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Penulis	**:**	Riky Hamdani, Anita Fitriani, Maharani Laillyza Apriasari

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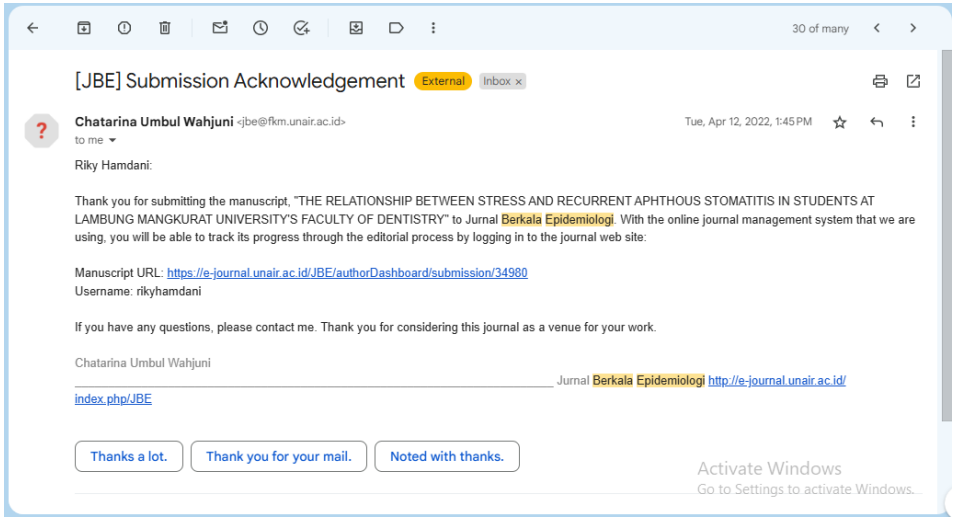

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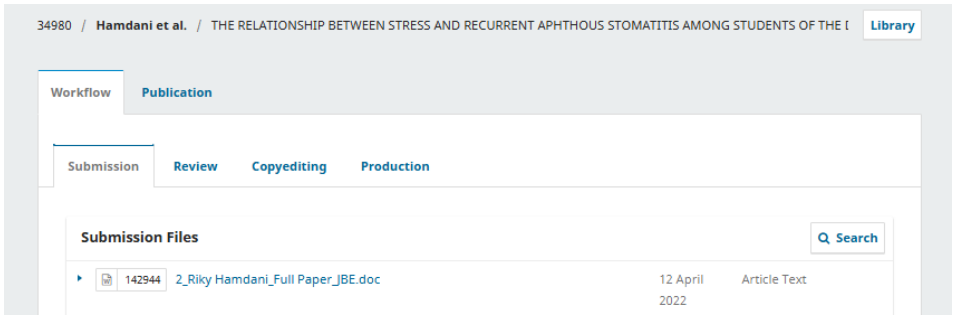

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THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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At least four to five key words are sorted alphabetically and separated by commas. Keywords should be carefully chosen to reflect the concept of articles to improve the completeness of modern scientific articles that can help readers to access articles.

ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8.0% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentisty, Universitas Lambung Mangkurat. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8,0% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR..* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi FKG ULM. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,2%.Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi FKG ULM dengan nilai signifikansi sebesar 0,01 (p<0,05).* ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan resiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta et al., 2018)

The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8.0% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Apriasari, 2019). Predisposing factors for SAR at RSGM Gusti Hasan Aman Banjarmasin showed that of 66% of SAR cases, 34.3% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari et al., 2019).

Research in Saudi Arabia by Alkatheri et al. states that the stress level of students majoring in dentistry is higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. Research from Alhajj et al. states that dental clinic students have a higher stress level than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students (Alhajj et al., 2018). Research from Kwak et al. stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak et al., 2020).

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University, with No. 013/KEPKG-FKGULM/EC/II/2021. This study used an analytic observational research design with a cross-sectional study design. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely FKG ULM professional students who have experienced recurrent aphthous stomatitis in the last 1-2 years, have no history of systemic disease, do not have allergies, not caused by trauma, and professional students who have been at professional level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire.

Data analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in table 1.

Table 1
Gender Frequency Distribution

Gender	Frequency (n)	Percentage (%)
Male	9	16%

Female	48	84%
Total	80	100%

Source: Primary Data

Table 1. shows that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%).

The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. The distribution of the stress frequency of respondents can be observed in table 2.

Table 2

Distribution of respondent's stress frequency

Age	Frequency (n)	Percentage (%)
Mild Stress	19	23.8%
Moderate Stress	27	33.8%
Heavy Stress	34	42.5%
Total	80	100%

Source: Primary Data

Table 2. shows that most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (23%).

The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results. The distribution of the respondents' RAS frequency can be seen in Table 3.

Table 3

Distribution of RAS Frequency experienced by respondents

RAS	Frequency (n)	Percentage (%)
Negative	17	29.8%
Positive	40	70.2%
Total	57	100%

Source: Primary Data

The results of the RAS evaluation show that 40 respondents (70.2%) had a positive RAS and 17 respondents (29.8%) had a negative RAS.

