

Literature Review: The Relationship between Eating Habits and Dyspepsia in Adolescents

Kajian Literatur: Hubungan Kebiasaan Makan dengan Kejadian Dispepsia pada Remaja

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ABSTRACT

Background: All over the world the prevalence of dyspepsia is quite high. Various literature sources in western countries show that the prevalence of dyspepsia is in the range of 7-41% in 2009, but unfortunately only about 10-20% of patients seek treatment or medical help. The increasing condition of dyspepsia can cause various health problems such as decreasing quality of life and functional activity. Dyspepsia usually affects those of productive age.

Objectives: This article was produced with the intention of examining the association between eating behaviors and the prevalence of dyspepsia in adolescents.

Methods: This is a qualitative article written using a literature study through searches on Google, Google Scholar and Research Gate with the keywords "Eating Patterns and Dyspepsia", "Types and Frequency of Eating and Dyspepsia", and "Risk Factors for Dyspepsia". The resulting articles were selected using the PRISMA flowchart.

Results: There are still many teenagers who do not take care of their own health. Teenagers who still live with their parents sometimes still don't care about their health. Adolescents' eating habits, such as eating irregularly or experimenting with an unbalanced diet that is not recommended by health professionals, can lead to unfulfilled nutritional needs.

Conclusions: Today's lifestyle of teenagers influences their eating habits. Teenagers who are preoccupied with schoolwork and other activities often delay eating or apply the wrong diet, which if left unchecked can trigger dyspepsia. There is a need for repeated education about the importance of fulfilling nutritional intake through regular eating habits to reduce dyspeptic symptoms.

INTRODUCTION

In a number of nations, including Indonesia, non-communicable diseases have recently emerged as a leading source of morbidity and mortality. In the world, including the SEARO (South East Asian Regional Office) countries, according to WHO 2020 noncommunicable diseases (NCDs) kill 41 million people each year, equivalent to 74% of all deaths globally. Of all NCD deaths, 77% are in low and middle-income countries¹. Based on 2015 data from the World Health Organization (WHO), 13-40% of the total population suffers from dyspepsia each year. Dyspepsia is ranked 10th with a proportion of 1.5% for the 10 largest types of disease in outpatients in all hospitals in Indonesia². Dyspepsia is a collection of symptoms (syndrome) consisting of nausea, vomiting, early satiety, bloating, feeling of fullness, belching, pain or discomfort in the stomach and heat that radiates to the chest³.

All over the world the prevalence of dyspepsia is quite high. Various literature sources in western countries show that the prevalence of dyspepsia is in the range of 7-41% in 2009, but unfortunately only about 10-20% of patients seek treatment or medical help. Every year the trend of dyspepsia cases reaches 10%, with new incidents in health services ranging from 5-7%⁴. Dyspepsia comes from the Greek words "dys" which means bad and "peptin" which means digestion⁵. Dyspepsia is a number of syndromes or groups of symptoms related to discomfort or pain in the pit of the stomach, feeling full quickly when eating, flatulence, vomiting, nausea and stomach feeling full or full. This has an impact on digestive imbalances or body metabolism which triggers biochemical reactions in the body, including those related to nutritional needs⁶.

The increasing condition of dyspepsia can cause various health problems such as decreasing quality of life

and functional activity. Dyspepsia usually affects those of productive age. Most of the causes of dyspepsia are unhealthy eating patterns and lifestyles⁷. Modern lifestyles can more or less influence the occurrence of dyspepsia, such as fatty foods, smoking and NSAIDs⁸. In Indonesia, health problems include non-communicable diseases and communicable diseases. One of the non-communicable diseases is caused by diet changes and lifestyle. One of the factors for dyspepsia is poor eating patterns or diets⁹.

Poor eating habits can cause various diseases due to unbalanced food consumption in the body. These eating habits are related to meal times. Several factors that trigger excessive stomach acid production are alcohol, painkillers, vinegar, acidic foods and drinks, spicy foods and stimulating spices. All of these trigger factors can cause dyspepsia¹⁰.

There are two factors that affect a person's eating habits, namely external and internal factors. External factors include daily activities such as socio-cultural activities, parental education, family economic level, and working and studying during school and university years. While the internal factors that can affect eating habits are BMI, age, gender, knowledge and beliefs. The purpose of

this study was to examine the relationship between eating habits and dyspepsia. The authors were interested in researching eating habits because of its relation to dyspepsia.

