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Original Article

Occurrence of Gastritis Is Related to Stress among Health Science Students

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Abstract

Background: Gastritis is among the top 10 health issues in Indonesia, with stress as the primary factor. Stress can put students at risk, leading to stress management neglect. This study aimed to find the relationship between stress and the occurrence of gastritis among students, especially those majoring in health sciences.

Methods: This was a retrospective cohort study conducted from October 2022 to March 2023 on 273 health science students at the University of Jember, Indonesia, using a simple random sampling method. Data on gastritis occurrence with stress was analysed, using the Spearman's rank correlation test.

Results: The majority of respondents were female (84.2%) aged 22 years (50.2%) and were at the post-proposal seminar stage (55.7%). Stress level was moderate in each type of stress (41.8–46.9%). There was a relationship between the type of stress and the gastritis occurrence ($p<0.05$). The type of stress that was strongly associated with the occurrence of gastritis was social-related stressor (SRS) ($r= 0.316$).

Conclusions: The study highlights the impact of stress on physical health and encourages the use of mental health services on campus to prevent and address related issues. Further studies are needed to explore other contributing factors. A better healthy lifestyle among students with a health sciences background is recommended.

Keywords: Gastritis, health student, psychological stress.

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Introduction

Gastritis is a common digestive system disorder characterized by stomach lining inflammation.[1] Globally, the annual cases of gastritis range from 1.8 to 2.1 million.[2] In 2015, the World Health Organization (WHO) reported 5,387 deaths attributed to gastritis.[3] Based on Global Burden Disease data, the estimated number of gastritis sufferers in 2020 in Indonesia was 1,163,401 cases in the entire population, with a prevalence of 0.55% and a rate of 421.67, meaning that there are an estimated 421 cases of gastritis per 100,000 population.[4] In addition, gastritis is one of the 10 diseases with the most hospitalizations in health services.[5]

Acute gastritis can progress to chronic gastritis, gastric cancer, and peptic ulcers if left untreated.[6] College students are particularly vulnerable due to academic and lifestyle demands.[7] Psychological stress is the primary factor that can be caused by various stressors including academic-related stressor (ARS), interpersonal and intrapersonal-related stressor (IRS), teaching and learning-related stressor (TLRS), social-related stressor (SRS), drive and desire-related stressor (DRS), and group activities-related stressors (GARS).[8,9]

Furthermore, certain groups including women, workers, and students, are vulnerable to gastritis. However, among these groups, students are the most susceptible due to academic and other pressures, which can lead to poor diet, lifestyle, and stress management.[7,10] A previous study shows that 37.2% of students are susceptible to stress, which can trigger gastritis. This vulnerability extends to health students who may have unhealthy behaviors and poor stress management, leading to gastritis.[11] Students in health-related fields, despite their knowledge about health and

healthy living, can still experience gastritis due to unhealthy behaviors and lifestyles, such as poor stress management.

Gastritis can significantly impact students' daily lives and academic performance by affecting their concentration. Understanding the factors contributing to gastritis, including different types of stress, can help develop more effective prevention and treatment strategies. Research in this area is crucial to identify the specific types of stress associated with gastritis and to implement appropriate interventions. This study aimed to explore a relationship between the type of stress and the occurrence of gastritis among health science students.

Methods

This study used a retrospective cohort design, carried out from October 2022 to March 2023. Simple random sampling technique was used to acquire a sample of 273 students from 5 faculty of health sciences in the University of Jember, Indonesia including Faculty of Medicine, Faculty of Dentistry, Faculty of Pharmacy, Faculty of Nursing, Faculty of Public Health who were in the final semester and preparing their final assignments or minor thesis. Students who did not fill in the questionnaire and experienced eating disorders were excluded from this study. This research has received ethical clearance from the Health Researched Ethics Commission of the Faculty of Dentistry, University of Jember, Indonesia with letter number 1894/UN25.8/KEPK/DL/2023.