The results of the stress test that have been obtained are then adjusted based on gender. In Table 4, the distribution of the stress frequency of respondents by gender can be observed.

Table 4

Distribution of Respondents' Stress Frequency by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%).

The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 5.

Table 5

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

The results of the RAS frequency based on gender are from table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results of the stres and stomatitis aftosa rekuren from the respondents will be used to perform uji chi square in order to determine the relationship between stres and RAS in a professor

at Gigi Universitas Lambung Mangkurat.The result of uji chi square can be found in table 6.

Table 6
The relationship between stress and recurrent aphthous stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69,2%)	4 (30,8%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Severe	2 (10,5%)	17 (89,5%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. This study is in accordance with the results of research by Husada et al. which measured stress levels in dentistry students, saying that moderate levels of stress were the most common compared to others, with a percentage of 96.8%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.2% (Husada et al., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Research by Jowkar et al. stated that female dentistry students suffer from severe stress more than male students. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar et al., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul et al., 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.2%. The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. Previous research from Johani in 2019 on the prevalence of recurrent aphthous stomatitis in Saudi dental students found the same thing; the RAS for females was 11.8% and 9.9% for males.RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS

with a value of 8.5%, compared to males only around 7.4% (Kemenkes RI, 2019).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Sari, 2019; Hernawati, 2013).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study by Kunikullaya et al. , which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya et al., 2017). Research conducted in Saudi Arabia by Ajmal et al. showed similar results: there was a significant relationship between stress and RAS in dental students (Ajmal et al., 2018).

One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Hernawati, 2013). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012)

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). Research by Kunikullaya in 2017 stated that the higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

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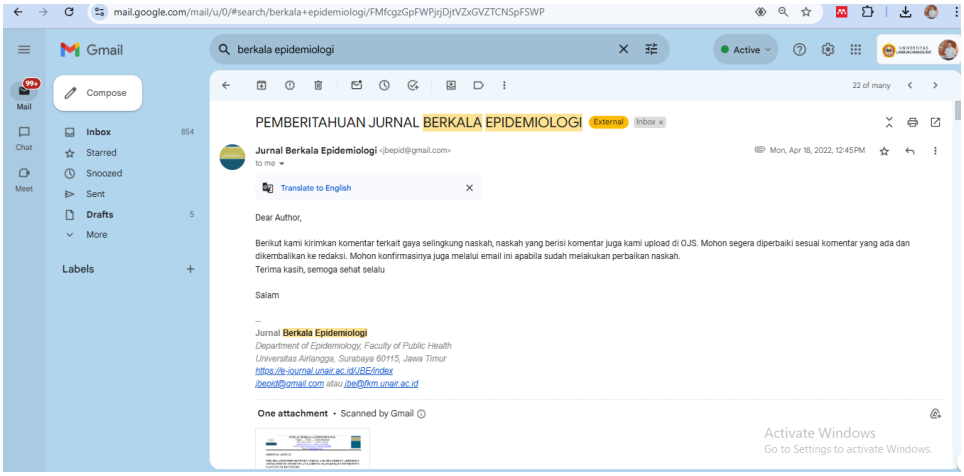

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THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8.0% of all oral health problems in Indonesia. **Purpose:**

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Keywords:
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~~keyword 2;~~ stomatitis
~~keyword 3;~~ oral disease

Kata Kunci:
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~~*kata kunci 2;*~~ *Stomatitis*
~~*kata kunci 3;*~~*penyakit mulut*

To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentisty, Universitas Lambung Mangkurat. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8,0% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR..* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi FKG ULM. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,2%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi FKG ULM dengan nilai signifikansi sebesar 0,01 (p<0,05).* ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan resiko timbulnya SAR.*

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INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018)

The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8.0% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Apriasari, 2019). Predisposing factors for SAR at RSGM Gusti Hasan Aman Banjarmasin showed that of 66% of SAR cases, 34.3% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research in Saudi Arabia by Alkatheri et al. states that the stress level of students majoring in dentistry is higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. Research from Alhajj et al. states that dental clinic students have a higher stress level than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students (Alhajj et al., 2018). Research from Kwak et al. stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020).

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University, with No. 013/KEPKG-FKGULM/EC/II/2021. This study used an analytic observational research design with a cross-sectional study design. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely FKG ULM professional students who have experienced recurrent aphthous stomatitis in the last 1-2 years, have no history of systemic disease, do not have allergies, not caused by trauma, and professional students who have been at professional level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire.

Data analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

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RESULTS

The frequency distribution of respondents by gender can be seen in table 1.

Table 1
Gender Frequency Distribution

Gender	Frequency ~~(n)~~	~~Percentage~~ (%)
Male	9	16%
Female	48	84%
Total	80	100%

Source: Primary Data

Table 1. shows that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. The distribution of the stress frequency of respondents can be observed in table 2.

