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Physical Activities, Stress Level, and Symptoms of Abdominal Discomfort among Islamic Students

Aktivitas Fisik, Tingkat Stres dan Gejala Ketidaknyamanan Perut pada Mahasiswa Islam

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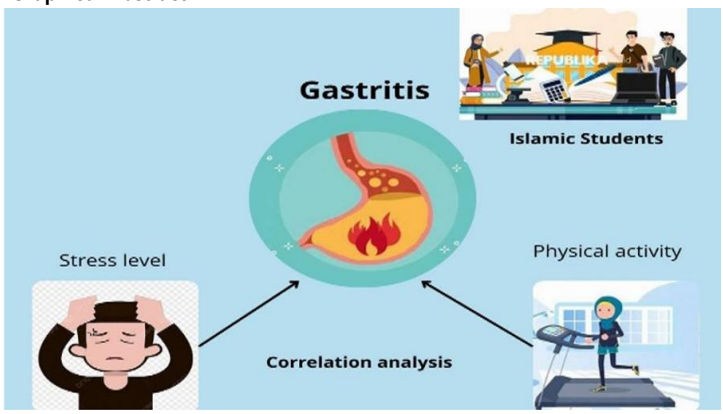
Abstract
The role of students as successors to the nation's aspirations for excellence and accomplishment is of great significance, particularly for the younger generation. The weight of this responsibility induces students to neglect their physical well-being, leading to the development of gastritis diseases. Hence, this study aims to investigate the factors that are correlated with the manifestation of gastritis symptoms. The objective of this study is to investigate the correlation between daily physical activity and stress levels with the manifestation of gastritis symptoms among enrolled students at the Islamic University in Makassar. This study examines the characteristics and experiences of college students through a cross-sectional approach. The data collection was facilitated through the use of an online questionnaire. A probabilistic sample method was employed, with a total of 401 respondents included in the study. The students conducted their studies at four universities in Makassar City that are affiliated with religious institutions. The statistical analysis of the data using Spearmen's test showed that there was no statistically significant association between daily physical activity and gastritis symptoms (p value 0.074). However, a significant relationship was observed between stress levels and gastritis symptoms among Islamic students in Makassar City (p value 0.000). The findings of this investigation demonstrated a statistically significant correlation between levels of stress and the manifestation of symptoms associated with gastritis. This study proposes that the implementation of effective stress management strategies among university students is crucial in reducing the occurrence of gastritis symptoms and promoting future academic success and overall well-being.

Abstrak
Peran mahasiswa sebagai penerus cita-cita bangsa untuk berprestasi dan berprestasi sangatlah penting, khususnya bagi generasi muda. Beratnya tanggung jawab ini menyebabkan siswa mengabaikan kesejahteraan fisiknya, sehingga berujung pada berkembangnya penyakit maag. Oleh karena itu, penelitian ini bertujuan untuk mengetahui faktor-faktor yang berhubungan dengan manifestasi gejala maag. Tujuan dari penelitian ini adalah untuk mengetahui hubungan antara aktivitas fisik sehari-hari dan tingkat stres dengan manifestasi gejala maag pada mahasiswa Universitas Islam Makassar. Penelitian ini mengkaji karakteristik dan pengalaman mahasiswa di Kota Makassar yang terletak di provinsi Sulawesi Selatan Indonesia melalui pendekatan cross-sectional. Pengumpulan data difasilitasi melalui penggunaan kuesioner online. Metode sampel probabilistik digunakan, dengan total 401 responden yang dilibatkan dalam penelitian ini. Para mahasiswa tersebut menempuh studi di empat universitas di Kota Makassar yang berafiliasi dengan lembaga keagamaan. Analisis statistik data menggunakan uji Spearmen menunjukkan bahwa tidak ada hubungan yang signifikan secara statistik antara aktivitas fisik sehari-hari dan gejala maag (p value 0,074). Namun terdapat hubungan yang signifikan antara tingkat stres dan gejala maag pada santri di Kota Makassar (p value 0,000). Temuan penyelidikan ini menunjukkan korelasi yang signifikan secara statistik antara tingkat stres dan manifestasi gejala yang berhubungan dengan maag. Studi ini mengusulkan bahwa penerapan strategi manajemen stres yang efektif di kalangan mahasiswa sangat penting dalam mengurangi terjadinya gejala maag dan meningkatkan kesuksesan akademis di masa depan dan kesejahteraan secara keseluruhan

