36.6
Gastritis Occurrence		
Experienced gastritis incidence	63	56,2
Not experiencing gastritis	49	43,8

Source: Primary Data, 2024

Based on the results of univariate analysis in the table, it is known that the most dominant respondents in the study were respondents with female gender totaling 98 people (87.5%), respondents with age 21 years totaling 70 people (62.5%), respondents with irregular diets totaling 66 people (58.9%), respondents who did not usually consume coffee totaling 80 people (71.4%), respondents with poor sleep patterns totaling 74 people

(66.1%), respondents with normal stress levels totaling 41 people (36.6%), and respondents with gastritis events totaling 63 respondents (56.2%).

Table 2. Determinants of Peptic Ulcer Incidence

Research variables	B	S.E	Wald	df	*p-value*	Exp (B)
Diet (1)	3.169	0.607	27.267	1	0.000*	23.774
Coffee Consumption (1)	-1.385	0.592	5.471	1	0.019*	0.250
Sleep Pattern (1)	0.619	1.061	0.340	1	0.560	1.857
Sleep Pattern (2)	-1.742	1.033	2.846	1	0.092	0.175
Stress Level (1)	-0.569	0.765	0.553	1	0.457	0.566
Stress Level (2)	-1.190	0.762	2.440	1	0.118	0.304
Stress Level (3)	-2.439	0.952	6.563	1	0.010	0.087
Stress Level (4)	21.029	2.162e4	0.000	1	0.999	1.358e9
Constant	0.300	1.049	0.082	1	0.775	1.349

Source: Primary Data, 2024

From the results of the logistic regression analysis of the influence of the determinants of incidence in the table shows that sleep patterns and stress levels have a p-value = a (0.05) so that it fails to reject H0, which means that these two variables do not significantly affect the incidence of gastric ulcers in the community. While diet and coffee consumption have a value, so reject H0, which means that both variables have a significant effect on the incidence of peptic ulcers in the community of Panga District, Aceh Jaya Regency.

Table 3. Bivariate Analysis Variable Category P-value

Predisposing factor		
Education	High Low	0,000
Knowledge	High Low	0,000
Attitude	Positive Negative	0,000
Enabling Factors		
Food	Own Do not have	0,000
Drink	Available None	0,000
Amplifying Factor		
Community socialization	Available None	0,000
Family Environment	Available None	0,008

Source: Primary Data, 2024

Based on the results of bivariate analysis, it is known that all independent variables studied are related to family behavior towards peptic ulcers. Each of these variables can be explained in Table 3.

3.1.1. Multivariate Analysis

Table 4. Results of Multivariate Analysis of Variables

OR95 %	CI	P	*Value*
Food and Drink	17,383	0,188 – 1610,137	0,217
Maternal knowledge	1,690	0,505 – 5,614	0,392
Family Attitude	8,457	3,180 – 22,487	0,000
Nutrition Awareness	27,036	5,224 – 139,912	0,000
Clean water facilities	7,539	2,365 – 24,037	0,001
Officer guidance	4,480	1,408 – 14,254	0,011
Official support	2,783	1,154 – 6,714	0,023

Source: Primary Data, 2024

The results of multivariate analysis showed that there were five variables associated with family behavior towards peptic ulcer, namely family attitude towards the health of food and beverages consumed, nutritional awareness of peptic ulcer, availability of clean water facilities, socialization of peptic ulcer by health center officers, and support from village officials, posyandu cadres and NGOs. Of the five variables, the dominant factor associated with family behavior towards the use of peptic ulcer is the variable of peptic ulcer nutrition awareness with OR = 27, meaning that families who have peptic ulcer will have a 27 times chance of using peptic ulcer compared to families who do not have peptic ulcer. Meanwhile, food and beverages and maternal knowledge about peptic ulcer are confounder variables.