Table 2
Distribution of respondent's stress frequency

Age	Frequency (n)	Percentage (%)
Mild Stress	19	23.8%
Moderate Stress	27	33.8%
Heavy Stress	34	42.5%
Total	80	100%

Source: Primary Data

Table 2. shows that most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (23%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results. The distribution of the respondents' RAS frequency can be seen in Table 3.

Table 3
Distribution of RAS Frequency experienced by respondents

RAS	Frequency (n)	Percentage (%)
Negative	17	29.8%
Positive	40	70.2%
Total	57	100%

Source: Primary Data

The results of the RAS evaluation show that 40 respondents (70.2%) had a positive RAS and 17 respondents (29.8%) had a negative RAS.

The results of the stress test that have been obtained are then adjusted based on gender. In Table 4, the distribution of the stress frequency of respondents by gender can be observed.

Table 4
Distribution of Respondents' Stress Frequency by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%).

The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 5.

Table 5
Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

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The results of the RAS frequency based on gender are from table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results of the stres and stomatitis aftosa rekuren from the respondents will be used to perform uji chi square in order to determine the relationship between stres and RAS in a professor at Gigi Universitas Lambung Mangkurat.The result of uji chi square can be found in table 6.

Table 6
The relationship between stress and recurrent aphthous stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69,2%)	4 (30,8%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Severe	2 (10,5%)	17 (89,5%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. This study is in accordance with the results of research by Husada et al. which measured stress levels in dentistry students, saying that moderate levels of stress were the most common compared to others, with a percentage of 96.8%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.2% (Husada, Susiana, & E., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Research by Jowkar et al. stated that female dentistry students suffer from severe stress more than male students. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.2%. The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. Previous research from Johani in 2019 on the prevalence of recurrent aphthous stomatitis in Saudi dental

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students found the same thing; the RAS for females was 11.8% and 9.9% for males.RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 8.5%, compared to males only around 7.4% (Kemenkes RI, 2019).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Sari, 2019; Hernawati, 2013).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study by Kunikullaya et al. , which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia by Ajmal et al. showed similar results: there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Hernawati, 2013). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012)

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). Research by Kunikullaya in 2017 stated that the higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

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Jurnal:12
Non-Jurnal (blok kuning): 4

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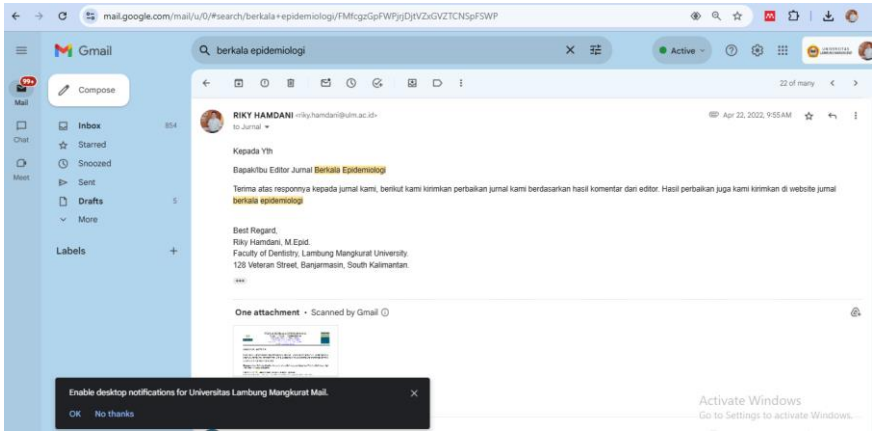

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

ABSTRAK

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dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi FKG ULM dengan nilai signifikansi sebesar 0,01 (p<0,05). ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta et al., 2018)

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METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University, with No. 013/KEPKG-FKGULM/EC/II/2021. This study used an analytic observational research design with a cross-sectional study design. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely FKG ULM professional students who have experienced recurrent aphthous stomatitis in the last 1-2 years, have no history of systemic disease, do not have allergies, not caused by trauma, and professional students who have been at professional level for more than 2 years. The

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Total	80	100%

Source: Primary Data

Table 1. shows that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. The distribution of the stress frequency of respondents can be observed in table 2.

Table 2
Distribution of respondent's stress frequency

Age	n	(%)
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Total	57	100%

Source: Primary Data

Table 2. shows that most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results. The distribution of the respondents' RAS frequency can be seen in Table 3.

Table 3
Distribution of RAS Frequency experienced by respondents

RAS	n	(%)
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

Source: Primary Data

The results of the RAS evaluation show that 40 respondents (70.18%) had a positive RAS and 17 respondents (29.82%) had a negative RAS.

The results of the stress test that have been obtained are then adjusted based on gender. In Table 4, the distribution of the stress frequency of respondents by gender can be observed.

Table 4
Distribution of Respondents' Stress Frequency by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%).

The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 5.