Graphical Abstract



Keyword
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INTRODUCTION

National development efforts in the health sector (MDGs) are to improve the welfare of the Indonesian people. Likewise, in the SDGs, the goal is towards a healthy Indonesia by 2030 with a target of reducing by one third the death rate due to non-communicable diseases. However, in reality the number of non-communicable diseases is still quite high, one of which is gastritis. Gastritis is very dangerous if it is not followed up early, because this gastritis can cause death if it is acute. Data on the incidence of gastritis in Data on the incidence of gastritis from the World Health Organization (2019), the percentage of gastritis in several countries is 69% in Africa, 78% in South America, and 51% in Asia. The incidence of gastritis in the world reaches 1.8 million to 2.1 million people every year. Based on data from the Ministry of Health of the Republic of Indonesia, gastritis is one of the 10 most common illnesses in hospitals among inpatients and outpatients with a total of 234,663 cases with the majority occurring in women. In South Sulawesi province in 2018 there were 125,316 cases and this increased to 140,412 cases in 2020.

According to Basic Health Research (Riskesdas) data, the prevalence of gastritis in several Indonesian cities is as high as 91.6%, namely in the city of Medan, then in several other cities such as Surabaya 31.2%, Denpasar 46%, Jakarta 50%, Bandung 32.5%, Palembang 35.35%, Aceh 31.7%, and Pontianak 31.2% (Ministry of Health of the Republic of Indonesia, 2020). Meanwhile, in Makassar City in 2016, there were 30,167 cases of gastritis in community health centers and hospitals.

Gastritis occurs due to unhealthy human lifestyles and is transmitted through bacteria (Jardim et al., 2023). Several studies have proven the causes of gastritis include stress (Merbawani et al., 2017), smoking habits (Naisali, 2017), alcohol consumption (Adejumo et al., 2019), gender, diet, meal frequency, age and coffee consumption (Feyisa & Woldeamanuel, 2021). Apart from that, another cause is physical activity. Based on research conducted by Rimbawati et al. (2022), found that there is a relationship between physical activity and the incidence of gastritis. This is because when someone is busy with physical activities they sometimes forget to eat, and this can cause gastritis if it continues to occur continuously.

Based on several previous research results regarding the causes of gastritis, we are interested in analyzing the relationship between daily physical activity and stress with the incidence of gastritis in students because there are still a lack of researchers who examine these variables. The object of our research is students because students are susceptible to gastritis. As we know, students have more roles and obligations than students. Students are in a productive period, so a busy schedule of activities and demanding assignments or problems, both internal and external, which can trigger stress or anxiety sometimes have an impact on the emergence of gastritis in students. In this study we examined Islamic university students because they had Islamic courses in addition to general courses.

METHODS

This type of research is correlational analysis with a cross-segmental approach. The population of this study were students from Islamic Universities in Makassar, the sampling technique used a non-random sampling technique, namely accidental sampling. Research variables include; The independent variables are daily physical activity and stress levels. Meanwhile, the dependent variable is symptoms of gastritis. This sample size was determined using Cochran's formula, because the population size is unknown. The total sample used in this research was 400 people. The sample criteria are, willing to take part in research, being a student at an Islamic university in the city of Makassar. The locations for this research are several Islamic universities in Makassar City such as Universitas Islam Negeri Alauddin Makassar (UINAM) Campus 1, Muhammadiyah University Makassar (UNISMUH), Indonesian Muslim University (UMI) and Islamic University Makassar (UIM) which was held for 4 days, from the 26th to 30 October 2023. Instruments include; Demographic questionnaire, for physical activity levels, use the 1x24 hour Activity Recall Questionnaire, for stress levels, use the Depression Anxiety Stress Scales (DASS 42) questionnaire and a gastritis symptoms questionnaire containing signs and symptoms of gastritis: nausea, vomiting, decreased appetite, hot upper stomach, flatulence, belching. Data processing uses statistical software, including: Editing, Coding and Scoring. The data analysis carried out was univariate analysis and bivariate analysis with the Spearman Test using SPSS version 24 software. Panelists were asked to fill out an informed consent form indicating their intention to participate in research activities related to the Declaration of Helsinki.

