

## The Relationship between Diet and Stress with Gastritis Symptoms in Adolescents at Integrated Agricultural Vocational Schools

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### Abstract

Adolescence is a productive age that can experience lifestyle changes that don't pay attention to health, making them susceptible to gastritis symptoms. Common causes of gastritis include improper eating patterns, such as inappropriate frequency or timing of meals, eating excessively and quickly, or consuming foods that are stimulating (too spiced and spicy). Gastritis can easily attack individuals who have irregular eating patterns. Stress affects changes in physiological functions in the body's systems, one of which is the digestive system. Stress can cause decreased appetite, stomach emptying, increased stomach acid, resulting in pain in the stomach. This study aims to determine the relationship between diet and stress and symptoms of gastritis in adolescents. This research is a cross sectional study conducted on 271 teenagers at the Integrated Agricultural Vocational School, Riau Province. The data collection tool is a questionnaire that is valid and has high reliability. The results of the analysis carried out using the chi square test showed that there was a significant relationship between diet and stress and symptoms of gastritis in adolescents as evidenced by a correlation value of  $0.000 < \alpha 0.05$ . After conducting research, the results showed that poor eating patterns and high levels of stress can result in symptoms of gastritis.

**Keywords:** Diet, Gastritis, Teenagers, Stress



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### INTRODUCTION

Adolescence is a time full of activity. Adolescents who engage in more physical activity have a lifestyle that causes stress and poor health, which can be exacerbated by environmental factors and put them at risk of developing gastritis (Wulandari et al., 2023). Gastritis or better known as ulcers is a digestive disease characterized by inflammation of the stomach wall which causes pain, heartburn and a burning sensation. Adolescents are a productive age group who are very vulnerable to ulcer symptoms due to their high activity, free lifestyle and tendency to stress (Tussakinah et al., 2018). The World Health Organization (WHO, 2019) states that every year, between 1.8 million and 2.1 million cases of gastritis are reported worldwide in all population groups. Based on WHO (2019), Indonesia has a very high incidence of gastritis (40.8%) with 274,396 cases out of a total population of 238,452,952. One of the ten most common diseases in Indonesia in 2019 according to data from the Ministry of Health of the Republic of Indonesia is gastritis. The Ministry of Health of the Republic of Indonesia (2018) reported that there were 30,154 (4.9%) cases of gastritis in hospital inpatient rooms in Indonesia (Ministry of Health of the Republic of Indonesia, 2018).

According to data from the Riau Provincial Health Service in 2022, the population of Riau Province in 2018 was 6,814,909 people with a gastritis prevalence of 11.23%, so there were around 54,325 cases of gastritis. Every year, gastritis cases are included in the category of the ten most common diseases in Riau Province, where in 2022 gastritis will be ranked third of the ten most common diseases with a total of 109,022 cases. Based on data obtained from the

Pekanbaru City Health Service (2022), there was an increase in gastritis cases in Pekanbaru in 2022, namely 133,341 cases. There were 1,404 cases of gastritis found in the teenage age group (15-19 years), consisting of 442 cases of gastritis in teenage boys and 962 cases of gastritis in teenage girls. Inflammation of the gastric mucosa results in gastritis which is characterized by epigastric discomfort, nausea, vomiting, anorexia and headaches. Gastritis is most often caused by mycobacterium and helicobacter pylori infections. Other factors that cause gastritis that are most commonly found include inappropriate eating patterns, such as inappropriate frequency or timing of meals, eating excessively and quickly, or consuming foods that are stimulating (too spiced and spicy) (Hernanto, 2018). Research conducted by Putri et al. (2018) stated that teenagers who have a high level of busyness and thoughts during the transition period (anxiety, conflict, group activities, and self-exploration) are at risk of developing gastritis/gastritis recurrence. High busyness will cause stress and a lifestyle that pays little attention to health, resulting in ignoring diet and types of food which can cause gastritis.

Pratiwi (2023) states that teenagers usually decide to adopt a deficient diet. Modern teenagers prefer fast food and do not consider the nutritional content or portion size. Today's teenagers often skip breakfast and reduce food portions because they are afraid of being overweight, especially with the variety of instant foods and drinks that are popular among them. This causes them to consume these foods and drinks more often than cooking themselves and drinking mineral water. Doing this habit continuously can cause gastritis. Carolin (2013) explained that stress influences changes in physiological functions in the body's systems, one of which is the digestive system. Stress can cause decreased appetite, stomach emptying, increased stomach acid, resulting in pain in the stomach. According to Kurnilawati (2021) conditions related to stress can cause gastritis which is common in teenagers. Pressure is the main cause of stress that often attacks teenagers. Pressure can arise from individual factors or from outside the individual. Anger and annoyance, difficulty sleeping, difficulty concentrating, heart palpitations, headaches, and decreased appetite are early symptoms of stress. If stress is not managed well, the body will get used to being under pressure. Conditions like this can cause pathological changes in the body's organ tissue through the autonomic nerves which can ultimately result in gastritis.