Data on respondent characteristics, types of stress, and occurrence of gastritis were obtained from interviews conducted through online questionnaires. In addition, secondary data from medical records at the University of Jember Medical Center (UMC) Unit were used to analyse the number of gastritis cases where these gastritis cases were confirmed based on a doctor's diagnosis.

The independent variables used in this study were ARS, IRS, TLRS, SRS, DRS, and GARS. These types of stress were measured using the medical student stressor questionnaire (MSSQ), which was comprised of 40 questions with responses scored from 0 to 3 which categorized as light, moderate, heavy, and extreme stress.

In brief, ARS was a level of stress that arose due to the burden of education, IRS was level of stress that occurred due to interactions with

Table 1 Characteristics of Respondents and Gastritis Category

Variable	n	%
Age (year)		
19	4	1.5
20	20	7.3
21	98	35.9
22	137	50.2
23	14	5.1
Gender		
Male	43	15.8
Female	230	84.2
Faculty		
Faculty of Medicine	66	24.2
Faculty of Dentistry	19	7.0
Faculty of Pharmacy	51	18.7
Faculty of Nursing	68	24.9
Faculty of Public Health	69	25.3
Period of Study		
Proposal pre-seminar	81	29.7
Post proposal seminar	152	55.7
Pre-trial thesis	24	8.8
After the thesis trial	16	5.9
Gastritis category*		
Mild	165	60.4
Moderate	102	37.4
Severe	6	2.2

Note: *The scores <7= mild, score 7–13= moderate, scores ≥14=severe

Table 2 Respondents' Answers to the Types of Stress Questionnaire

Statement	Answers Option				
	0 (n)	1 (n)	2 (n)	3 (n)	4 (n)
Academic-related stressors (ARS)					
Exams	22	67	139	33	12
Difficulty understanding course material	26	77	122	41	7
Too much material to learn	13	49	119	70	22
Getting bad grades	13	53	104	64	39
Competition in learning	55	75	96	38	9
Inability to answer questions asked by lecturers	36	83	97	41	16
Rarely reviewing previously taught material.	72	75	95	22	9
Missing material	32	74	102	50	15
Being required to be the best	23	39	77	85	49
Excessive workload	19	37	95	81	41
Doubts about graduating from college	48	75	69	50	31
Dissatisfaction with study results	32	84	98	47	12
Working on final assignments	14	32	76	62	89
Interpersonal and intrapersonal-related stressors (IRS)					
Problems with other students	74	101	56	32	10
Lack of motivation to learn	26	78	85	60	24
Feeling incompetent	12	46	98	85	32
Conflicts with lecturers	20	42	69	89	53
Physical or verbal harassment from peers	74	74	86	26	13
Conflicts with employees or staff	81	84	74	22	12
Teaching and learning related stressors (TLRS)					
Verbal or physical abuse from lecturers	34	40	78	82	39
Work is not being appreciated.	19	46	93	87	28
Inappropriate assignments	20	67	115	55	16
Insufficient lecture materials	33	76	110	38	16
Lack of guidance from lecturers	15	60	106	58	34
Not getting good feedback from lecturers.	29	70	101	54	19
Social related stressors (SRS)					
Lack of time with family and friends	31	61	102	52	27
Interrupted while working on assignments	29	78	101	53	12
Lack of time for revision	32	48	98	72	23
Lack of personal time	36	63	78	57	39
Physical or verbal harassment from employees	83	74	72	32	12
Unsupportive living environment	45	64	89	49	26
Drive and desire related stressors (DRS)					
Being a burden on family responsibilities	16	36	68	71	82
No interest in studying health sciences	91	83	63	25	11
Parent's Willingness to Take up a Health Science Major	133	54	46	27	13
Group activities related stressors (GARS)					
Participation in group assignments or presentations	92	88	66	19	8
Lack of confidence in discussions	36	92	98	35	12
Perceived pressure to do things perfectly	39	68	83	61	22
Financial difficulties	23	51	79	55	65
Minority in group discussions or organizations	61	86	84	27	15
Problems in organizations or groups	51	86	101	24	11

Note: 0= Not Stressed, 1= Slightly stressed, 2= Moderately stressed, 3= Very stressed, 4= Extremely stressed

the self and conflicts with other people, TLRS was the stress that arose in connection with the teaching and learning process or activities, SRS occurred due to relationships with other people, such as support, advice, and others. DRS was the level of stress that arose from internal or external coercion, GARS was a stress that occurred due to interactions within

a group or organization.

