

ANALYSIS OF THE RELATIONSHIP BETWEEN GASTROESOPHAGEAL REFLUX DISEASE (GERD) AND PATIENTS SMOKING PATTERNS AND COFFEE CONSUMPTION

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Abstrak

Tujuan dari penelitian ini adalah untuk menyelidiki hubungan antara minum kopi, merokok, dan prevalensi gastroesophageal reflux disease (GERD) pada mahasiswa. Penelitian ini merupakan penelitian cross-sectional analitik observasional yang menggunakan metodologi kuantitatif. 200 peserta dipilih secara acak dari sampel acak dasar untuk melakukan penelitian ini. Dalam penelitian ini, temuan pemeriksaan chi-square yang dilakukan untuk menentukan hubungan antara asupan kopi dan terjadinya GERD menunjukkan adanya hubungan yang patut diperhatikan antara kedua variabel tersebut. Demikian pula, hasil uji chi-square yang dilakukan untuk menetapkan hubungan antara praktik merokok dan kejadian GERD menunjukkan hubungan yang signifikan antara keduanya. Dengan demikian dapat disimpulkan bahwa ada hubungan yang signifikan antara konsumsi kopi, kebiasaan merokok, dan kejadian GERD pada mahasiswa.

Kata kunci: Konsumsi Kopi, Merokok, Mahasiswa, GERD

Abstract

The aim of this study was to investigate the association between coffee drinking, smoking, and the prevalence of gastroesophageal reflux disease (GERD) in college students. This study is an observational analytic cross-sectional study that employs a quantitative methodology. 200 participants were chosen at random from a basic random sample in order to conduct this study. In this research, the findings of the chi-square examination conducted to determine the correlation between coffee intake and the occurrence of GERD revealed a noteworthy association between the two variables. Similarly, the results of the chi-square test conducted to establish the link between smoking practices and the incidence of GERD demonstrated a significant association between the two. Consequently, it can be inferred that there is a significant correlation between coffee consumption, smoking habits, and the incidence of GERD in college students.

Keywords: Coffee Consumption, Smoking, Student, GERD

INTRODUCTION

The medical condition known as gastroesophageal reflux disease (GERD) occurs when stomach acid flows back into the esophagus, resulting in a variety of symptoms. These symptoms include heartburn, discomfort or pain in the upper abdomen, difficulty swallowing, regurgitation of fluids, chest pains, hoarseness, coughing, and even asthma. It is estimated that approximately 20% of the world's population experiences GERD each year. GERD is caused by the backflow of stomach contents into the esophagus, pharynx, larynx, and airways, which leads to the development of symptoms such as heartburn, dysphagia, nausea, regurgitation, and a bitter taste in the mouth (Fujiwara et al., 2011). The onset of GERD is typically due to an imbalance between defensive and offensive factors, including the lower esophageal sphincter (LES), acid clearance mechanisms, and the resistance of the esophageal epithelium. In addition, the esophagogastric junction, which includes the LES and the adjacent crural diaphragm, plays a crucial role in preventing acid reflux. A high pressure zone (15–30 mm Hg), which is higher than the intra-gastric pressure at rest, is created when the LES closes. Esophagogastric junction function can be lowered by three different mechanisms: structural anomalies of the esophagogastric junction, transient relaxation of the LES, and decreased LES tone (Harrison et al., 2015).

The gullet is a gastrointestinal tube-shaped organ positioned behind the windpipe. It starts inferiorly to the laryngopharynx, descends through the neck, and enters the anterior mediastinum at the vertebral column. Afterwards, it passes through the diaphragm by means of an aperture called the esophageal hiatus and terminates at the hind part of the belly. The passage includes four layers that make up the gullet: mucosa, submucosa, muscularis, and adventitia. The upper third of the esophagus

is comprised of skeletal muscle, while the middle third is a combination of skeletal and smooth muscle (Jung, 2011). The bottom third is made up entirely of smooth muscle. At the ends of the esophagus, the muscle narrows and creates two rings: the upper esophageal sphincter (UES), which is composed of skeletal muscle, and the lower esophageal sphincter (LES), which is located near the heart and contains smooth muscle. The UES controls the movement of food from the pharynx to the esophagus, and the LES regulates the movement of food from the esophagus to the stomach (Kim et al., 2014).