One group that has a risk of dyspepsia syndrome is adolescents⁷. The high incidence of dyspepsia in adolescents occurs due to eating patterns that are mostly less regular¹⁰. Adolescents' daily activities, such as the many assignments at school or campus, also affect their eating patterns. This has an impact on the eating habits of teenagers, where they often delay meal times and even forget to eat¹¹.

METHODS

The literature review approach and a qualitative research methodology were used to write it. Analysis of books, magazine articles, and other relevant materials was done in the development of this work. When the term "literature review" is used here, it refers to research activities that have as their goal the analysis of multiple books and other relevant material in order to address the current research issue. The following is a chart of research methods that will be carried out:

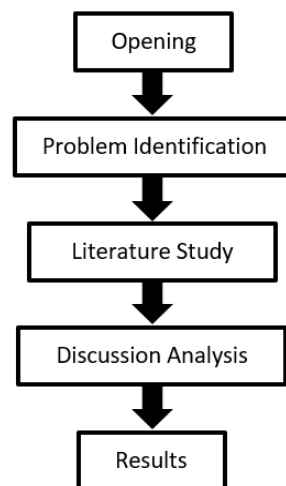


Figure 1. Sources of Thinking Framework (Rumetna, 2018)

This article is written descriptively or uses descriptive analysis based on several relevant articles. The first step in this research is to collect articles with relevant studies that have been published on Google Search, Google Scholar and Research Gate. Then an initial assessment is carried out regarding the objectives, methods, results, discussion and conclusions in a journal. The final step is to analyze the contents of each journal article and classify it into a table of research results. Relevant journals selected in the study were based on PICO criteria in which these criteria included Population (people with dyspepsia), Intervention (poor eating habits), Comparison (good eating habits), and Outcome (food recommendations for dyspepsia).

During the process of selecting articles from Google Search, Google Scholar and Research Gate, several similar articles were found. The same articles will be filtered again to avoid article similarities when a thorough discussion is carried out. Comparisons between articles were also made so that they could be discussed further and to strengthen the articles discussed, additional articles and books were included. The chosen publications make use of the flow chart for Preferred Reporting Items for Systematic Review and Meta-Analyses (PRISMA), which aids researchers in drawing conclusions about their studies.

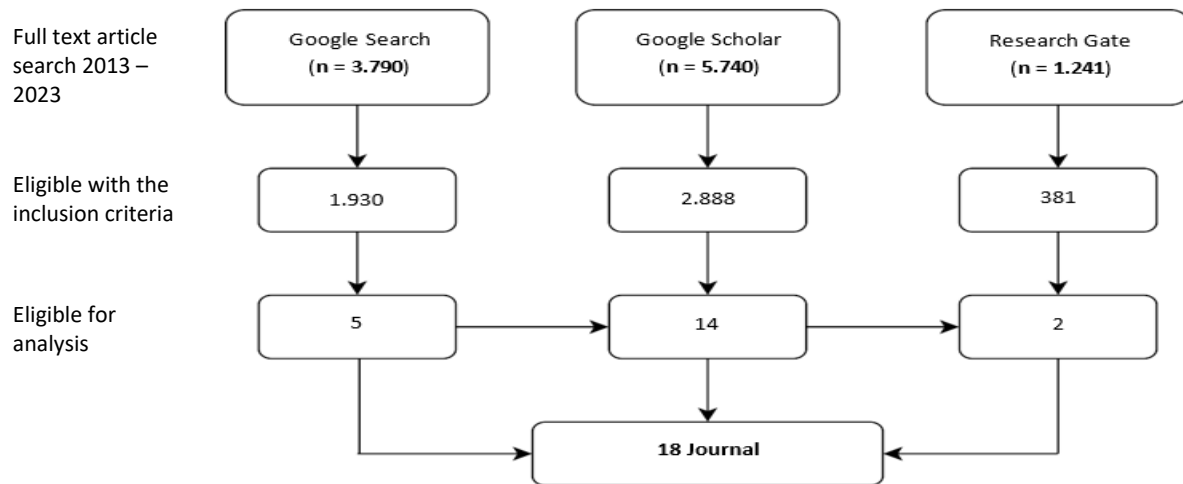


Figure 2. Article Selection Scheme

RESULTS AND DISCUSSION

Teenagers with bad eating habits will affect the learning process. The habit of consuming spicy and sour foods and consumption of tea, coffee and other carbonated drinks can trigger dyspepsia in adolescents. There are still many teenagers who do not take care of their own health. Teenagers who still live with their

parents sometimes still don't care about their health, especially those who live in boarding houses in other cities far from their parents' monitoring. Adolescents' daily life, such as eating irregularly or experimenting with an unbalanced diet that is not recommended by health professionals, can lead to unfulfilled nutritional needs.