A preliminary study was conducted by researchers at the Integrated Agricultural Vocational School of Riau Province on January 25th 2024. Researchers conducted informal interviews about eating patterns, stress and symptoms of gastritis with 15 female students (9 women and 6 men) and obtained the results that A total of 10 female students (6 women and 4 men) had a history of gastritis. As many as 6 of the 15 female students have characteristics in their eating patterns, namely the frequency of eating less than 3 times a day, eating breakfast occasionally, being used to eating ready-to-eat foods and often consuming sour and spicy foods. However, 4 other female students with a history of gastritis admitted to having a regular eating pattern, namely not skipping breakfast and eating on time, and not liking to eat sour and spicy foods. Furthermore, 5 out of 15 female students who did not have a history of gastritis admitted to having a good and regular diet and eating habits. Apart from that, the aim of the researchers was to choose teenagers as research targets because in this age group they tend to have unhealthy lifestyles such as paying less attention to eating habits, the foods they usually consume, both in terms of diet and type of food. Based on the description above and the results of a preliminary study on adolescents at the Integrated Agricultural Vocational School, Riau Province, it encourages researchers to conduct research on "The Relationship between Diet and Stress and Gastritis Symptoms in Adolescents at the Integrated Agricultural Vocational School, Riau Province".

**RESEARCH METHODS**

This research is quantitative in the form of correlation descriptions using a cross sectional approach. The sample in this study were teenagers at the Integrated Agricultural Vocational School, Riau Province. The number of samples used in this research was 271 people taken based on the proportionate stratified random sampling technique. The inclusion criteria in determining the research sample were: teenagers aged 15-17 years and willing to become research respondents by signing informed consent. Data collection in this study used an eating pattern questionnaire consisting of 17 questions using an ordinal scale, Sheldon Choen's Perceived Stress Scale (PSS-10) to assess adolescent stress levels which has been translated into Indonesian and has been validated previously, and a symptom questionnaire. gastritis which consists of 14 questions using an ordinal scale. Data analysis used in this research was the chi square test using the degree of confidence limit ( $\alpha = 0,05$ ).

**RESEARCH RESULTS AND DISCUSSION**

**Univariate Analysis**

**Table 1. Respondent Characteristics**

Characteristics	Frequency (n)	Percentage (%)
Age		
1. 15 years old	75	27.7%
2. 16 years old	70	25.8%
3. 17 years old	126	46.5%
Gender		
1. Man	145	53.5%
2. Woman	126	46.5%
Residence History		
1. With parents/family	221	81.5%
2. Without parents/family	50	18.5%
Total	271	100%

Based on Table 1, looking at the characteristics of research results from research carried out from April 2024 to May 2024, it can be concluded that the majority of students aged 17 years are 126 respondents (46.5%). The majority of respondents have male genitals, namely 145 respondents (53.5%) and the majority of respondents have a history of living with parents/family, namely 221 respondents (81.5%).

**Table 2. Description of Respondents' Eating Patterns**

Characteristics	Frequency (n)	Percentage (%)
Good	0	0%
Moderate	239	88.2%
Poor	32	11.8%
Total	271	100

Based on table 2, it is known about the general description of eating patterns that the majority of respondents, namely 239 respondents (88.2%) have a moderate eating pattern).

**Table 3. Description of Respondents' Stress**

Characteristics	Frequency (n)	Percentage (%)
Normal	8	3.0%
Light	194	71.6%
Heavy	69	25.5%
Total	271	100%

Based on table 3 regarding the general description of stress, it shows that the majority of respondents experienced mild stress, namely 194 respondents (71.6%).

**Table 4. Description of Respondents' Gastritis Symptoms**

Characteristics	Frequency (n)	Percentage (%)
There were no symptoms of gastritis	145	53.5%
There are symptoms of gastritis	126	46.5%
<b>Total</b>	<b>271</b>	<b>100%</b>

Based on table 4 regarding the general description of gastritis symptoms, it is known that the majority of respondents did not have gastritis symptoms, namely 145 respondents (53.5%).