Table 5
Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

The results of the RAS frequency based on gender are from table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from table 6.

Table 6
The relationship between stress and recurrent aphthous stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69,23%)	4 (30,77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10,53%)	17 (89,47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in table 7.

Table 7
Test the association of stress on the incidence of recurrent aphthous stomatitis.

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13-times greater risk of developing RAS compared to those with severe stress levels. terkena SAR dibandingkan dengan tingkat stress berat.

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. This study is in accordance with the results of research by Husada et al. which measured stress levels in dentistry students, saying that moderate levels of stress were the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada et al., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Research by Jowkar et al. stated that female dentistry students suffer from severe stress more than male students. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar et al., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul et al., 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. Previous research from Al-Johani in 2019 on the prevalence of recurrent aphthous stomatitis in Saudi dental students found the same thing; the RAS for females was 11.78% and 9.95% for males.RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely

suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019)

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study by Kunikullaya et al. , which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya et al., 2017). Research conducted in Saudi Arabia by Ajmal et al. showed similar results: there was a significant relationship between stress and RAS in dental students (Ajmal et al., 2018).

One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012)

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). Research by Kunikullaya in 2017 stated that the higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat

University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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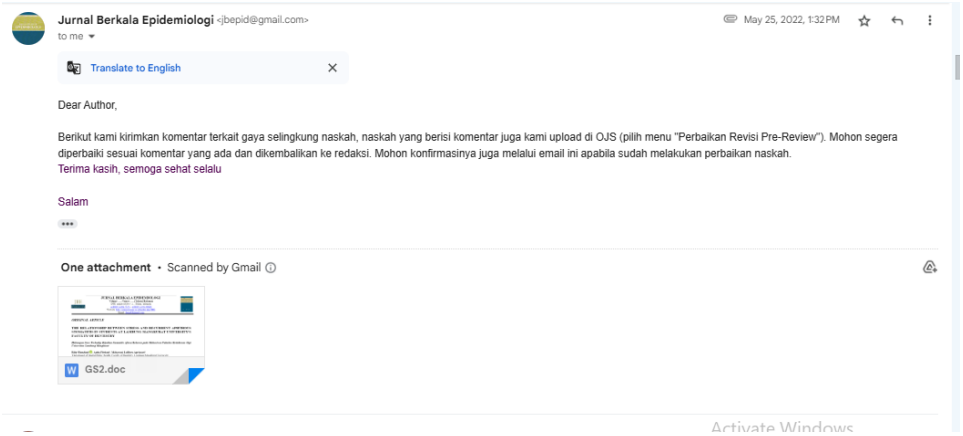
Bukti Review Kedua Gaya Selingkung (25 Mei 2022)



ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in

stress
stomatitis
oral disease
soft tissue

Kata Kunci:
Stres
Stomatitis
penyakit mulut
jaringan lunak

students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 (p <0.05). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi FKG ULM. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi FKG ULM dengan nilai signifikansi sebesar 0,01 (p<0,05).* ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

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INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018)

The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). Predisposing factors for SAR at RSGM Gusti Hasan Aman Banjarmasin showed that of 66% of SAR cases, 34% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research in Saudi Arabia ~~by Alkatheri et al.~~ states that the stress level of students majoring in dentistry is higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. Research from ~~Alhajj et al.~~ states that dental clinic students have a higher stress level than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students (Alhajj et al., 2018). Research from ~~Kwak et al.~~ stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University, with No. 013/KEPKG-FKGULM/EC/II/2021. This study used an analytic observational research design with a cross-sectional study design. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely FKG ULM professional students who have experienced recurrent aphthous stomatitis in the last 1-2 years, have no history of systemic disease, do not have allergies, not caused by trauma, and professional students who have been at professional level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire.

Data analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in

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Commented [JBE42]: Jangan disingkat

Commented [JBE38]: Mohon dijabarkan RSGM itu apa, karena tidak semua pembaca (terutama orang luar) mengerti RSGM itu apa

Commented [JBE39]: Hapus, karena penulisan sitasi sudah di akhir kalimat

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students at the Faculty of Dentistry, Lambung Mangkurat University.

The frequency distribution of respondents by gender can be seen in table 1.

RESULTS

Table 1
Gender Frequency Distribution

Gender	n	(%)
Male	9	16%
Female	48	84%
Total	80	100%

Source: Primary Data

Commented [JBE44]: Tabel 1, 2 dan 3 dijadikan 1 saja
→Gender
Male
Female
Age
Mild stress
Moderate Stress

…dst
Dan dibuat dalam bentuk tabel untuk ukuran 2 kolon (bias dilihat contihnya pada beberapa artikel kami yang sudah publish)

Table 1. shows that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. The distribution of the stress frequency of respondents can be observed in table 2.

Table 2
Distribution of respondent's stress frequency

Age	n	(%)
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Total	57	100%

Source: Primary Data

Table 2 shows that most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results. The distribution of the respondents' RAS frequency can be seen in Table 3.