Research Titles	Design	Population	Research Results	Research Conclusion	References
Diet Affects the Incidence of Dyspepsia Syndrome in Students of STIKES Graha Medika Kotamobagu	Cross-sectional research methods were used in this study, along with observational analysis. Random stratified sampling was the sampling method utilized. The chi-square test was used for univariate and bivariate analysis after the data were gathered through direct interviews with respondents using a questionnaire.	The population consisted of all current Graha Medika College of Health Sciences students, numbering up to 885, with a total sample size of 151 responses. Random stratified sampling was the sampling method utilized.	There was a connection between eating habits and the prevalence of dyspepsia syndrome in students at the Graha Medika College of Health Sciences ($p = 0.006$). According to reports, dyspepsia is linked to high-fat foods, hurried eating patterns, and irregular eating schedules	Eating behaviors and the dyspepsia condition were related.	3
Relationship Between Eating and Dyspepsia Syndrome in Preclinic Students Of The Faculty Of Medicine Nusa Cendana University	In this study, a cross-sectional analytic observational research strategy was used.	116 samples were collected through simple random sampling, which produced the sample.	From the results of the bivariate test in this study, using multiple linear regression tests, the results obtained were $p = 0.01$ and $r = 0.330$.	Pre-clinical students at the Faculty of Medicine, University of Nusa Cendana, Kupang, have a connection between diet and the dyspepsia syndrome.	2
The Relationship Between Stress Levels and Diet Patterns with The Incidences Of Dispepsia Syndrome In Eight Semester Nursing Students Of Universitas Aisyiyah Yogyakarta	Descriptive analytic cross-sectional observational methodology was utilized in the study. Questionnaires were employed as the research tool. Chi square analysis was used to examine the study's findings.	113 pupils were included in the simple random sampling procedure that was used to collect the samples.	Results of a chi square test indicated an association between stress levels and the dyspepsia syndrome with a p value of 0.000, while the analysis of diet test results and the dyspepsia syndrome yielded a p value of 0,002.	Stress levels and eating habits are related in people with dyspeptic syndrome. When it comes to maintaining food available when lunchtime occurs, students must create a meal schedule.	5
Relationship of Eating Regularity and Irritating Diet with Dyspepsia in Students of Medical Education Study Program Faculty of Medicine Sriwijaya University	This study used a cross-sectional observational analytical design. Stratified random sampling was the method of sampling that was employed. Direct interviews and a questionnaire were used to gather the information.	The Faculty of Medicine at Sriwijaya University in Palembang, Indonesia, was where this study was carried out. 147 pupils who qualified for inclusion and 73 additional respondents made up the total sample size of 151.	According to the results of the bivariate analysis, there was no significant association between an annoying diet and dyspepsia ($p=0.079$) and there was a significant relationship between eating regularly and dyspepsia ($p = 0.039$).	When it comes to students in Sriwijaya University's Medical Education Study Program, there is no significant correlation between an irritable diet and dyspepsia, but there is one between eating regularly and the condition.	4
Factors Related To The Occurrence Of Dyspepsia In Adolescents In The Work Area Of The Krueng Barona Jaya Aceh Besar	This study uses a cross-sectional study design and is descriptive in nature. Accidental sampling is the	38 adolescents who visited the Krueng Barona Jaya Health Center during the month of June 2019 comprised the study's	The findings demonstrated a correlation between stress (p -value 0.033), regularity of eating (p -value 0.004), and irritable foods and beverages (p -value 0.024) and the	For teenagers, it is advised that they create a meal plan, keep food on hand whenever mealtime comes, or always carry snacks with them. They should also pay attention to regular mealtimes (right), choose	3

