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The Relationship Between Stress and Eating Habits and the Occurrence of GERD in Medical Students

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ABSTRACT

Introduction: Gastro Esophageal Reflux Disease (GERD)is a disorder when food that has entered the stomach, goes back up into the esophagus or reflux, from several literature that has been read, in Indonesia many people experience this due to excessive stress, researchers develop existing research using the object and focus of research different. Research was conducted to determine the relationship between stress and eating patterns consisting of regular eating, consumption of spicy food, and consumption of fatty foods in UNS medical faculty students.
Method: The research carried out was quantitative research with an observational analytical design and a cross-sectional approach. The research was conducted at the Faculty of Medicine, Universitas Sebelas Maret with a sample of 102 students, namely students from the Faculty of Medicine class 2020-2022. In collecting data, researchers used the GERD-Q questionnaire, the meal pattern questionnaire, FFQ and PSS. Followed by analyzing the data through editing, coding, scoring, tabulating, univariate, bivariate and multivariate analysis.
Results: (1) There is a significant relationship between stressful conditions and the incidence of Gastroedophageal Reflux Disease (GERD) in UNS medical students; (2) there is a significant relationship between eating habits consisting of regular eating, consuming spicy food, consuming oily food and the incidence of Gastroedophageal Reflux Disease (GERD) in UNS medical students;
(3) Based on a multivariate test, it was found that the most significant independent variable in the incidence of Gastroedophageal Reflux Disease (GERD) in UNS medical students was the habit of consuming oily/fatty foods which was 2 times faster in triggering the occurrence of GERD.
Conclusion: From the discussion presented, it can be concluded that there is a significant relationship between stress and eating habits and the occurrence of GERD.
Keywords: relationship between eating; Gastro Esophageal Reflux Disease; GERD; students; stres

INTRODUCTION

Gastro Esophageal Reflux Disease (GERD) is a disorder when food that has entered the stomach returns to the esophagus or refluxes[1]. GERD occurs due to a pathological condition where gastric juice refluxes repeatedly into the esophagus in excess of the amount it should and causes typical symptoms such as heartburn, a sour and bitter taste on the tongue, pain in the epigastrium (heartburn) and difficulty swallowing food or drink[1]. Based on data from the Ministry Health, Indonesia is in the top ten with the most GERD sufferers as quoted from national online news. The prevalence of GERD,

according to the results of Professor Ari's study with various doctors in Indonesia, reached 27.4%. Almost every year the number of GERD patients continues to increase.

Changes in student behavior and lifestyle, such as eating patterns, are one of the factors that can influence the occurrence of GERD. Foods that can increase the risk of gastroesophageal reflux include spicy foods, caffeinated foods or drinks, alcoholic drinks, and also chocolate[2]. Apart from food, other risk factors for GERD are genetics, diet, smoking, nonsteroidal anti-inflammatory drugs (NSAIDs), and obesity. Research also shows a link between stress and GERD.

Esophageal hypersensitivity is one of the factors that determines symptoms in reflux events. Central mechanisms, associated with altered processing of afferent signals from the esophagus, are also involved in the pathogenesis of esophageal hypersensitivity. In this case, stress is one of the factors that can influence this central mechanism[3]. Connection The relationship between stress and GERD can occur in two directions, both stress affecting GERD and GERD affecting stress.

Spicy foods can cause direct irritation of the lower esophageal mucosa which is already inflamed and can worsen heartburn which is a symptom of GERD[4]. In addition, the capsaicin content in spicy food is known to increase LES (Lower Esophageal Sphincter) pressure, contraction and esophageal conduction speed, so that the spicier the food, the more significant the impact on the esophagus and stomach will be[5].

The reason researchers conducted this research on UNS Faculty of Medicine students was because of academic demands so that stress occurred more often in medical students. Academic demands that must be met include difficult exams and coursework, busy study time, and lack of rest time. This also makes students' diets worse. Eating becomes irregular, the preference for consuming spicy and fatty foods which is a current phenomenon is often done by students. Based on urgency, this research aims to (1) determine the relationship between stress and the incidence of GERD in UNS Medical students and (2) analyze the relationship between eating habits and the incidence of GERD in UNS Medical students.

METHOD

The research carried out was quantitative research with an observational analytical design and a cross-sectional approach. A cross-sectional approach was used in this research because both variables, namely the independent and dependent variables, were studied at the same time. The research was conducted at the Faculty of Medicine, Universitas Sebelas Maret starting in July 2023 with a sample of 102 students, namely students from the Faculty of Medicine Class 2020-2022.