The dependent variable in this study was the suspected incidence of gastritis. The scores below seven were considered mild, between 7 and 13 were classified as moderate, and scores of 14 or higher were categorized as severe.

The validity of the questions was confirmed using the Pearson moment correlation test, and the gastritis questionnaire was validated after modification and testing as the correlation value exceeded the threshold (≥3.61).

Univariate analysis was used to describe the characteristics of Jember University health group students, types of stress experienced, and the distribution of occurrence gastritis incidents. Bivariate analysis was also conducted to explore the relationship between dependent and independent variables. The Spearman rank correlation test was used with a significant relationship indicated by a p-value of <0.05.

Results

Of 273 respondents, the majority were female (n=230; 84. 2%) aged 22 years old (n=137; 50.2%), and from the Faculty of Public Health (n=69; 25.3%). Their current position was at the post-seminar proposal stage of their thesis (n=152, 55.7%) as shown in Table 1. Based on the alleged gastritis scores, the most respondents had a mild gastritis (n=165, 60.4%), and only 2.2% (n=6) had severe gastritis (Table 1).

The type of stress was measured using the MSSQ questionnaire consisting of 40 statement items with five answer choices. Based on the answers to the questionnaire, it was found that

Table 3 Types and Level of Stress among Respondents

Types and Level of Stress	n	%
ARS		
Light stress	35	12.8
Moderate stress	114	41.8
Heavy stress	109	39.9
Extremely stress	15	5.5
IRS		
Light stress	43	15.8
Moderate stress	122	44.7
Heavy stress	97	35.5
Extremely stress	11	4.0
TLRS		
Light stress	85	31.1
Moderate stress	128	46.9
Heavy stress	53	19.4
Extremely stress	7	2.6
SRS		
Light stress	52	19.0
Moderate stress	115	42.1
Heavy stress	92	33.7
Extremely stress	14	5.1
DRS		
Light Stress	86	31.5
Moderate stress	124	45.4
Heavy stress	48	17.6
Extremely stress	15	5.5
GARS		
Light stress	85	31.1
Moderate stress	128	46.9
Heavy stress	53	19.4
Extremely stress	7	2.6

Note: ARS= Academic-related stressors, IRS= Interpersonal and intrapersonal-related stressors, TLRS= Teaching and learning related stressors, SRS= Social related stressors, DRS= Drive and desire related stressors, GARS= Group activities related stressors

Table 4 Respondents' Answers to the Gastritis Questionnaire

No	Statement	Answers Option			
		0 (n)	1 (n)	2 (n)	3 (n)
1	I feel pain in the pit of my stomach	99	144	26	4
2	I feel nauseous and vomit	96	138	37	2
3	My stomach feels full or easily full	86	117	63	7
4	I feel like fluid from my stomach is rising into my mouth and tastes bitter	131	103	36	3
5	I feel bloated or full	83	130	57	3
6	I experience cold sweats	152	97	24	0
7	I burp before and after eating	58	144	52	19

Note: 0= never, 1= sometimes, 2= often, 3= always

most respondents gave moderately stressed answers (Table 2).

The most of respondents had a moderate level of stress in each type of stress with the distributions as follows: type ARS (41.8%), IRS 122 (44.7%), TLRS (46.9%), SRS (42.1%), DRS (45.4%), and GARS (46.9%) (Table 3).