Research Titles	Design	Population	Research Results	Research Conclusion	References
Regency Health Center In 2019	method of sample collecting.	population, making up a total sample size of 38 people.	occurrence of dyspepsia in adolescents.	adequate, varied food and refrain from consuming spicy, sour, or soft drinks.	
Disorders of eating patterns and the incidence of dyspepsia in adolescents	Cross-sectional study methodology was used in this investigation, which employed an observational analytical research design. Purposive sampling was used to obtain the sample, and a Google form was used to collect the data. The questionnaire had a total of 26 questions. The technique combined a Chi-square test with univariate and bivariate data.	From a total population of 89 individuals, 47 instances were used.	According to the analysis's findings, 53.2% of the respondents reported erratic eating habits. 72.3 percent of respondents, or the majority, reported having dyspepsia syndrome. (p = 0.001) There is a connection between eating disorders and dyspepsia volume.	According to the findings of the Rancaekek Public Health Center, there is a connection between eating disorders and dyspepsia syndrome.	1
Correlation between Irritative Diet and Eating Irregularities with Dyspepsia Syndrome in Adolescents of Madrasah Aliyah Al- Aziziyah Putri Kapek Gunungsari, West Lombok, West Nusa Tenggara	This research is non-experimental and designed analytically using the cross-sectional method. using proportionate stratified sampling techniques. Data obtained through a questionnaire that has been filled out by respondents The statistical test used is the chi-square test.	The research respondents were 202 young women aged 10–19.	The chi square test revealed no correlation between an irritable diet and the likelihood of developing dyspepsia syndrome (p = 0.239), and no correlation between disordered eating and the likelihood of developing dyspepsia syndrome (p = 0.216).	Sixty percent of people have dyspepsia syndrome. There is no connection between a picky eating style and eating disorders and the prevalence of dyspepsia syndrome among young.	6
Differences in Stress Levels, Eating Regularity, and Dyspepsia Syndrome in Dormitory and Non-Dormitory Students at Samarinda Health Vocational School	This study used a cross-sectional analytical observational design. The results of the investigation were analyzed using the Mann Whitney and Chi-Square tests.	84 students, including 42 dorm residents and 42 non-residents, served as the research subjects.	The majority of dyspepsia syndrome cases among students living in dorms involved 30 students (71.4%). Comparative test findings revealed p= 0.034 for stress level, p= 0.003 for eating frequency, and p= 0.000 for the prevalence of dyspepsia syndrome.	At Health Vocational School Samarinda, there were disparities between dorm students and non-dorm students in terms of stress levels, eating habits, and the prevalence of dyspepsia syndrome.	5
Relationship Between Diet and Dyspepsia Syndrome in Class XI Students at SMA Negeri 1 Manado	Analytic cross-sectional research is being used here. Using the Chi Square statistical test, analyze the data.	220 students who satisfied the qualifications and had previously signed the contract made up the total number of respondents in the survey.	Analysis of the data reveals a value of 0,009 probability less than 0,05. It denotes a connection between a diet and the occurrence of dyspepsia due to the Genesis	Researchers' and school participant respondents' advice to be more disciplined in meal planning and management for school may pay more attention to more students' eating habits to maintain health is actively, especially during break time, let all	12