In collecting data, researchers used the GERD-Q questionnaire, the meal pattern questionnaire, FFQ and PSS. Followed by analyzing the data through editing, coding, scoring, tabulating, univariate, bivariate and multivariate analysis.

RESULT

Validity test

Validity testing is carried out to measure whether a questionnaire is valid or not. Validity test use The SPSS used to test validity uses Pearson's product moment correlation technique. R-table 0.195. The following are the results of validity testing on the variables Eating Regularity (X1), Spicy Food Consumption (X2), Fatty/Oily Food Consumption (X3), Stress (X4) and GERD Incidence (Y).

1. Eating Regularity
   Validity test results. Eating Regularity (X1) shows if all r-counts of question items have a value greater than the r-table value of 0.195, it can be concluded that the statement is valid and can be used as a valid measuring tool for further analysis.
2. Consume Spicy Foods

Validity test results for Spicy Food Consumption (X2) show if all the r-counts of the question items have a value greater than the r-table value of 0.195, it can be concluded that the statement is valid and can be used as a valid measuring tool for further analysis.

3. Validity Test of Fatty/Oily Food Consumption
   Validity test results for Fatty/Oily Food Consumption (X3) show that all r-counts of question items have values greater than the r-table value of 0.195, it can be concluded that the statement is valid and can be used as a valid measuring tool for further analysis.
4. Validity Test of Perceived Stress Scale (PSS)
   Validity test results of Perceived Stress Scale (PSS) (X4) show If all r-counts of question items have a value greater than the r-table value of 0.195, it can be concluded that the statement is valid and can be used as a valid measuring tool for analysis furthermore.
5. GERD Incidence Validity Test
   Validity test results for GERD incidence (Y) show that all r-calculated question items have a value greater than the r-table value of 0.195 and a significance value of less than 0.05, it can be concluded that the statement is valid and can be used as a valid measuring tool for further analysis.

Reliability Test

Reliability tests are carried out to measure reliability questionnaire study. A questionnaire can be said to be reliable if a respondent's answers are consistent over time. A variable is said to be reliable if it has a Cronbach alpha of more than 0.60. The following are the results of data processing tests for the variables Eating Regularity (X1), Spicy Food Consumption (X2), Fatty/Oily Food Consumption (X3), Stress (X4) and GERD Incidence (Y).

The variables Eating Regularity (X1), Spicy Food Consumption (X2), Fatty/Oily Food Consumption (X3), Perceived Stress Scale (PSS) (X4) and GERD Incident (Y) have a Cronbach alpha value greater than the alpha value, namely 0, 60 So it can be concluded that all variables are said to be reliable.

Univariate Test

1. Respondent Characteristics
   Respondents in this study were active students at the UNS Faculty of Medicine who met the inclusion and exclusion criteria with a total sample of 102 respondents. The data collection process uses observation data to observe directly and fill out questionnaires to assess the variables Eating Regularity, Spicy Food Consumption, Fatty/Oily Food Consumption, Stress and GERD Incidence. The results show that of the 102 respondents, 27 respondents (26.4%) were male and 75 respondents (73.6%) were female. These data show that the majority of respondents in this study were male respondents.
   Characteristics of respondents based on generation of 102 respondents, there were 32 respondents (31.4%). class of 2020, 34 respondents (33.3%) were from the class of 2021, while from the class of 2022 there were 36 respondents with a percentage (35.3%). These data show that the majority of respondents in this study were class of 2022 (35.3%).
2. Regularity Eat
   The results show that respondents have a regular or daily eating pattern, namely 3 respondents out of 102 respondents or 2.9% while percentages The highest was eating regularity for 13-15 days as many as 41 respondents or 40.2% of the total number of respondents.
3. Consume Spicy Foods
   Respondents have the highest habit of eating spicy food, namely habit spicy consumption in the period 1-3x a month, namely 60 respondents out of 102 respondents or 58.8% while percentages the lowest consumption of spicy food once a day for 2 respondents or 2% of the total number of

respondents.