Table 3
Distribution of RAS Frequency experienced by respondents

RAS	n	(%)
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

Source: Primary Data

The results of the RAS evaluation show that 40 respondents (70.18%) had a positive RAS and 17 respondents (29.82%) had a negative RAS.

The results of the stress test that have been obtained are then adjusted based on gender. In Table 4, the distribution of the stress frequency of respondents by gender can be observed.

Table 4
Distribution of Respondents' Stress Frequency by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%).

The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 5.

Table 5
Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

The results of the RAS frequency based on gender are from table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from table 6.

Commented [JBE45]: Table (T nya besar)

Table 6

The relationship between stress and recurrent aphthous stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69,23%)	4 (30,77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10,53%)	17 (89,47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

Commented [JBE46]: Penulisan angka decimal menggunakan titik. Berlaku untuk semua angka decimal (dengan dua angka di belakang koma)

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in table 7.

Commented [JBE47]: Table

Table 7
Test the association of stress on the incidence of recurrent aphthous stomatitis.

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

The results showed that students who had mild stress levels had a 7,12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19,13-times greater risk of developing RAS compared to those with severe stress levels. terkena SAR dibandingkan dengan tingkat stress berat.

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. This study is in accordance with the results of research by ~~Husada et al.~~ which measured stress levels in dentistry students, saying that moderate levels of stress were the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & E., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Research by ~~Jowkar et al.~~ stated that female dentistry students suffer from severe stress more than male students. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. Previous research from ~~Al-Johani in 2019~~ on the prevalence of recurrent aphthous stomatitis in Saudi dental students found the same thing; the RAS for females was 11.78% and 9.95% for males.RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019)

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test

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showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study by Kunikullaya et al. , which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia by Ajmal et al. showed similar results: there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012)

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). Research by Kunikullaya in 2017 stated that the higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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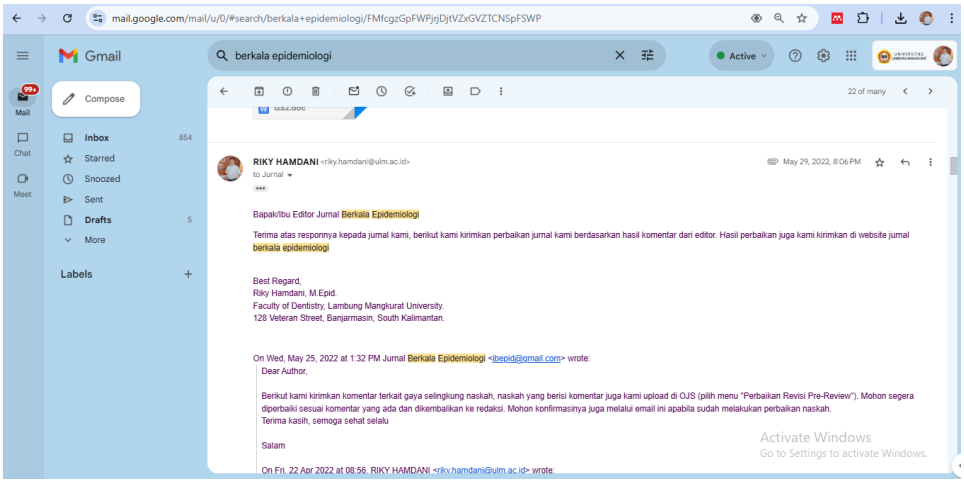

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence

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of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung*

Mangkurat dengan nilai signifikansi sebesar 0,01 (p<0,05).
Simpulan: *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34.3% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University, with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years.. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. Data analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

Source: Primary Data

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire.

The results showed that most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.2%) experiencing positive SAR and negative SAR results, with 17 respondents (29.8%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Table 2
Distribution of Respondents' Stress Frequency by Gender

	Stress Level			Total
	Mild	Moderate	Heavy	

Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%).

The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

Table 3
Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

The results of the RAS frequency based on gender are from table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

Table 4
The relationship between stress and recurrent aphthous stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5.

Table 5
Test the association of stress on the incidence of recurrent aphthous stomatitis.

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress levels.

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.8%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & Theresia Ellen., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is

more experienced by female dentistry students than males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante, Chairani, & Hestiningsih, 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.8% and in males with a percentage of 9.9%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019)

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study by Kunikullaya et al. , which stated that there was a significant relationship between stress and recurrent aphthous stomatitis

(Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia by Ajmal et al. showed similar results: there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha, Ernawati, & Hendarti, 2019; Thantawi, Khairiati, Mela, Sri, & Abu, 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012)

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). Research by Kunikullaya in 2017 stated that the higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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Bukti Review Ketiga Gaya Selingkung