Research Titles	Design	Population	Research Results	Research Conclusion	References
			syndrome in Class XI students at SMA Negeri 1 Manado.	students be able to organize the best possible time to eat.	
The Relationship between Diet and Stress with the Incidence of Dyspepsia in Students at SMP Negeri 2 Karang Intan	This study sought to ascertain how pupils at State Junior High School 2 Karang Intan's eating habits and levels of stress were related to the prevalence of dyspepsia. In this quantitative analysis, a cross-sectional study design was adopted.	56 individuals made up the samples.	The findings revealed that 21 persons (80.8%) and 56 people (55,4%) respectively met the criteria for dyspepsia and stress, respectively, with p-values of 0.001 and 0.05, respectively.	Where the value of p is 0.001 (p 0.05), there is a link between stress and dyspepsia. There is a connection between irregular eating habits and the prevalence of dyspepsia (p = 0.001) and p 0.05, respectively.	2
The Relationship Between Eating and The Incidence of Functional Dyspepsia In Students Of The Faculty Of Medicine, Uisu, Class Of 2018	Analytical research using a cross-sectional study design is the method used.	To ascertain the connection between nutrition and the prevalence of functional dyspepsia among 2018 UISU medical school graduates.	The chi-square correlation test is used in this investigation with a p value of 0.001 (p 0.05). According to these findings, diet and functional dyspepsia are significantly correlated.	Students can recognize the trigger factors for dyspepsia so they can take steps. prevention of promotive and preventive dyspepsia activities. There is a positive relationship between irregular eating patterns and the incidence of dyspepsia syndrome.	1
Differences in Stress Levels, Eating Regularity, and Dyspepsia Syndrome in Dormitory and Non-Dormitory Students at Samarinda Health Vocational School	This study used a cross-sectional analytical observational design. The results of the investigation were analyzed using the Mann Whitney and Chi-Square tests.	84 students, including 42 dorm residents and 42 non-residents, served as the research subjects.	The majority of dyspepsia syndrome cases among students living in dorms involved 30 students (71.4%). Comparative test findings revealed p= 0.034 for stress level, p= 0.003 for eating frequency, and p= 0.000 for the prevalence of dyspepsia syndrome.	At Health Vocational School Samarinda, there were disparities between dorm students and non-dorm students in terms of stress levels, eating habits, and the prevalence of dyspepsia syndrome.	5
Relationship between diet and dyspeptic syndrome in adolescents at the Mawaridussalam Islamic Boarding School, Batang Kuis District, Deli Serdang Regency	This cross-sectional study were chosen by simple random sampling. Questionnaire sheets were used to gather the data, which were then analyzed using bivariate and univariate analysis.	83 participants	Additionally, it was discovered that among adolescent students at the Mawaridussalam Islamic boarding school in the Batang Kuis District of the Deli Serdang Regency, 54,2% of respondents had a poor diet pattern and 54,2% had dyspepsia syndrome, affecting 45 individuals.	Eating habits and the likelihood of developing dyspepsia syndrome are linked, especially when it comes to bad eating habits, which account for up to 54.2% of cases. Adolescents with busy schedules are more likely to suffer from dyspepsia. The prevalence of dyspepsia syndrome is positively correlated with irregular eating habits.	1
The Relationship between Individual Characteristics, Diet, and Stress with the Incidence of Dyspepsia in Students of the Medical Study Program at Jambi University Class of 2018	This study used a cross sectional analytic observational design. the sample was taken using the total sampling method. A questionnaire that was circulated via Google Forms	The population is the 138 students enrolled in the medical study program at Jambi University in 2018.	The study looked at the connections between stress and dyspepsia (p=0.005) and eating regularly (p=0.005).	The habit of consuming irritable foods	1

Research Titles	Design	Population	Research Results	Research Conclusion	References
	served as the study instrument.				
The Relationship Between Eating Disorders and Consumption Patterns Of High-Fat Food With the Incidence of Functional Dyspepsia Syndrome In Adolescent Women In City High School Yogyakarta	Analytic cross-sectional research methodology is used. The respondents were asked to complete questionnaires on eating disorders, SF-NDI, and FFQ-SQ. The variable was statistically examined using the chi-square test.	106 teenage females who attended Yogyakarta's senior high school met the inclusion requirements were the subjects.	There is a significant relationship between eating disorders and the food consumption of high fat patterns with functional dyspepsia syndrome, according to the results of the chi-square test, which showed PR 2,655 (CI=1.725-4.088) for eating disorders and p=0,001; PR 1,407 (CI=1.028- 5.1.926) for eating patterns high in fat.	Among adolescent girls attending Yogyakarta's senior high school, there is a substantial correlation between eating disorders and high-fat eating habits and the functional dyspepsia syndrome.	2
Relationship between Dyspepsia Syndrome, Dietary Habbit, Intake, and Gender among Students at The Faculty of Medicine Ukrida 2013	This cross-sectional study were chosen by simple random sampling. Bivariate and univariate analyses were performed on the data.	97 participants at the medical school of Krida Wacana Christian University, this study was carried out.	According to this study's findings regarding the relationship between dietary habits and functional dyspepsia syndrome, there were 42 respondents (79.2%) with irregular dietary habits who were diagnosed with the condition, compared to 14 individuals (31.8%) with regular dietary habits.	Functional dyspepsia syndrome was significantly correlated with eating habits and sexual behavior among the class of 2013 students (p 0.001).	11
Relation Between Stress and Eating Habit with Dyspepsia on the 1st Degree Class of 2018 Preclinical Students of Medical Faculty of Hasanuddin University	This research is observational study because in collecting the data and information without doing any intervention or treatment to the respondent. While the type of research is analytical study because in doing the study we purpose to do analysis about the relation between stress and eating habits with the event of dyspepsia.	195 students were selected in this study.	Based on the result of study from respondents with habit to consume spicy, acid, and hot meals with total 78 respondents then the respondents with regular eating habit and seldom/not consuming spicy, acid, and hot meals total 120 respondents, with not-stressful total 121 respondents. For dyspepsia, respondent with dyspepsia indication is about 56 respondents and respondents without dyspepsia indication is 142 respondents.	1) there is relation between stress with Dyspepsia 2) there is relation between eating habit with Dyspepsia.	8
Correlation between Not Breakfast and Types of Food and Drinks that Trigger Gastric Acid and Dyspepsia in Adolescents Aged 15–19 Years in Bangkinang Village	This kind of study uses a cross-sectional research design and descriptive correlation. By showing the sample using straightforward random sampling.	488 adolescents living in Bangkinang Village between the ages of 15 and 19 comprised the study's population.	The Chi-Square test revealed a correlation between not eating breakfast, the kinds of foods and beverages that cause stomach acid to release, and the prevalence of dyspepsia (p = 0.001).	There is a relationship between not having breakfast and the incidence of dyspepsia in adolescents aged 15–19 years in Bangkinang Village in 2022. There is a relationship between the types of food and drinks that trigger stomach acid and the incidence of dyspepsia in adolescents aged 15–19 years in Bangkinang Village in 2022.	1