Multivariate analysis showed that maternal education and knowledge were not significantly associated with family behavior towards peptic ulcer (p value 0.217 and 0.292). Variables that were significantly associated with family behavior toward peptic ulcer were family attitude (p value = 0.000; OR = 8.5; 95% CI OR = 3.18-22.49); peptic ulcer nutrition awareness (p value = 0.000; OR = 27.04; 95% CI OR = 5.24 -139, 91); clean water facilities (p value = 0.001; OR = 7.54; 95% CI OR = 2.36 - 24.04); officer coaching (p value = 0.011; OR = 4.48; 95% CI OR = 1.41-14.25); official support (p value = 0.023; OR = 2.7; 95% CI OR = 1.15-6.71). (See Table 4).

3.1.2. Univariate Analysis

The univariate test results show several variables that have a significant relationship with family behavior towards peptic ulcers. First, family attitude has a very low p value of 0.000, indicating that there is a strong relationship between family attitude and behavior towards peptic ulcers. The Odds Ratio of 8.5 indicates that the likelihood of family behavior supporting peptic ulcers increases by 8.5 times if family attitudes are supportive.

Second, nutritional awareness of peptic ulcer also has a low p value of 0.000, indicating a significant relationship between nutritional awareness and family behavior

towards peptic ulcer. The high Odds Ratio, 27.04, indicates that nutritional awareness has a very large influence on family behavior.

The third variable, clean water facilities, showed a p value of 0.001, indicating a significant relationship with family behavior towards peptic ulcers. The Odds Ratio of 7.54 indicates that the presence of clean water facilities can increase the likelihood of family behavior supporting peptic ulcers by 7.54 times. Furthermore, officer coaching has a p value of 0.011, indicating a significant relationship with family behavior towards peptic ulcer. The Odds Ratio of 4.48 indicates that officer coaching has a considerable influence on family behavior.

Finally, apparatus support has a p value of 0.023, indicating a significant relationship with family behavior towards peptic ulcer. The Odds Ratio of 2.7 indicates that apparatus support can increase the likelihood of family behavior supporting peptic ulcer by 2.7 times. Overall, the univariate test results confirmed that family attitudes, nutritional awareness, clean water facilities, officer guidance, and official support were significantly associated with family behavior towards peptic ulcer.

3.2. Discussion

Based on the results of multivariate analysis on the influence of determinants of gastritis incidence in the community, it shows that one of the factors that significantly influence the incidence of gastritis, namely diet (0.000). The results of the analysis obtained the OR value is 23.774 with is 3.169, meaning that someone with an irregular diet can increase the risk of experiencing gastritis by 23.774 times greater than people who have a regular diet. From the analysis, the OR value is 0.250 with is -1.385, meaning that coffee consumption can reduce the risk of experiencing gastritis.

This is supported by previous research conducted by Barkah & Agustiyani (2021), where based on the results of the analysis it is known that an irregular diet is prone to gastritis. According to (Hinkle & Cheever, 2018), the stomach will naturally continue to produce gastric acid in small amounts after 4-6 hours after eating, where usually blood glucose has been absorbed and used so that the body will feel hungry. At this time the amount of stomach acid is stimulated, so if someone is late eating for 2-3 hours, the stomach acid produced will be more and more excessive, resulting in irritation of the gastric mucosa. This irritation can cause pain around the epigastrium (Barkah & Agustiyani, 2021). Furthermore, in previous studies it was also found that someone with a fairly dense activity resulted in an irregular diet. Apart from activities and work, there are also factors of one's economic limitations in efforts to fulfill nutrition and factors of one's habits towards certain types of food, where these foods, if consumed excessively, can cause gastric ulcers (Sumbara & Ismawati, 2020).

In addition, from the results of multivariate analysis of the influence of determinants of gastric ulcer incidence in the community of Panga District, Aceh Jaya Regency, another factor was also obtained that significantly influenced the incidence of gastritis, namely coffee consumption (0.019). From the results of the analysis obtained the OR value is 0.250 with is -1.385, meaning that someone who usually consumes coffee can reduce the risk of experiencing gastric ulcer incidence by 0.250 times greater than those who do not usually consume coffee.