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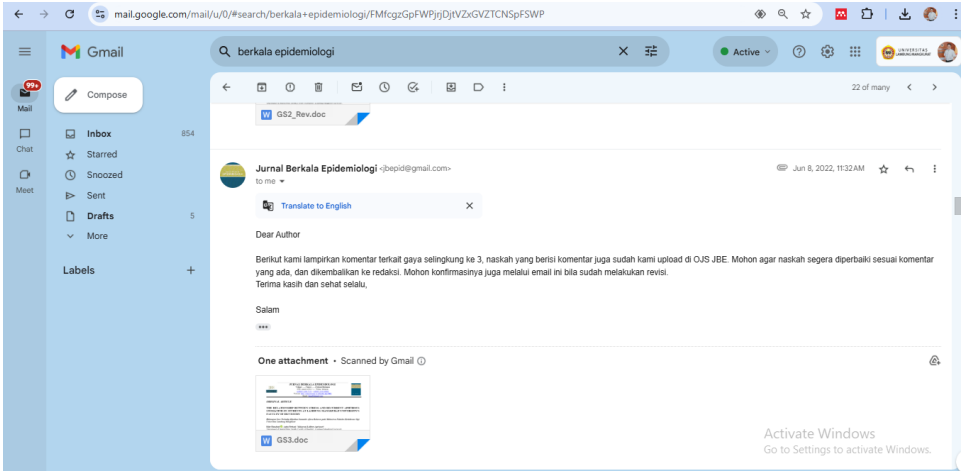

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

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Kata Kunci:
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Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan*

terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat dengan nilai signifikansi sebesar 0,01 (p<0,05).
Simpulan: *Semakin tinggi tingkat stres yang dialami akan meningkatkan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34.3% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University, with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. Data analysis in this study used the Chi-Square test to determine the correlation between stress and

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recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in Table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. ~~The results showed that~~ most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.2%) experiencing positive SAR and negative SAR results, with 17 respondents (29.8%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%).

The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

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Commented [JBE53]: **JBE NOTE:** Kami mohon ijin untuk mengubah ukuran tabel, letak tabel dan letak naskah agar tabel tidak ada yang terpotong di tengah-tengah, tanpa mengubah isi di dalamnya,

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Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

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Table 5

Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.8%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & Theresia Ellen., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is more experienced by female dentistry students than males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

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Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante, Chairani, & Hestiningsih, 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress

conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.8% and in males with a percentage of 9.9%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study by Kunikullaya et al., which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia by Ajmal et al. showed similar results: there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha, Ernawati, & Hendarti, 2019; Thantawi, Khairiati, Mela, Sri, & Abu, 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). Research by Kunikullaya in 2017 stated that the higher the level of stress experienced by a person, the more likely that

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The higher the level of stress….(Kunikullaya et al., 2017) dengan catatan tetap terdeteksi di Mendeley

person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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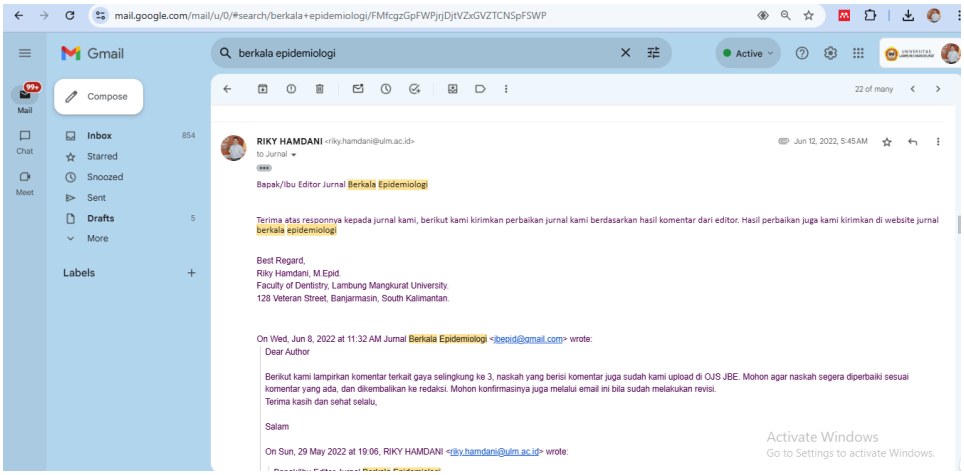

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%.*

Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat dengan nilai signifikansi sebesar 0,01 (p<0,05).
Simpulan: *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University, with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. Data

analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in Table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. Most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.18%) experiencing positive SAR and negative SAR results, with 17 respondents (29.82%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%). The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