Research Titles	Design	Population	Research Results	Research Conclusion	References
The Relationship between Type and Frequency of Eating with Suspected Dyspepsia in UNJA Undergraduate Nursing Students	Cross sectional quantitative correlational research is used in this study. The tools utilized were a suspect dyspepsia questionnaire via Google Form and a questionnaire on the type and frequency of eating. Chi Square data analysis.	Employing 106 samples in total as part of the sampling process.	There is a substantial correlation between the kind and frequency of eating and the number of suspect dyspepsia among Sarjana Degree Nursing Students at Jambi University, according to the study's findings on type and frequency of eating, which had p-values of 0.000 and 0,023 0,05.	Apart from the type and frequency of eating, there are still many other factors causing suspect dyspepsia, such as the environment, stress, socioeconomic problems, the influence of residence, and lifestyle, which may contribute to the suspect dyspepsia rate but were not examined in this study. For that reason, it is hoped that the researcher will be able to dig deeper into other factors that cause dyspepsia.	1

According to Santoso (2017), adolescents, whether they have good or poor knowledge, can still have eating and drinking behaviors that can cause dyspepsia. The information that each teenager receives through social media greatly influences their mindset in choosing good and right food so that it can reduce the risk of dyspepsia in adolescents¹². Regular eating habits are very useful for gastric acid secretion because in these conditions it can make it easier for the stomach to recognize eating patterns. In the end, stomach acid production can be controlled properly. Meanwhile, irregular eating habits can cause stomach acid to be difficult to control properly. Irregular eating habits that last a long time will cause excessive stomach acid production which causes gastritis and can progress to peptic ulcers¹¹.

According to Kefi's research findings (2022), foods and drinks that have gas and are acidic usually contain a low pH of around 3-4. Caffeine, which is becoming a trending drink among today's teenagers, contains gas which causes stomach acid to rise. The mechanism by which caffeine can increase GAS (Gastric Acid Secretion) is suspected from the nature of caffeine as a bitter alkaloid. This bitter taste will induce binding to the bitter receptors in the body, namely TAS2R (Type 2 Bitter Receptor). TAS2R is located in the oral cavity and in the stomach. TAS2R activation in the oral cavity will stimulate the cephalic phase excessively, thereby increasing gastric acid production, whereas the binding of TAS2R with caffeine that occurs in the stomach will overstimulate enteroendocrine G cells. This will cause the G cells to overproduce the hormone gastrin, which results in excess gastric acid secretion due to the binding of gastrin to the gastric parietal cells¹³.

This will cause irritation to the stomach and make it feel bloated every time one consumes caffeine. One of the secretagogue substances found in caffeine is one of the causes of the antrum of the gastric mucosa to secrete the hormone gastrin. The hormone gastrin that comes out of stomach acid can cause very acidic gastric juice. The caffeine content in coffee can stimulate the central liden system which can increase stomach acid activity so that the stomach will become very acidic which results in vulnerability to irritation of the gastric mucosa¹³.