**Bivariate Analysis**

**Table 5. Relationship Between Diet and Gastritis Symptoms of Respondents**

Dietary Habit	Gastritis Symptoms				Total		P value
	Yes		No				
	n	%	n	%	n	%	
Moderate	116	48.5	123	51.5	239	100	0.000
Poor	29	90.6	3	9.4	32	100	
<b>Total</b>	<b>145</b>	<b>53.5</b>	<b>126</b>	<b>46.5</b>	<b>271</b>	<b>100</b>	

The results of the analysis in table 5 showed that there were 116 respondents (48.5%) who had a moderate diet and had no symptoms of gastritis, while 29 respondents (90.6%) who had a poor diet had no symptoms of gastritis. The statistical test results show that the p value = 0.000, which means the p value <  $\alpha$  0.05 so that Ho is declared rejected, so it can be concluded that there is a relationship between diet and symptoms of gastritis in teenagers at the Integrated Agricultural Vocational School, Riau Province

**Table 6. Relationship between Stress and Gastritis Symptoms of Respondents**

Stress	Gastritis Symptoms				Total		P value
	Yes		No				
	n	%	n	%	n	%	
Normal	7	87.5	1	12.5	8	100	0.000
Light	117	60.3	77	39.7	194	100	
Heavy	21	30.4	48	69.6	69	100	
<b>Total</b>	<b>145</b>	<b>53.5</b>	<b>126</b>	<b>46.5</b>	<b>271</b>	<b>100</b>	

The results of the analysis of table 6 regarding stress and symptoms of gastritis showed that there were 7 patients (87.5%) who did not experience stress and did not experience symptoms of gastritis, as many as 117 patients (60.3%) who experienced mild stress did not experience symptoms of gastritis, while as many as 21 respondents (30.4%) who experienced severe stress did not have symptoms of gastritis. The results of the statistical test indicate a p value = 0.000, which means p value <  $\alpha$  0.05 so that Ho is declared rejected, so it can be concluded that there is a relationship between diet and symptoms of gastritis in teenagers at Integrated Agricultural Vocational School, Riau Province

**Discussion**

**Respondent Characteristics**

**Age**

The results of the research that has been carried out indicate that out of 271 teenagers at the Integrated Agricultural Vocational School of Riau Province, it was found that the majority

of students were at the age of 17, namely 126 students (46.5%). The results of this research are in line with research conducted by Novitayanti (2020), data showed that the majority of teenagers who experienced symptoms of gastritis were 17 years old, namely 22 respondents (42.3%). Adolescents over time develop unhealthy and unintentional eating habits, sometimes to the point of experiencing eating disorders, especially those who are 17 years old or younger. This is because Meireika's daily activities are filled with studying, school duties and other responsibilities. As a result, they often ignore the time and type of food they eat, thereby increasing the risk of developing digestive problems such as ulcers or gastritis. Gastritis is a medical condition characterized by inflammation and infection of the mucosa and submucosa of the stomach (Tussakinah et al., 2018).

### **Gender**

The majority of teenagers at the Integrated Agricultural Vocational School of Riau Province are male, namely 145 respondents (53.5%). Gender is an internal factor that determines nutritional needs, so there is a relationship between gender and the occurrence of gastritis. According to Juliani et al., (2018) women are more at risk of developing ulcers than men because women pay more attention to body shape that is not fat, so women reduce the amount they eat without paying attention to healthy eating patterns. However, based on researchers' assumptions, men can also get gastritis due to various conditions, meaning that it is not only women who are at high risk of developing the disease. Adolescent boys often have a lazy attitude towards food preparation, which means negligent eating habits and neglect of nutrition, and due to high levels of exercise, many adolescent boys suffer from gastritis or adopt inappropriate diets.

### **Residence History**

The results of the research that has been carried out show that of the 271 respondents at the Integrated Agricultural Vocational School, Riau Province, it was found that the majority of respondents' residence history was with their parents/family, namely 221 respondents (81.5%). The findings of this research differ from the research of Milasari & Ruhyana (2017) which states that teenagers who live with their parents or family have eating habits that are regulated by their parents or family. In addition, teenagers who live at home with their parents or relatives tend to consume more previously processed foods and pay more attention to the amount of nutritious food they eat. The family also helps with the sound by reminding the teenager when he eats later than usual. Researchers have found that teenagers who take part in extracurricular activities at school spend more time outside the home and teenagers do not carry skills. As a result, teenagers have unintentional eating habits and only eat at home at night.