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Table 5

Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & Theresia Ellen., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is more experienced by female dentistry students than males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante, Chairani, & Hestiningsih, 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress

conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.78% and in males with a percentage of 9.95%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study conducted in India, which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia showed similar results; there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha, Ernawati, & Hendarti, 2019; Thantawi, Khairiati, Mela, Sri, & Abu, 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). The higher the level of stress experienced by a person, the more likely that

person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

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RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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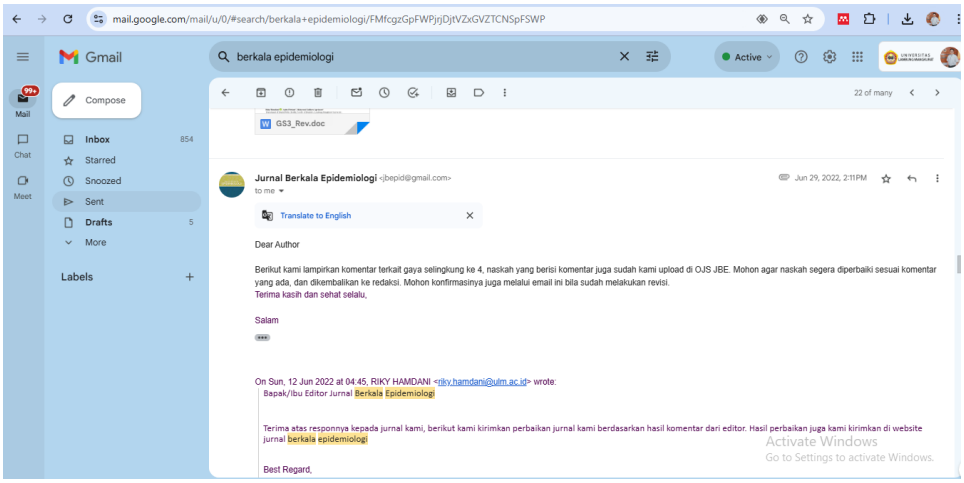
Bukti Review Keempat Gaya Selingkung (29 Juni 2022)



ORIGINAL ARTICLE

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THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

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Kata Kunci:
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Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan*

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terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat dengan nilai signifikansi sebesar 0,01 (p<0,05).
***Simpulan:** Semakin tinggi tingkat stres yang dialami akan meningkatkan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire. The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. Data analysis in this study used the Chi-Square test to determine the correlation between stress and

recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in Table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. Most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.18%) experiencing positive SAR and negative SAR results, with 17 respondents (29.82%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%). The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

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Table 5

Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & Theresia Ellen., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is more experienced by female dentistry students than males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante, Chairani, & Hestiningsih, 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress

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conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.78% and in males with a percentage of 9.95%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study conducted in India, which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia showed similar results; there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha, Ernawati, & Hendarti, 2019; Thantawi, Khairiati, Mela, Sri, & Abu, 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). The higher the level of stress experienced by a person, the more likely that

person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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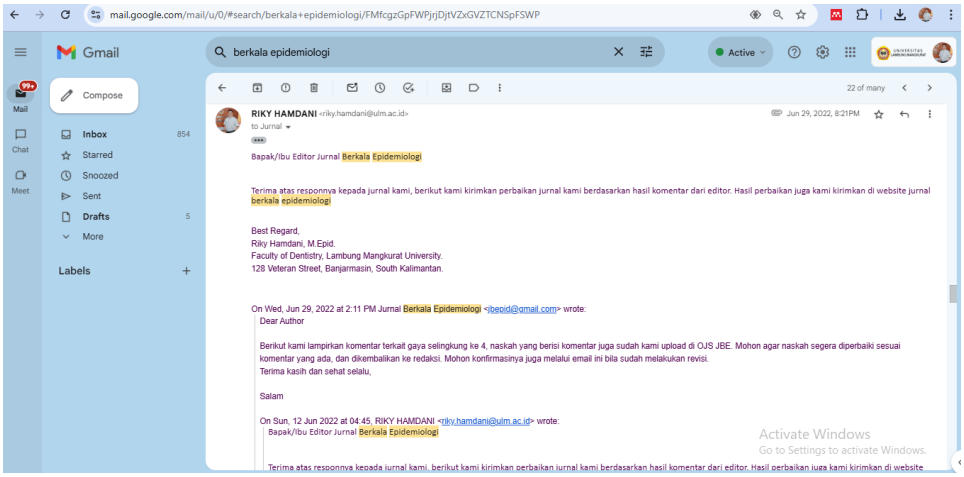

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

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Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan*

terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat dengan nilai signifikansi sebesar 0,01 (p<0,05).
***Simpulan:** Semakin tinggi tingkat stres yang dialami akan meningkatkan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire. The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. Data analysis in this study used the Chi-Square test to determine the correlation between stress and

recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in Table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. Most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.18%) experiencing positive SAR and negative SAR results, with 17 respondents (29.82%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%). The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