4. Consumption of Fatty/Greasy Foods
   Respondents have the highest fatty eating habits, namely the habit of consuming spicy food 1-3 times a month, that is 47 respondents out of 102 respondents or 46.1%, meanwhile percentage the lowest consumption of spicy food >1x / day as much as 1 respondent or 1% of the total number of respondents.
5. *Perceived Stress Scale (PSS)*
   Respondents had the highest level of stress conditions, namely sometimes as many as 45 respondents out of 102 respondents or 44.1% while percentages The lowest is very frequent stress conditions, as many as 1 respondent or 1% of the total number of respondents
6. GERD occurrence
   Most of the respondents had never experienced GERD, 56 respondents out of 102 respondents or 54.9%, while percentages the lowest is that respondents experienced GERD, namely as many as 10 respondents or 9.8% of the total number of respondents

Test results Bivariate

1. Relationship between respondent gender and GERD incidence
   Sig or p value value of *0.060. This value shows that there is no significant influence of gender on the incidence of GERD in active students at the UNS Faculty of Medicine*
2. Relationship between Respondent Force and GERD Incidence
   Significance or p value value of *0.086. The value indicates No.* There is a significant influence of class on the incidence of GERD in active students at the Faculty of Medicine, UNS.
3. Relationship between eating regularity and GERD incidence
   The results of the chi square test were used to determine the relationship between eating regularity and the incidence of GERD. The results of the chi square test between eating patterns and the incidence of GERD show a p value of 0.026 or <0.05, which means that eating regularity has a significant influence on the incidence of GERD. Eating regularity resulted in a sig value of <0.25 so it can be concluded that the research data can be continued at the next stage, namely the multivariate test.
4. Relationship between spicy food consumption and GERD incidence
   The results of the chi square test were used to determine the relationship between consumption of spicy food and the incidence of GERD. The results of the chi square test between eating patterns and the incidence of GERD show a p value of 0.025 or <0.05, which means that consumption of spicy food has a significant influence on the incidence of GERD. Consumption of spicy food resulted in a sig value of <0.25, so it can be concluded that the research data can be continued at the next stage, namely the multivariate test.
5. Relationship between consumption of fatty/oily foods and the incidence of GERD
   The results of the chi square test were used to determine the relationship between consumption of oily/fatty foods and the incidence of GERD. The results of the chi square test between diet and the incidence of GERD show a p value of 0.003 or <0.05, which means that consumption of oily/fatty foods has a significant influence on the incidence of GERD. Consume oily food The result was a sig value <0.25 so it could be concluded that the research data could be continued at the next stage, namely the multivariate test.
6. Relationship between Perceived Stress Scale (PSS) and the incidence of GERD
   The results of the chi square test were used to determine the relationship between stress conditions and the incidence of GERD. The results of the chi square test between the Perceived Stress Scale and the incidence of GERD show a p value of 0.006 or <0.05, which means that stressful conditions have a significant influence on the incidence of GERD. Stress conditions resulted in a sig value of

<0.25 so it can be concluded that the research data can be continued at the next stage, namely the multivariate test.

Multivariate Test Results

The multivariate test uses 4 modeling steps. First, enter the four dependent variables, namely eating regularity, spicy food consumption, oily food consumption and stress conditions. In the first modeling step, the largest P value for eating regularity was not significant, namely 0.717, so it was removed from the next step automatically. Then, in the second modeling step, the spicy food consumption variable obtained an insignificant P value of 0.459 and was also removed in the next modeling step. After that, the modeling continued with the next step, where it was found that the stress variable had an insignificant P value of 0.355, so it was removed in the next step. In the next step, it was found that consumption of fatty/oily foods had the most significant P value, namely 0.036. Based on the P value, consumption of fatty/oily foods gets the highest OR (Odds Ratio) value, namely 1.900. Based on analysis with factors The independent factor is that consumption of fatty/oily foods is the most significant factor in the incidence of GERD in students. The OR value shows that students from the Faculty of Medicine at UNS who consume fatty/oily foods are 2 times more likely to develop GERD.

DISCUSSION

The relationship between stress conditions and the incidence of GERD in students at the Faculty of Medicine, Universitas Sebelas Maret

The results of the research showed that the number of respondents who experienced GERD in sometimes stressful conditions was 44%, while 15% often experienced GERD. Situations that experience more stress than those who don't often experience stress. Based on the results of the chi square test between the Perceived Stress Scale and the incidence of Gastroesophageal Reflux Disease (GERD), it shows a p value of 0.003 or <0.05, which means that stressful conditions have a significant influence on the incidence of GERD. These results are the same as research conducted by Aritonang[6] which stated that there was a significant influence between stress and the incidence of GERD.