Table 4 shows the results of respondents' answers to gastritis symptoms. The majority of respondents experienced gastritis symptoms

Table 5 Relationship between the Type of Stress and the Occurrence of Gastritis among Respondents (n=273)

Types of Stress	Occurrence of Gastritis			P-value*	R-value
	Mild (n) (n=165)	Moderate (n) (n=102)	Severe (n) (n=6)		
ARS					
Light stress	30	5	0		
Moderate stress	73	39	2	0.000	0.235
Heavy stress	56	49	4		
Extremely stress	6	9	0		
IRS					
Light stress	36	7	0		
Moderate stress	75	42	5	0.000	0.216
Heavy stress	50	46	1		
Extremely stress	4	7	0		
TLRS					
Light stress	66	17	2		
Moderate stress	72	53	3	0.000	0.243
Heavy stress	25	27	1		
Extremely stress	2	5	0		
SRS					
Light stress	43	8	1		
Moderate stress	77	35	3	0.000	0.316
Heavy stress	42	48	2		
Extremely stress	3	11	0		
DRS					
Light Stress	63	22	1		
Moderate stress	72	47	5	0.002	0.185
Heavy stress	22	26	0		
Extremely stress	8	7	0		
GARS					
Light stress	66	17	2		
Moderate stress	72	53	3	0.000	0.243
Heavy stress	25	27	1		
Extremely stress	2	5	0		

Note: * The Spearman rank correlation test

Table 6 Relationship between Respondent Characteristics, Type of Stress, and Occurrence of Gastritis among Respondents

Respondent Characteristic	P-value*						
	ARS	IRS	TLRS	SRS	DRS	GARS	Gastritis
Age	0.072	0.074	0.125	0.124	0.057	0.125	0.058
Gender	0.000	0.267	0.253	0.062	0.798	0.253	0.008
Faculty	0.019	0.038	0.707	0.527	0.669	0.707	0.042
Period of Study	0.267	0.651	0.321	0.182	0.212	0.321	0.350

Note: ARS= Academic-related stressors, IRS= Interpersonal and intrapersonal-related stressors, TLRS= Teaching and learning related stressors, SRS= Social related stressors, DRS= Drive and desire related stressors, GARS= Group activities related stressors

at mild to moderate levels, with the majority answering "sometimes" for various symptoms. The most common symptoms experienced were heartburn, nausea, feeling full, and belching. Meanwhile, cold sweats were the least frequently reported symptom.

Each typed of stressed had a significant relationship with the occurrence of gastritis ($p<0.05$). The dominant type of stress associated with the suspected occurrence of gastritis was SRS ($r=0.316$) (Table 5), indicating that related stressors affected the occurrence of gastritis by 31.6%. The remaining 68.4% was influenced by other factors that was not examined in this study.

Interestingly, age and stage showed no correlation with stress type or gastritis ($p>0.05$). However, gender correlated with academic, interpersonal, and intrapersonal stress, as well as gastritis occurrence ($p<0.05$). Faculty was significantly associated with academic stress, interpersonal stress, intrapersonal stress, and gastritis occurrence (Table 6).

Discussion

The research shows that gender is related to academic, interpersonal, and intrapersonal stress, as well as the occurrence of gastritis. Female students are more prone to gastritis, it is possibly due to differences in eating habits and body image concerns.[12] Studies consistently find that women report higher stress levels and greater need for social support. Difficulties in accessing support systems can contribute to higher stress levels in women. Research shows that women have a higher risk of developing gastritis, which is 6.667 times greater than men.[13] In addition, various studies have confirmed the correlation between gender and stress levels, where women tend to report higher levels of stress and better quality of social support. Lack of a support system can be a trigger for stress in women. They experience more significant stress, which is influenced by difficulty obtaining an adequate support system.[14]

The incidence of gastritis and stress is correlated with faculty, academic loads, and assignment types. Clinical practice, practical examinations, and clinical reports cause significant stress for health students, especially nursing and medical students.15 In addition, the classroom, surroundings, and intrapersonal, clinical, and interpersonal learning processes are the leading causes of stress for nursing students.[16]