According to the findings of a previous investigator, GERD is prevalent in various regions, with a frequency of 18.1-27.8% in North America, 23.0% in South America, 8.8-25.9% in Europe, 11.6% in Australia, 8.7-33.1% in the Middle East, and comparatively lower in East Asia, specifically at a rate of 2.5%–7.8%. The reported occurrence of GERD in Singapore is 10.5%. Epidemiological data on GERD in Indonesia indicates a GERD rate of 32.4% in dyspeptic patients undergoing endoscopic procedures. A survey conducted by the same researcher demonstrated that the prevalence of GERD among physicians in Indonesia was 27.4%, which is higher than the rate in Southeast Asia. According to the latest research, it was found that from year to year, there is an increase in the prevalence of GERD. Factors that trigger GERD are age over 50, obesity, alcohol consumption, stress and anxiety levels, coffee consumption, and smoking. Busy schedules, many lecture assignments, and academic loads are suspected to be factors that cause medical students to tend to stay up late, so they have a habit of consuming coffee. As many as 12.4% of students had a habit of consuming coffee regularly ($\geq 3x$ a week), and 59.6% of others had a habit of consuming coffee occasionally ($< 3x$ a week). One of the factors that triggers GERD in people who consume coffee is the caffeine content. Caffeine in coffee can weaken lower esophageal sphincter (LES) tone. This causes gastric acid reflux, which can irritate the esophageal mucosa. According to research conducted by previous researcher, coffee consumption can induce gastroesophageal reflux. There are studies that claim the reverse, as did one done by an earlier researcher who found no connection between drinking coffee and GERD (Rase et al., 2021).

Based on the GHPS (global health professional survey) in 2006, as many as 47.8% of Indonesian Medical Faculty students had smoked. In research conducted at one university in Indonesia, as many as 23.9% of medical faculty students had the habit of smoking. In addition, coffee consumption habits are often associated with smoking habits, both of which are risk factors for GERD (Setiati et al., 2014). It was discovered that individuals who consumed over one pack per day had an elevated likelihood of experiencing GERD, functional dyspepsia, and irritable bowel syndrome in contrast to those who consumed less than 1 pack per day. In another study, it was found that people who smoke have a higher chance of getting GERD than people who don't smoke (Sharma et al., 2018). It is suspected that nicotine in cigarettes can reduce lower esophageal sphincter pressure and interfere with esophageal clearance and salivary secretion. In addition, smoking habits can increase gastric HCL secretion and inhibit gastric emptying. These things are thought to cause smoking habits to trigger GERD (Syam et al., 2016).

METHOD

This study is an observational analytical cross-sectional study that employs a quantitative methodology. In this study, all college students made up the population. The sample of this study consisted of subjects who came from populations that met the inclusion and exclusion criteria and had agreed to informed consent. The number of respondents taken was 196, which was then rounded up to 200. The instrument used in this study was collecting quantitative data through filling out questionnaires. Respondents filled out their own questionnaires via the Google form that was distributed. Data retrieval begins with respondents filling out questionnaires via Google Forms, which are distributed in the form of questions that are easy for respondents to understand. The data that has been collected will be processed using the SPSS application, after which the data will be processed through the following stages: editing, coding, data entry, and data analysis. Researchers will carry out univariate analysis, namely describing the characteristics of the independent and dependent variables studied. The independent variables of this study were coffee consumption and degree of smoking, while the dependent variable of this study was the incidence of GERD. The results obtained will be presented using a distribution table, which contains the size of the study sample distribution in units of number and percent for each variable. The researcher will conduct a bivariate analysis between the independent and dependent variables to find a relationship between the two. Bivariate analysis will be

carried out with the Chi-Square test; if it does not meet the requirements, then the Fisher's Exact Test will be carried out.

RESULTS AND DISCUSSION

As per the results of data scrutiny concerning the occurrence of GERD in university scholars, 23% of participants suffered from the ailment, whereas 77% did not. As per the outcomes of data analysis concerning the extent of coffee intake among students, the proportion of respondents who consume coffee habitually, specifically 71%, is greater than the proportion of respondents who do not have a routine of consuming coffee habitually, specifically 29%. There are several reasons students consume coffee. The level of coffee consumption among medical students increased on exam days compared to normal days. In addition, the most common condition that causes medical students to consume coffee is when they have to study for exams (69.6%). The results of data analysis related to consumption frequency show that as many as 59.2% of respondents have an occasional coffee consumption frequency (1-6x/week), 22.5% of respondents rarely consume coffee (1-3x/month), and 18.3% of respondents have a frequency of coffee consumption every day. Respondents who consumed 0–2 cups or glasses of coffee per day were 90.1%, followed by 9.9% who consumed 3–4 cups or glasses per day of coffee, and no respondents chose the amount of consumption of coffee ≥ 5 cups per glass per day. Based on data related to the duration of coffee consumption among students, it was found that the majority of respondents (42.3%) had consumed coffee for 2-3 years, followed by another 39.4% for ≥ 4 years. The type of coffee most consumed by respondents was instant coffee with 59.2%, followed by pure coffee with 23.9%, and decaffeinated coffee with 16.9%. The coffee consumption level of students is 65% low, while the other 35% have a high coffee consumption level. These findings are consistent with earlier research on the association between coffee drinking and GERD in Jakarta residents, where up to 61.9% of participants had low levels of coffee consumption and 38.1% had high levels.