The habit of eating in a hurry can cause more stomach acid production than usual. Fatty foods such as fried foods are foods that are difficult to digest, and sweet foods can also cause hypersecretion of stomach acid. The habit of eating spicy food more than 1 time per week for at least 6 months can cause stomach irritation¹⁴. Modern lifestyles, such as consuming irritative drinks and fatty foods such as *seblak*, spicy macaroni and *ayam geprek* with too much chili, and excessive amounts of carbonated drinks such as lemon tea can also trigger symptoms of dyspepsia¹⁵.

According to research findings by Annisa, 2009 in Suzanni, 2019, a good frequency of eating is 3 times a day, interspersed with snacks between main meals. Irregular eating frequency, meal intervals and the number of meals that are not according to daily needs if done continuously will cause stomach acid production to increase and cause complaints such as nausea¹⁶. Irregular eating patterns can be the forerunner of various diseases due to

insufficient food intake. Irregular eating is closely related to meal times, where individuals sometimes feel too hungry or too full, resulting in an unfavorable stomach condition and dyspepsia¹⁷.

According to Nugraha (2020) the ideal time for stomach emptying is usually around 3-4 hours and the right main meal hours are around 4-5 hours. A good eating pattern is 5-6 times a day consisting of breakfast, snacks, followed by lunch¹⁸, then afternoon snacks and dinner, and if necessary evening snacks can be added¹⁹. Several factors that cause dyspepsia are gender and age. Gender is a factor that causes dyspepsia because the action of the gastrin hormone can cause additional flow in the stomach and make the stomach very acidic. Therefore, more women suffer from dyspepsia than men²⁰.

Women have a higher risk of experiencing dyspepsia than men because women usually try to maintain an ideal body weight and are usually afraid of getting fat. In addition, women are also more emotional and their hormones are more reactive than men so that when faced with many problems or protracted thoughts, their stomach acid easily increases. Having the wrong body image such as being afraid of looking too thin or fat, results in women. This behavior can be dangerous and at risk of causing diseases related to the digestive system¹⁸.

According to Nasution (2015), digestion of food be related to gastrointestinal function where it has the potential to become pathological causing dyspepsia²¹. Fat is also known to have a slowing effect on gastric mobility through stimulation of enteric hormones such as cholecystokinin²². According to Feinle (2013), some dyspepsia patients have identified certain foods as triggers for the symptoms, but they still often do not follow recommendations or adjust their behavior to improve the symptoms so that there is no difference between functional dyspepsia patients and healthy individuals²³.

Further research is needed regarding dietary factors as a trigger for dyspepsia. Dietary factors are relatively new to be discovered in evidence-based research. Lack of awareness and education related to dyspepsia might exacerbate the symptoms experienced. This can be the background of the incidence of dyspepsia²⁴. According to Pasaribu (2014), teenagers who live at home with their families, where each individual is busy with work, especially with working mothers, usually eat alone and rarely have a meal together at home²⁵.

The same thing was also found in Surjadi's research (2013), that students who do not live with their parents or family often have late meals or a bad eating schedule due to busy assignments and student activities²⁶. This is because students prepare their food independently. Changes in the environment like that can change daily habits, where those who initially eat regularly often eat late, which eventually causes irregular eating patterns and lifestyle changes²¹.

Gastric acid fluid functions to digest food that enters the stomach and turns food into a viscous mass (chyme). Gastric acid is also irritating and acidic, and the acidic atmosphere in the stomach is useful for killing microorganisms that enter with food²¹. The Samarinda Health Vocational School has a difference in the

prevalence of dyspepsia syndrome between students who live in dorms and those who do not, according to Hidayat's research findings (2019). The incidence of dyspepsia syndrome is more common in dormitory students than non-dormitory students²⁷. Based on Djojoningrat's presentation (2015), stress levels and eating patterns are factors in the occurrence of dyspepsia syndrome²⁸.

According to the findings of Sorongan study (2013), 61.4% of Manado State Senior High School students have irregular eating patterns and the percentage of dyspepsia syndrome is quite high. Complaints that are commonly felt by students are epigastric pain. The results of the research conducted showed a relationship between diet and dyspepsia syndrome in students²⁹.