Table 1
The Characteristic Respondents

Characteristics	n	%
Gender		
Man	139	34.7
Woman	262	65.3
Age (years)		
16	1	0.2
17	11	2.7
18	61	15.1
19	84	20.9
20	100	24.9
21	82	20.5
22	50	12.4
23	10	2.5
24	1	0.2
25	1	0.2
University		
UMI	166	41.2
UIM	83	20.4
Unismuh	97	24
UINAM	55	13.4
Physical Activity Category		
Light	342	85.3
Currently	24	6.0
Heavy	35	8.7
Gastritis Category		
Gastritis	132	32.9
No Gastritis	269	67.1

RESULTS

Based on data in Table 1 frequency of respondents based on gender, out of a total of 401 respondents from several Islamic universities throughout Makassar City, there were 139 (34.7%) men and 262 (65.3%) women. Frequency of respondents based on age, of the total 401 respondents, the majority of respondents were 20 years old (24.9%), while for those aged 16 years, 24 years and 25 years each there was 1 respondent (0.2%). The frequency distribution of respondents based on universities/campuses, out of a total of 401 respondents, 166 (41.2%) came from UMI, 83 (20.4%) respondents from the UIM campus, 97 from the Unismuh campus (24%) and from campus 1 UIN Alauddin Makassar as many as 55 (13.4%) respondents. Distribution of respondents based on physical activity among Islamic University students in Makassar City, there were 342 (85.3%) respondents in the light category, 24 (6.0%) in the moderate physical activity category, and 35 (8.7%) respondents fall into the heavy activity category. The frequency distribution of respondents based on stress levels, of the total 401 respondents, 226 (56.4%) fell into the normal category, 125 (31.2%) fell into the mild stress category and 125 (31.2%) respondents fell into the moderate stress category. as many as 50 (12.2%). Based on the data in table 6, the frequency distribution of respondents based on gastritis symptoms, out of a total of 401 respondents, 132 (32.9%) fell into the category of gastritis symptoms, while 269 (67.1%) respondents had no symptoms.

Based on Table 2, it shows that of the 342 respondents in the light activity category, there were 107 (31.3 %) who had symptoms of gastritis, of the 24 respondents with moderate activity, 8 (33.3%) people were found to have symptoms of gastritis. Meanwhile, there were 35 respondents with heavy physical activity and it was found that 17 (4 8.6 %) people had symptoms of gastritis. The results of the Spearmen test show that there is a correlation between daily physical activity and symptoms of gastritis in students

Table 2
Relationship between daily physical activity and stress with symptoms of gastritis

Variables	Gastritis Symptoms				N	%	P- Value
	Yes		No				
	n	%	n	%			
Physical Activity Category							
Light	107	31.3	235	68.7	342	100	
Currently	8	33.3	16	66.7	24	100	0.074
Heavy	17	48.6%	18	51.4	35	100	
Stress							
Normal	52	23.0	174	77.0	226	100	
Light	49	39.2	76	60.8	125	100	0.000*
Currently	31	62.0	19	38.0	50	100	

Note: * = Significant with @ 0.05

Makassar City Islamic University with ρ value 0,074. Because ρ value>0,05. Based on Table 2 showed that of the 226 respondents with normal stress levels, 52 people (23.0%) were found to have gastritis symptoms, of the 125 respondents with mild stress levels, 49 (39.3) respondents were found to have gastritis symptoms. And of the 50 respondents with moderate stress levels, 31 (62.0%) were found to have symptoms of gastritis. The Spearmen test results show that there is a relationship between stress levels and gastritis symptoms in students Islamic University in Makassar City with ρ value 0,000. Because ρ value>0,05.