Based on the results of the type of stress analysis, the majority of respondents were at moderate stress levels. Final-year students are dominated by moderate stress levels.[12] The busy schedule of lectures, field practice, numerous deadlines, and other assignments makes it challenging for health students, especially in their final year, leading to increased stress.[17] Based on the results of the analysis, it was obtained that the majority of respondents experienced occurrence mild gastritis. This is according to research at West Sumatra, which states that the majority of students experience gastritis with mild symptoms.[15] This is because based on the results of the questionnaire the majority of respondents only experienced 1 to 2 symptoms, so they were still in the mild category.[18]

Academic stress can significantly affect students' health, leading to a 51% incidence of gastritis. Dissatisfaction with academic performance, fatigue from assignments, numerous exams, and anxiety over unmet targets are all contributing factors.[17] Research in Nepal states that students who have Academic Related Stressor high levels can cause high activity of the sympathetic nerves in the body.[18] The high activity of the sympathetic nerves can cause an increase in stomach acid production which triggers gastritis.

The analysis found a significant relationship between IRS and occurrence gastritis among final-year students in the health science students at the University of Jember.

Differences in intrapersonal aspects, such as self-confidence or self-efficacy, are associated with gastritis in college students. Additionally, low levels of self-efficacy can lead to high-stress levels.[19] Interpersonal stressors, such as relationships with others, can contribute to gastritis in college students. Supportive friends and family can reduce stress and anxiety, promoting good lifestyle habits and preventing gastritis.[20]

The results of the analysis show that there is a significant relationship between TLRS with the occurrence gastritis. This is according to research which reported that TLRS had a 2.7 times chance of causing stress and 2.8 times causing depressive symptoms in college students.[21] The stress experienced by students has an influence on their eating patterns and psychology. This can cause disruption in hormones and trigger an increase in stomach acid production in the body which can result in gastritis.[22]

The analysis reveals a significant relationship between SRS and alleged cases of gastritis. Research in Magelang indicates that social stress, encompassing social and physical environments, is related to individual stress levels. Social-related stressors, such as a lack of free time due to busyness or physical activity, can impact both stress and gastritis.[23] High activity levels are associated with a 4.081 times greater chance of experiencing gastritis compared to low activity levels.[24]

There is a significant relationship between DRS with the alleged incidence of gastritis. Research in Nepal also states that if someone has a stress related to drive, it will reduce the performance of parasympathetic activity, which regulates various bodily activities, such as digestion and metabolism.[18] Reduced parasympathetic activity leads to increased stomach acid production, reduced blood flow, and muscle contractions that can cause gastritis.[25]

The analysis shows a significant relationship between ARS and the alleged incidence of gastritis. There is a correlation between group activities, including organizational activities, and the emergence of stress in students. Research in Nepal also states that a high level of group activity stress causes sympathetic nerve activity to increase, which can increase hydrochloric acid production.[18]

Occurrence of gastritis in final-year students at Jember University primarily due to the stressed about the shift from online to offline learning during the transition to the new normal. This change necessitates readjustment to new social conditions.[26] Students experiencing offline learning report less free time, leading to irregular eating patterns and gastritis symptoms. The lack of social support for health group students working on their thesis has become a dominant stressor, with lower social support correlating to higher stress levels during final projects.[27]

The limitation of this study is that the gastritis has been categorized based on the symptoms experienced by the respondent using questionnaire. Therefore, a definite diagnosis is favorable based on the results of medical records and other examinations. This study used questionnaires that had been validated first and carried out study replication in different populations with the same characteristics.[28]

In conclusion, all types of stress, such as academic, interpersonal, intrapersonal, teaching and learning, and group activities, are significantly associated with gastritis in health sciences students. The dominant type of stress related to occurrence gastritis is social stress. These findings may be used to develop stress prevention programs and improve mental health services. Further research is needed to understand the mechanisms linking stress to gastritis and explore practical ways to manage the stress. A better healthy life style among students is recommended.

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