The condition of the body which is under a lot of pressure from life's problems due to ongoing stress and emotions causes the body to adapt to this situation[7]. Excessive stress will cause an excessive increase in HCL acid in the stomach and stress can also stimulate the production of stomach acid, causing GERD. Gastroesophageal Reflux Disease (GERD) is a condition of reflux of stomach contents into the esophagus which can cause typical symptoms such as heartburn (burning feeling in the epigastric area), acid regurgitation (bitter taste in the mouth), nausea, and dysphagia which can result in damage to the esophageal mucosa and in the long term can cause complications such as Barrett's esophagus[8]. One of the most common causes of acid reflux disease is a hiatal hernia. This problem occurs when the upper part of the stomach and sphincter move over the diaphragm, which is the muscle that separates the stomach from the chest. Normally, the diaphragm helps to keep acid in the stomach. However, because of this disorder, acid can rise into the esophagus and cause symptoms of GERD[9].

GERD mostly occurs in women, as in the research conducted the respondents were dominated by women. According to Ardhan et al[10] stress or emotions occur more often in women than men. Women more often experience stress, anxiety and experience a lot of pressure in their lives. According to Mile[11],most respondents who experienced GERD occurred in women. In several studies, it is known that women are more likely to be exposed to diseases related to the digestive problem Gastroedophageal Reflux Disease (GERD). Because women often diet too strictly, there are different eating activities as well as differences in activity and body composition. These results are in accordance with research[12].

Stress is a condition produced by environmental changes that are accepted as challenging, threatening or damaging to a person's dynamic balance or equilibrium[11]. Excessive stress is one of the

trigger factors because it causes increased stomach acid production. This causes the incidence of gastritis to be linked to a person's psychological state. Gastric acid production will increase in stressful situations, such as excessive workload, anxiety, fear, or being rushed. This increased stomach acid level will cause discomfort in the stomach. Gastric acid production will increase in stressful situations, for example heavy workloads, panic and haste. Increased stomach acid levels can irritate the gastric mucosa and if this is left for a long time it can cause stomach disease[7].

The relationship between eating habits and the incidence of GERD in students at the Faculty of Medicine, Universitas Sebelas Maret

The results of the study showed that most of those who experienced GERD had irregular eating habits and based on the results of the chi square test between eating habits, both regular eating, the habit of eating spicy food and eating oily/fatty food on the incidence of Gastroedophageal Reflux Disease (GERD) showed p value < 0.05, which means that eating habits have a significant influence on the incidence of GERD. This is supported by the statement of Ajjah et al[13] who stated that eating habits influence the incidence of GERD where the results of respondents who experience the habit of eating spicy food and eating oily/fatty food are higher than respondents who do not experience bad eating habits.

Eating habits that trigger Gastroedophageal Reflux Disease (GERD) are irregular eating frequency with small portions, consuming foods and drinks that trigger an increase in stomach acid. According to Ardhan et al[10] which states that one of the causes of gastric disease is due to indigestion, excessive acid production due to an imbalance of aggressive and defensive factors. which causes HCL production in the stomach to increase, this is due to poor eating habits such as irregular meal times, consume spicy food and often consume oily/fatty foods.

The results of the study showed that the majority of UNS medical students who experienced GERD were due to irregular eating habits. This may be because the majority of respondents experience stress, where people who experience stress tend to feel like they have lost their desire to eat or have a reduced appetite. Students' eating patterns can be influenced by several factors, due to the busy schedule of lecture activities, discussions and organizational activities outside of lectures which causes the poor eating patterns of medical students so that students tend to choose to consume fast food and often skipping breakfast, apart from that, the influence of the busy activities of medical students means that students have difficulty managing time to eat and rest and tend to eat carelessly as long as their stomachs are full, even at night students tend to eat a lot. consume snacks and coffee to accompany evening study time[13].

The results of statistical tests show that there is a relationship between regular eating habits and the incidence of GERD. This is also in accordance with what was stated by Mile et al[11] that the stomach produces gastric acid to digest food on a regular schedule even in conditions sleep too The stomach continues to produce stomach acid, therefore if our eating patterns are irregular it can cause symptoms of stomach ulcers because no food is digested by the stomach.

The results of the study showed that the number of respondents who experienced GERD had a habit consume more spicy food than those who don't often consume spicy food. This may be due to the difficulty of getting rid of the habit of consuming spicy-tasting food and the respondents in this study were mostly female, where the tendency to consume spicy food is quite high. The results of statistical tests also show that there is a significant influence between habits consuming spicy food on the incidence of GERD[6]. The research data also shows that the majority of respondents also experienced GERD incidents consume oily/fatty foods. This is the same as research conducted by Sani et al[14] who stated that the incidence of gastric pain was more common in respondents who had the habit of consuming sour, salty, spicy and fatty foods.