DISCUSSIONS

WHO defines physical activity as any body movement produced by skeletal muscles and requiring energy expenditure. Physical activity refers to all movement, including during leisure time, traveling to and from a location, or as part of one's work. Moderate and vigorous intensity physical activity improves health (World Health Organization, 2019). One of the main causes of non-communicable diseases is lack of physical activity. PTM diseases that are still a scourge in Indonesia include diabetes, hypertension, coronary heart disease, kidney failure and stroke. In table 6, of the 401 respondents, the majority had activities in the light category.

Based on the results, there is no relationship between physical activity and symptoms of gastritis in Islamic University students in Makassar City. This is in line with Almira's research which states that physical activity, stress, sleep patterns, smoking and alcohol consumption have no relationship with the incidence of gastritis symptoms in teenagers in DKI Jakarta (Putri, 2021). This is not in line with research by Sara et al. (2021) where there is a relationship between physical activity and the incidence of gastritis. This research is also not in line with that carried out by Supriyanto & Firmanti (2014) regarding the relationship between exercise programs and the incidence of stomach ulcers in the Terate Faithful Brotherhood in Glagah Banyuwangi. It was found that there was a significant relationship between heavy physical activity and the incidence of gastritis.

Research conducted by Permana et al. (2020) entitled Analysis of Nutritional Status, Eating Habits and Physical Activity in Health Students using the MIX-METHOD approach. It was found that students were busy in the study process with a high workload, causing students to not have time to do physical activities such as exercising.

This study found that 132 respondents who had symptoms of gastritis, the majority were those with low activity, 107 (31.3%) people, while the lowest occurred in those with moderate activity, 8 (33.3%). Even though in the physical activity category there are more people who have no symptoms if you look specifically at only the light activity category, the number 107 still looks quite a lot. After checking the respondent's answer data again, it turned out that the respondent had an irregular sleep pattern. On average, respondents have less than 6 hours of sleep, even though adults aged 19-25 need an ideal sleep time of 8 hours. Poor sleep patterns will affect the neurovascular system in the body, one of which is the digestive system. This irregular sleep pattern is usually triggered by assignments so that sometimes students sleep late at night and if coursework piles up it sometimes makes students restless causing students to almost always wake up in the middle of the night due to emotional disturbances, worries which can trigger stress which will increase stomach acid and affect symptoms. gastritis.

Physical activity has many health benefits and prevents stomach ulcers. People with gastritis, when compared with healthy people, have greater limitations in the mobility of the stomach and diaphragm. They also showed more musculoskeletal dysfunction in the cervical spine. So, people who lack physical activity can experience musculoscetal damage associated with symptoms of gastritis (Koon et al., 2017).

Physical activity is associated with brain health and the number of gut bacteria (Mokhtarzade et al., 2022). Physical activity appears to be a relatively rare environmental factor that can cause qualitative and quantitative changes in the composition of the gut microbiota. Exercise increases microbiome diversity and increases rates of Bacteroidetes and Firmicutes strains, which have positive effects on weight loss and prevention of gastrointestinal diseases and colon cancer. Exercise also stimulates the proliferation of bacteria, regulates the immune function of the intestinal mucosa, restores the function of the intestinal barrier, thereby reducing the incidence of obesity and metabolic diseases. Therefore, exercise may play an important role in maintaining the balance of gut microbiota or as a treatment method (Ge et al., 2023). Non-Helicobacter pylori Helicobacter (NHPH) is associated with various diseases such as gastritis, but this research actually shows that there is no significant relationship in certain populations (Abuduwaili et al., 2023). The presence of H. Pylori was found to influence trace element metabolism and viscosity blood in patients with ulcers (Ergun et al., 2022).

Gastritis can be caused by several factors, including smoking, alcohol consumption, diet, use of NSAIDs and physical activity. Smoking increases gastric acid secretion and can therefore irritate the stomach lining. Research conducted by Naisali (2017) found that there is a significant relationship between smoking behavior and the incidence of gastritis in Engineering students at Tunggadewi University, Malang. Alcohol consumption can also cause symptoms of gastritis. Research conducted by Wahyudi et al. (2018) found that there is a significant relationship between the habit of consuming alcoholic drinks and the incidence of gastritis in late adolescents (18-21 years) in the Papuan Boys' Dormitory, Malang City with p value= (0.000).