Stress is one of the trigger factors for dyspepsia. Stress experienced by individuals can cause excessive anxiety, and this is very closely related to lifestyle. Disturbed thoughts due to many tasks and fatigue from daily activities can cause anxiety. Anxiety disorders can cause a variety of physiological responses, one of which is digestive disorders. According to Hidayat, 2009 in Oktaviana, 2021 stress is a physical and psychological reaction from every demand in life that will cause tension and disrupt the stability of everyday life³⁰.

According to Oktaviana's research findings (2021), the high rate of possible stress is caused by digestive disorders such as pain in the pit of the stomach or discomfort in the stomach both after eating and before eating³⁰. According to Thoriq's research findings (2018), if someone eats about 2-3 hours late or even more, the production of stomach acid will increase so that it can cause dyspepsia. This causes a person to often experience pain in the stomach and feel nauseous. Students should maintain the frequency of main meals at least 3 times a day and snacks 2 times a day by making a good eating schedule and always bringing food or snacks with them for when meal time arrives³¹.

According to Putri's research findings (2022), female respondents have a 1.066 times the risk of experiencing dyspepsia compared to male respondents³². According to Jayabaya 2011 in Putri 2022, women are more likely to go on a diet by reducing food portions which results in frequent nausea, vomiting and stomach pain, and respondents who live in rented or boarding houses have a 1.226 times the risk of experiencing dyspepsia compared to respondents who live with their families³². According to Arisman 2008 in Fikrinisa 2018, the busyness of teenagers causes changes in eating habits. Usually teenagers choose to eat out or only consume snacks. Then anxiety over body shape makes teenagers deliberately not eat in order to maintain an ideal body. This can trigger dyspepsia in adolescents³³.

According to the findings of Li's 2013 study in Tiana 2017 about the description of students in Zheijiang province of China, it was found that dyspepsia syndrome occurs more frequently in women (about 7.54%) than men (about 4.14%)²⁰. According to Puteri's research findings (2022), adolescents who have experienced dyspepsia or who are experiencing it are affected by the same factors, such as frequently consuming foods that trigger acid and rarely eating breakfast. Most teenagers

are preoccupied with various activities in addition to studying. Usually a teenager who focuses on his/her activities tends to feel compelled to complete these activities and forgets to think about his/her health³⁴.

Previous research reported that coffee consumption is likely to cause dyspepsia. Gastric acid secretion is caused by compounds in coffee such as chlorogenic acid and caffeine. According to related studies, lipids control activities of the upper digestive tract such gastric emptying and promote pancreas and acid secretion. The impression of the stomach and the development of dyspeptic symptoms may both be influenced by fats that release cholecystokinin (CCK). Consuming fat stimulates and increases the release of gastrointestinal hormones like polypeptide Y, glucagon-like peptide-1 (GLP-1), and CCK. This demonstrates how peptides control stomach emptying and can cause dyspepsia³⁵.

Capsaicin is a component of spicy foods like chilies. Chili itself has a double effect with the first activation of sensitivity C-afferent fibers which can increase and at the same time reduce dyspepsia symptoms. A randomized study of 30 patients in 2 groups showed that oral supplementation with red chili powder 2.5 grams for 5 weeks resulted in a significant reduction in overall dyspepsia symptoms and gastric pain or fullness. Two patients from the red pepper group had to stop taking the supplement because of increased pain in the abdomen³⁵.

CONCLUSIONS

There is a relationship between bad eating habits and dyspepsia. Bad eating habits include irregular food patterns, consumption of foods that contain excessive gas (carbonated), acidic, fatty, sweet, spicy, and stressful. Today's lifestyle of teenagers influences their eating habits. Teenagers who are preoccupied with schoolwork and other activities often delay eating or apply the wrong diet, which if left unchecked can trigger dyspepsia. Therefore it is necessary to have appropriate treatment to prevent and reduce the occurrence of dyspepsia in adolescents. Good eating habits are a good first step in the treatment and prevention of dyspepsia syndrome. On the other hand, poor eating habits can exacerbate dyspepsia.

There are 3 main components in a diet, namely the type, frequency and amount of food. A balanced nutrition menu is a variety of foods to meet the nutritional needs in PUGS or the General Guidelines for Balanced Nutrition. There is a need for repeated education about the importance of fulfilling nutritional intake through regular eating habits to reduce dyspeptic symptoms among adolescents who have experienced dyspepsia or are currently experiencing dyspepsia.

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