### **Description of Respondents' Eating Patterns**

The results of the research conducted showed that almost all respondents had a moderate eating pattern with a total of 239 respondents (88.2%). The results of this research are in line with Khafizha's (2021) research on teenagers in the Situ Community Health Center working area that the majority of respondents in his research had a moderate eating pattern, namely 37 respondents (61.7%). According to research findings, respondents usually ate less than three times a day, their portion sizes fluctuated, and they ate spicy and sour foods, as well as a lot of fast food, which tended to trigger gastritis. The habit that most significantly influences nutritional status is diet. This is because the quantity and quality of food and drinks consumed have an impact on public health and overall public health (Peraturan Menteri Kesehatan Republik Indonesia, 2014). According to Buulolo (2022), because teenagers like to play,

especially in the technological era which is busy with gadgets, millennial children today usually have moderate to poor eating patterns. They prefer foods that are flavored or drinks that are fizzy and colored. This is because snacks at school are more attractive, so these teenagers do not like processed food from home. Apart from that, they feel inferior to their classmates who like to snack, which makes it awkward for them to bring lunch from home. Apart from snacks, other causes include teenage boys who are so busy chatting and smoking with friends that they forget to eat.

### **Stres Description of Respondents' Stress**

The results of the research conducted showed that more than half of the respondents, namely 194 respondents (71.6%) experienced mild stress. The results of this research are in line with research by Ardawilly et al., (2023) that there were 79 respondents (52.0%) of teenagers in their research who had mild levels of stress. The emergence of stress among respondents can be caused by the many activities that must be handled and also the respondents' responsibilities as students with various academic and extracurricular tasks that must be followed, and respondents who live in dormitories complain that living far from their parents can sometimes cause stress. According to the American Psychiatric Association (2013), adolescence is a stressful period, so teenagers are required to survive and solve their own problems. Adolescents experience stress due to difficulty adapting to a new lifestyle and completing developmental tasks (Hastuti, 2021). Adolescence is a period that is busy with many extracurricular activities, groups, assignments, and other events outside of school that may cause stress (Suiwindiri & Ningruim, 2021). Teenagers usually associate stress with growing up or pressure that they are unable to handle. Adolescents have concerns about the transition to adulthood and finding their identity (Gamayanti et al., 2018). Muistika et al., 2021 Adrenaline or also called epinephrine is a stress hormone secreted by the adrenal glands and is responsible for the stress process. This hormone is distributed throughout the body, increasing blood pressure, heart rate, rapid breathing, and creating a state of tension and readiness for stress. When the body experiences stress, it will eventually return to calm and normal. When someone feels pressure from within or outside, their body naturally reacts by producing stress. There are a number of factors that might influence the respondent's stress level, including thoughts, family and the environment in which they live. According to disappointment, first-time problems, adjustment crises, unfulfilled desires, romance, competition, and bullying are the main causes of stress in teenagers. Regarding this fact, most respondents experienced stress from mild to severe levels, characterized by irritability, restlessness or anxiety, irritability, impatience, and finding it difficult to rest in accordance with the theory put forward by Sya'diyah (2017). It can be concluded that most teenagers at the Integrated Agricultural Vocational School of Riau Province have been able to control stress or manage stress and control their stress well in dealing with pressures that stimulate stress as evidenced by the average stress level of respondents being light. Generally, teenagers at the Riau Province Integrated Agricultural Vocational School divert stress by spending time exercising in the school environment, telling stories with trusted people, watching films, or looking for temporary pleasure such as shopping or hanging out with friends.

### **Relationship between Diet and Gastritis Symptoms of Respondents**

The results of this study show that there is a relationship between diet and symptoms of gastritis in teenagers at the Integrated Agricultural Vocational School, Riau Province, with the finding of  $p$  value = 0.000, which means  $p$  value < 0.05. The results of this study are in line with research conducted by Restiana (2019) and Apriyani (2021) which explained that there is a significant relationship between diet and symptoms of gastritis in adolescents. Another study