Based on the results of data analysis related to smoking habits among college students, it was found that 24% of respondents had smoking habits and the other 76% did not. 58% respondents used conventional cigarettes, while the other 41% used electronic cigarettes. In college students, the degree of smoking according to the Brinkman index obtained from this study was that of 14 smokers who used conventional cigarettes, all were light smokers. The results of bivariate analysis between smoking degrees according to the Brinkman index could not be carried out in this study because of all the respondents who smoked, all of them were light smokers. As for the degree of smoking among electronic cigarette users, out of 10 people who use electronic cigarettes, as many of 70% are light smokers, and 30% are heavy smokers. From the results of the analysis that has been done, in this study, female respondents experienced GERD more than men, namely 60% and 39%. In this study, there was no significant relationship between gender and the incidence of GERD in college students. 46 respondents who experienced GERD, 87% lived alone, and the other 13% lived with their parents. However, there is no association between residence and the prevalence of GERD ($p = 0.407$). Similar results were obtained by previous studies, where the majority of medical students lived in dormitories and there was no significant relationship between residence and the incidence of GERD in medical students. The analysis of the relationship between sex and place of residence for GERD in college students only serves as support for this study.

The statistical analysis findings revealed that there was a noteworthy correlation between the frequency of coffee intake and the occurrence of GERD among university scholars, with a significance value of $p=0.014$. These conclusions align with prior investigations, where there was a substantial correlation between the frequency of coffee intake and the incidence of GERD with a p value of 0.006. Regarding the type of coffee ingested and its association with GERD prevalence among college students, a noteworthy correlation was discovered with a p -value of 0.010. Based on the findings of the investigation, a significant correlation was found between the amount of coffee consumed on a daily basis and the incidence of GERD ($p=0.001$). With a p -value of 0.015, earlier studies carried out in India found a strong correlation between the prevalence of GERD in medical students and the daily consumption of more than three cups of coffee. Moreover, Martinucci et al.'s research on the correlation between the amount of coffee consumed every day and the incidence of GERD among university students in Italy yielded comparable results, with a value of $p=0.01$, signifying a significant correlation between the two.

In this investigation, there was no noteworthy correlation discovered between the consumption of coffee and other constituents and the frequency of GERD in university students, with a p value of 0.230. The findings of this study align with prior research on the association between tea and coffee and GERD, where there was no significant correlation between the intake of coffee with milk and sugar and the incidence of GERD. Smoking, on the other hand, has a significant correlation with the incidence of GERD in university students, with a value of $p = 0.000$. This study is consistent with earlier research that indicated a significant correlation between smoking and GERD with a p-value of 0.006 in medical students in India; there is a significant correlation between smoking and GERD among doctors in Indonesia with a p-value of 0.031, and individuals who smoke have a greater risk of developing GERD with an OR of 1.7 bicarbonate secretion in saliva, which lengthens the clearance of acid and decreases the neutralizing effect of saliva on acid in the esophagus. In college students, the occurrence of GERD is not significantly linked to the type of cigarette used. Since the nicotine content in regular and vape cigarettes differs, it is challenging to accurately determine nicotine levels and establish a correlation between the two. The degree of e-smoking in college students is not significantly related to GERD incidence, which is consistent with the earlier findings on the correlation between e-cigarettes and GERD. The p-value of >0.005 , which is 0.605, indicates no significant correlation between e-cigarettes and GERD. The liquid employed in e-cigarettes contains nicotine, which can lower LES pressure and lead to gastric content reflux into the esophagus.

CONCLUSION

The aim of this research was to determine the correlation among tobacco use, consumption of coffee, and the frequency of gastroesophageal reflux disease. The dependent variable in this study is gastroesophageal reflux disease, while the independent factors are smoking and coffee drinking. Respondents who filled out the questionnaire in this study were students. The highest number of respondents based on gender were women, namely 64%. The majority of respondents currently live in boarding houses, namely as many as 69%. The proportion of college students with GERD is 23%. There are 65% of students with low coffee consumption levels and 35% with high coffee consumption levels. 24% of college students smoke, while the remaining 76% do not. The prevalence of student GERD and coffee use are significantly correlated. Smoking has a considerable impact on the prevalence of GERD among college students. Avoiding one of the factors contributing to the occurrence of GERD, such as reducing coffee consumption and not smoking, Further research is needed on other GERD risk factors in college students. Conduct health promotion regarding GERD disease among students.

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