The results of the above analysis are associated with protective factors, which are different from risk factors (Bayti et al., 2021). Protective factors are factors that can alleviate, buffer, block, and even reduce the influence of risk on development and behavior (Fadzlul et al., 2016). This is seen in this study, where the habit of consuming coffee has an effect on reducing the risk of peptic ulcer incidence. This is supported by previous research, which found that daily coffee consumption can reduce the risk of gastric cancer, especially among women (Ainslie-Waldman et al., 2014). In addition, in another study on the effects of coffee on the gastrointestinal tract, it was found that the results did not support a direct effect of coffee but rather a combined effect of digestion, which was found that the results did not support a direct effect of coffee but rather a combined or additional effect of other factors such as obesity and poor diet. Furthermore, it is also known that coffee consumption has not been reported to produce deleterious effects on various organs of the gastrointestinal tract (Nehlig, 2022). This is in line with this study, where there are people in Panga District, Aceh Jaya Regency who do not usually consume coffee, but not a few of them usually consume coffee in excess. So, apart from the variable of regular coffee consumption acting as a protective factor, there are also other combined or additional factors that cause a variable to become a protective factor, where these other factors were not examined in this study (Firdausy et al., 2022).

4. CONCLUSION

Based on the results of most of the research, the results of the Chi-Square test analysis show that all independent variables, namely diet, coffee consumption, sleep patterns, stress levels have a significant relationship to the dependent variable, namely the incidence of gastric ulcers. For the results of logistic regression analysis on the influence of determinants of gastric ulcer incidence, it shows that diet and coffee consumption have a significant effect on the incidence of gastritis in the community of Panga District, Aceh Jaya Regency, while the other two factors, namely sleep patterns and stress levels, do not have a significant effect on the incidence of gastritis in the community of Panga District, Aceh Jaya Regency.

From the statistical analysis that has been carried out and the discussion that has been stated, it can be concluded that a significant factor in gastric ulcers Gastric ulcers can occur to anyone, especially if you have an unhealthy lifestyle. from the results of multivariate analysis of the influence of determinants of gastric ulcer incidence in the community of Panga District, Aceh Jaya Regency, another factor that has a significant effect on the incidence of gastric ulcers is also obtained, namely coffee consumption (0.019). From the results of the analysis obtained the OR value is 0.250 with is -1.385, meaning that someone who usually consumes coffee can reduce the risk of experiencing gastric ulcer incidence by 0.250 times greater than those who do not usually consume coffee. Further research is needed with further scientific review with more complex analysis variables and related to cholesterol levels, using analysis and statistical tests and a more in-depth research design.

REFERENCES

Ainslie-Waldman, C. E., Koh, W.-P., Jin, A., Yeoh, K. G., Zhu, F., Wang, R., Yuan, J.-M., & Butler, L. M. (2014). Coffee intake and gastric cancer risk: the Singapore Chinese health study. *Cancer Epidemiology, Biomarkers & Prevention*, *23*(4), 638–647. https://doi.org/10.1158/1055-9965.EPI-13-0886

Al_Bairmani, Z. A. A., & Ismael, A. A. (2021). Using Logistic regression model to study the most important factors which affects diabetes for the elderly in the City of Hilla/2019. *Journal of Physics: Conference Series*, *1818*(1), 12016. https://doi.org/10.1088/1742-6596/1818/1/012016

Barkah, A., & Agustiyani, I. (2021). Pengaruh pola makan dengan kejadian gastritis di puskesmas setu i. *Jurnal Antara Keperawatan*, *4*(1), 52–58.