The use of NSAIDs can cause recurring stomach ulcers due to excessive HCl production, which irritates the stomach lining. And when using NSAIDs, the mechanism of action of NSAIDs is to inhibit the activity of the cyclooxygenase enzyme so that COX-1 is unable to form prostaglandins in the stomach. If prostaglandins are not formed in the stomach, adenyl cyclase will form, causing the proton pump to open, then acid (H+) in the stomach will flow from the stomach to the stomach lumen to meet Cl- ions and form stomach acid. If this phenomenon lasts a long time and occurs continuously, the amount of stomach acid in the stomach will be excessive, which will erode the stomach lining (Purbaningsih, 2020).

Stress is a person's reaction both physically and emotionally (mental/psychological) to environmental changes that require adaptation. There are 3 levels of stress including; (1) Mild stress is stress that does not cause physical harm. Forgetting, oversleeping, being blamed, getting stuck, etc. (2) Moderate stress, lasting from several hours to several days. Responses to this level of stress can include stomach and intestinal disorders such as ulcers, irregular bowel movements, muscle tension, disturbed sleep patterns, changes in the menstrual cycle, as well as poor concentration and memory. (3) Severe stress is chronic stress that lasts for weeks to years. Reactions to this level of stress include severe indigestion, increased heart rate, shortness of breath, shaking, increased anxiety and fear, confusion, and panic. In line with this, Allah says in Q.S Al-Baqarah/2:155, which means:

> *"And We will surely test you with something of fear and hunger and a loss of wealth and lives and fruits, but give good tidings to the patient".*

Allah SWT loves believers who are strong and not weak, both physically and spiritually, this is found in the hadith of the Prophet SAW in HR. Muslim No. 2664 which means:

> *"From Abu Hurairah, he said, Rasûlullâh said, a strong believer is better and more loved by Allah Azza wa Jalla than weak believers....."*

Students face an adaptation process, both to the new study environment and to their new place of residence. From adapting to new course systems, friends, environments and cultures. Factors that cause high levels of stress in students include: (1) Each individual has a different personality in responding to things and adapting to the environment. (2) Differences in individual circumstances. This background can include educational, social, cultural and economic background. (3) Differences in learning motivation (Suharsono & Anwar, 2020).

Stress/a person's psychology has a very strong relationship between mental disorders and the gastrointestinal tract of a stressed person, because stress can increase stomach acid and gastrointestinal motility. This can happen because the brain's nervous system is connected to the stomach, so if a person experiences stress this will cause abnormalities in the stomach which can then cause balance disorders (Rimbawati et al., 2022).

Stressful conditions can have significant effects on cognitive function. This is mostly caused by the hormone cortisol (Law & Clow, 2020). Stress has a negative effect through a neuroendocrine mechanism (an increase in the hormone cortisol causes the release of gastric juice (peptin and HCL) in the digestive tract, thereby increasing the risk of ulcers) (Elliya & Haryanti, 2020). Research conducted by Antony et al. (2022) found that there is a significant relationship between stress levels and the incidence of gastritis (p value = 0.001). Research is not in line with research conducted by Safii & Andriani (2019) regarding factors related to the incidence of gastritis in patients seeking treatment at community health centers. This research uses primary data from three variables. The limitation of the research is that the subjects only come from Islamic universities in south Sulawesi.

CONCLUSIONS

This study found there is no correlation between daily physical activity and symptoms of gastritis in students in Islamic University but there is a relationship between stress levels and gastritis symptoms. We recommend to study subjects to regulate their daily physical activity stress levels to control gastritis-related symptoms. For future researchers to be able to carry out further research by combining several methods and using more general subjects so that the analysis results are more comprehensive.

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AUTHORS' CONTRIBUTIONS
Dwi S. Damayati designed the study, formulated the concept, wrote and revised the manuscript, acquired and analyzed the data, approved the final manuscript. Ani A. Ilmi designed the study, formulated the concept, wrote and revised the manuscript approved the final manuscript. Citra Mangallo, Jumriatun Naillah, Dhea Adelia, and Fitrah Ramadhan enrolled participants, collected data and performed the field work

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COMPETING INTERESTS
The author(s) declare no potential conflict of interest with respect to the research, authorship, and/or publication of this article.

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