The relationship between eating regularity, consuming spicy foods, consuming oily/fatty foods and stress conditions on the incidence of GERD in students at the Faculty of Medicine, Universitas Sebelas Maret

The results of multivariate analysis through logistic regression show that the independent variables are eating regularity, consuming spicy food, consume Oily/greasy food and stress conditions on the dependent variable for GERD incidence resulted that consumption of fatty/oily food has the most significant factor in the incidence of GERD in UNS medical students. The OR value shows that students from the Faculty of Medicine at UNS who consume fatty/oily foods are 2 times more likely to develop GERD. This agrees with research conducted by Sani et al[14] which states habits consume trigger food shappen Gastric acid such as spicy, sour and oily foods is the main factor in respondents triggering GERD.

Medical students often experience high levels of stress and poor eating habits. This is mainly due to the amount and complexity of material that must be studied, making medical students vulnerable to stress. Excessive stress affects students' eating patterns. Believes that eating patterns (frequency of eating, type of food and portions of food) or various information that provides an overview of the various kinds and amounts of food eaten every day by one person and is a characteristic for a group. The research results show that regular eating, consuming spicy food, consumed oily/fatty foods and stress have a big influence on incident GERD[15]. These irregular food habits should be eliminated from students.

The habit of eating spicy food influences the incidence of GERD. The habit of eating too much spicy and sour food can also irritate the stomach, causing inflammation of the gastric mucosa and causing symptoms of GERD[16]. This is because the active substance in chili and pepper, namely capsaicin, can induce hyperalgesia through activation of the Transient Receptor Potential Vanilloid 1 (TRPV1) receptor, causing symptoms of stomach pain[17].

Habit consuming Acidic foods were significantly associated with the incidence of GERD in this study. This result is in accordance with a previous study conducted by Pesce et al (2020) which stated that Acidic foods are the type of food most often reported to trigger GERD symptoms. The response to poor eating habits that these students have tends to cause symptoms such as heartburn, stomach ache, nausea and flatulence, this is because the student's preferences are high.consume varied foods such as consuming foods with a spicy or sour taste, coupled with their habit of delaying meal plans and large portions. This is in accordance with Rimbawati[7] statement which states that eating large portions can cause reflux of stomach contents, which in turn will cause the strength of the stomach walls to decrease, conditions like this can cause inflammation or wounds in the stomach. Meanwhile, consuming excessive amounts of spicy or acidic food will stimulate the digestive system, if this condition persists there will be excess acid which will irritate the mucosal walls of the stomach[16].

Habit consuming Fatty foods were significantly associated with dyspepsia in this study. These results are in line with previous studies. In a laboratory study conducted by Khodarahmi[19], it was found that adding fat to food resulted in more symptoms of gastric fullness, bloating and nausea in sufferers of gastric disease. Fatty foods can increase the release of the hormone cholecystokinin. This hormone plays a role in releasing enzymes produced by the pancreas and slowing gastric emptying through contraction of the pylorus[18]. The main mechanisms by which fatty foods can worsen dyspeptic symptoms are related to delayed gastric emptying and hypersensitivity to gastrointestinal hormones. It is known that intra duodenal lipid diffusion can increase the sensitivity of the proximal stomach to distension, which may occur due to the specific effect of fat on the release of the hormone cholecystokinin (CCK). This hormone plays a role in releasing enzyme enzyme pancreas and slows gastric emptying through contraction of the pylorus so that nutrients can be digested optimally. This is what causes feelings of nausea and fullness in the stomach[20].

CONCLUSION

From the discussion that has been presented, conclusions can be drawn, namely: following: (1) there is no relationship between the characteristics of the class of respondents and the incidence of Gastroedophageal Reflux Disease (GERD); (2) there is a significant relationship between stressful conditions and the incidence of Gastroedophageal Reflux Disease (GERD) in UNS medical students; (3) There is a significant relationship between eating habits consisting of regular eating, consuming spicy food, consumed oily food on the incidence of Gastroedophageal Reflux Disease (GERD) in UNS medical students; (4) Based on a multivariate test, it was found that the most significant independent variable for the incidence of Gastroedophageal Reflux Disease (GERD) in UNS medical students was habit.consume Oily/fatty foods are twice as likely to trigger GERD.

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