Bayti, C. S., Indah, I., Jubaidah, J., Priani, N. K., & Jayanthi, S. (2021). Gambaran Pola Hidup Mahasiswa Perantauan terhadap Kejadian Gastritis di Universitas Samudra, Aceh. *Biologi Edukasi: Jurnal Ilmiah Pendidikan Biologi*, *13*(1), 43–47. https://doi.org/10.24815/jbe.v13i1.21841

Ciu, T., & Oetama, R. S. (2020). Logistic regression prediction model for cardiovascular disease. *IJNMT (International Journal of New Media Technology)*, *7*(1), 33–38.

Fadzlul, F., Saputra, N. E., Ekawati, Y. N., & Periantalo, J. (2016). Identifikasi faktor protektif dan resiko pada siswa di Kota Jambi. *Jurnal Psikologi Jambi*, *1*(1), 1.

Firdausy, A. I., Amanda, K. A., Alfaeni, S. W., Amalia, N., Rahmani, N. A., & Nasution, A. S. (2022). Hubungan Pola Makan Dan Stres Dengan Kejadian Gastritis Pada Mahasiswa Fakultas Ilmu Kesehatan Universitas Ibn Khaldun. *Contagion: Scientific Periodical Journal of Public Health and Coastal Health*, *3*(2), 75–86.

Hall, J. E. (2021). *Guyton & Hall. Tratado de fisiología médica*. Elsevier Health Sciences.

Hinkle, J. L., & Cheever, K. H. (2018). *Brunner and Suddarth's textbook of medical-surgical nursing*. Wolters kluwer india Pvt Ltd.

Nehlig, A. (2022). Effects of coffee on the gastro-intestinal tract: a narrative review and literature update. *Nutrients*, *14*(2), 399.

Obafemi, C. A., Adegbite, O. B., Fadare, O. A., Iwalewa, E. O., Omisore, N. O., Sanusi, K., Yilmaz, Y., & Ceylan, Ü. (2021). Tryptanthrin from microwave-assisted reduction of isatin using solid-state-supported sodium borohydride: DFT calculations, molecular docking and evaluation of its analgesic and anti-inflammatory activity. *Heliyon*, *7*(1), e05756. https://doi.org/10.1016/j.heliyon.2020.e05756

Rana, R., & Singhal, R. (2015). Chi-square test and its application in hypothesis testing. *Journal of Primary Care Specialties*, *1*(1), 69–71.

Roberts, S. D., Farber, M. O., Knox, K. S., Phillips, G. S., Bhatt, N. Y., Mastronarde, J. G., & Wood, K. L. (2014). FEV1/FVC ratio of 70% misclassifies patients with obstruction at the extremes of age. *Chest*, *130*(1), 200–206. https://doi.org/10.1378/chest.130.1.200

Samiasih, A. (2023). *proses terjadinya tukak lambung dan pencegahannya*.

Saputri, F. C., Sari, S. P., & Munim, A. (2014). Pengembangan metode induksi tukak lambung. *Majalah Ilmu Kefarmasian*, *5*(2), 84–90. https://doi.org/10.7454/psr.v5i2.3422

Saverio, S. Di, Bassi, M., Smerieri, N., Masetti, M., Ferrara, F., Fabbri, C., Ansaloni, L., Ghersi, S., Serenari, M., & Coccolini, F. (2014). Diagnosis and treatment of perforated or bleeding peptic ulcers: 2013 WSES position paper. *World Journal of Emergency Surgery*, *9*(45), 1–15. https://doi.org/10.1186/1749-7922-9-45

Schober, P., & Vetter, T. R. (2019). Chi-square tests in medical research. *Anesthesia & Analgesia*, *129*(5), 1193.

Sumbara, S., & Ismawati, Y. (2020). Hubungan Pola Makan dengan Kejadian Gastritis Wilayah Kerja Puskesmas Cinunuk. *Jurnal Ilmiah Kesehatan Iqra*, *8*(1), 1–5.

West, P. W. (2016). Simple random sampling of individual items in the absence of a sampling frame that lists the individuals. *New Zealand Journal of Forestry Science*, *46*(15), 1–7. https://doi.org/10.1186/s40490-016-0071-1

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