conducted by Ayuningsi (2021) stated that eating frequency and type of eating had a significant relationship with gastritis symptoms in adolescents. Several factors can cause gastritis, namely eating patterns such as irregular eating, types of food that stimulate an increase in stomach acid, inappropriate eating frequency, stress factors, alcohol, age, non-steroidal anti-inflammatory drugs (NSAIDs) and smoking. Apart from that, eating patterns that are not good in terms of quantity, type and function over a long period of time cause the body's need for 50 nutritional elements (including carbohydrates, protein and fat) to not be fulfilled, in addition to irregular eating frequency in the long term. a long time can also cause gastritis (Aguistin et al., 2010). An irregular eating pattern will increase the risk of gastritis because the stomach will always produce a certain amount of stomach acid. Usually the body feels hungry four to six hours after eating because a large amount of blood glucose has been absorbed and used up. Stimulation of stomach acid is what occurs at that time. More stomach acid is produced when a person is late eating for two to three hours, so it can irritate the gastric mucosa and cause pain (Barkah & Agustiyani, 2021). As a result of poor eating habits, teenagers tend to cause symptoms such as heartburn, stomach ache, nausea and flatulence, this is because teenagers like to consume a variety of foods, such as consuming foods with a spicy or sour taste, plus with their habit of delaying meal schedules and eating large portions. This is in accordance with Baliwati's statement which states that consuming large amounts of food can result in reflux of stomach contents which can ultimately weaken the stomach wall and result in ulcers or stomach inflammation (Bagas, 2016). Meanwhile, consuming very spicy or sour foods can stimulate the digestive system. If this condition continues, there will be excess acid which will irritate the mucosal walls of the stomach and trigger symptoms of gastritis (Smeltzer, 2013). The incidence of gastritis and diet are closely related because teenagers who have poor diets are more likely to get gastritis than teenagers who have healthy diets (Diliyana & Uitami, 2020). The worse the diet, the greater the risk of gastritis, and vice versa, if the diet is good the incidence of gastritis will decrease (Amri, 2020).

### **Relationship between Stress and Gastritis Symptoms of Respondents**

The results of this study show that there is a relationship between stress and symptoms of gastritis in adolescents at the Integrated Agricultural Vocational School, Riau Province, with the p value found = 0.000 which means p value < a 0.05. The results of this research are in line with research by Ardawilly et al., (2023) which explains that there is a relationship between stress levels and gastritis in grade 8 teenagers at SMPN 1 Pakuhaji. Stress can produce stomach acid and gastrointestinal motility, so psychomotor and digestive system disorders in someone who experiences stress are closely related to the emergence of disorders in the digestive system that are related to stress and a person's psychology. This is because the brain's nervous system is connected to the stomach, so stress can have an impact on the stomach and cause abnormalities. In this case, an imbalance may arise which will lead to symptoms of gastritis (Aritonang, 2021). Through neuroendocrine mechanisms, stress has an adverse effect on the digestive system, increasing the hormone cortisol, which in turn causes gastric secretory activity (pepsin and HCl), increasing the possibility of gastritis (Price & Wislon, 2012). According to Davison et al., (2016) there are four categories that can be divided into indicators or symptoms of stress, namely behavior, feelings, thoughts and impacts (on the body). According to Rasmun (2014) severe stress is defined as stress that has the potential to cause chronic physical illness. Stress can cause the mouth to dry out and produce less saliva. This can cause uncontrolled contractions of the esophageal muscles, which can cause difficulty swallowing and increased stomach acid (Saroinsong et al., 2017). In line with research by Hastuti & Baiti (2019), teenagers with mild stress sometimes experience several symptoms,

namely being sensitive to a situation, anxious, impatient when experiencing delays and sometimes easily feeling restless. Recurrence of gastritis in teenagers who experience mild stress is usually caused because when they are stressed, some teenage boys actually divert their stress by drinking alcohol, smoking and so on which can trigger an increase in stomach acid, whereas in teenage girls they usually only focus on the pressure they are experiencing so that forget meal times. Prevent and avoid stress so that it doesn't cause recurrence in teenagers who experience busyness or environmental pressure by paying attention to lifestyle patterns, such as adequate rest, regular exercise and eating patterns, by doing this the body will become more relaxed and can reduce excess adrenaline hormones. Based on the information above, it can be concluded that in stressful situations, for example panic, piling up tasks or workloads, without teenagers realizing it, there is a severe level of stress which is very likely to cause stomach acid production to increase. Excessive gastric acid production results from an imbalance between the resistance of the mucosa, thereby irritating the lining of the stomach wall.

## **CONCLUSION**

Based on research that has been conducted, it was found that there is a significant relationship between diet and stress and gastritis symptoms. It is hoped that the results of this research can add new knowledge and reference sources in developing interventions to improve eating patterns and control stress and prevent symptoms of gastritis in adolescents. It is hoped that future researchers can develop the results of this research further regarding other factors that can influence gastritis in adolescents. The authors acknowledge the contribution of the One Stop Investment and Integrated Services Service and the Riau Province Integrated Agricultural Vocational School for providing permission and support to ensure the research process runs smoothly until completion. We would also like to thank all students of the Integrated Agricultural Vocational School, Riau Province, who were willing to be respondents in this research.

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