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Table 5

Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & Theresia Ellen., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is more experienced by female dentistry students than males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante, Chairani, & Hestiningsih, 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in

immune response and, in some cases, can cause limited mouth opening until psychological stress conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.78% and in males with a percentage of 9.95%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study conducted in India, which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia showed similar results; there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha, Ernawati, & Hendarti, 2019; Thantawi, Khairiati, Mela, Sri, & Abu, 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). The higher the level of stress

experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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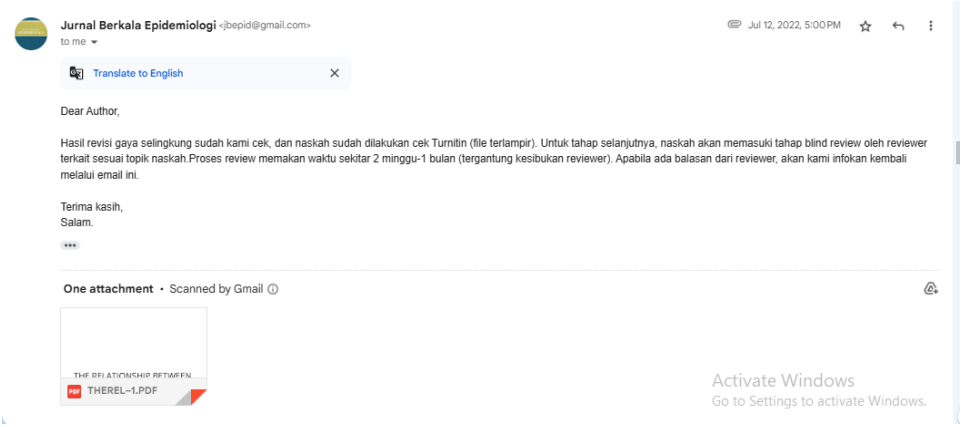

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THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

by Riky Hamdani

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ORIGINAL ARTICLE

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Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

ARTICLE INFO

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risiko kesehatan

ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel*

57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square. ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat dengan nilai signifikansi sebesar 0,01 (p<0,05).* ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years. The exclusion criteria are that

the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire. The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. Data analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in Table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. Most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.18%) experiencing positive SAR and negative SAR results, with 17 respondents (29.82%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%). The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9	22	17	48 (100%)

	(19%)	(46%)	(35%)

Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

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Table 5

Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					

Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & Theresia Ellen., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is more experienced by female dentistry students than males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante, Chairani, & Hestiningsih, 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.78% and in males with a percentage of 9.95%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The

response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study conducted in India, which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia showed similar results; there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha, Ernawati, & Hendarti, 2019; Thantawi, Khairiati, Mela, Sri, & Abu, 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). The higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

ACKNOWLEDGMENTS

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REFERENCES

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GENERAL COMMENTS

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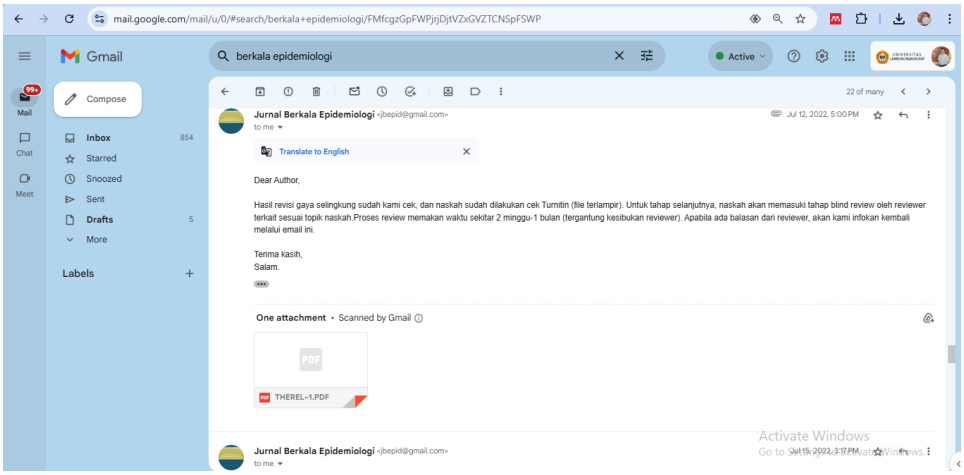
Naskah Memasuki Blind Review

(12 Juli 2022)



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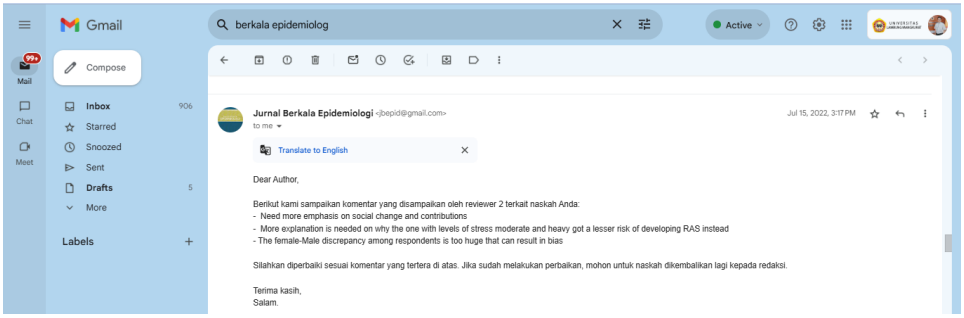

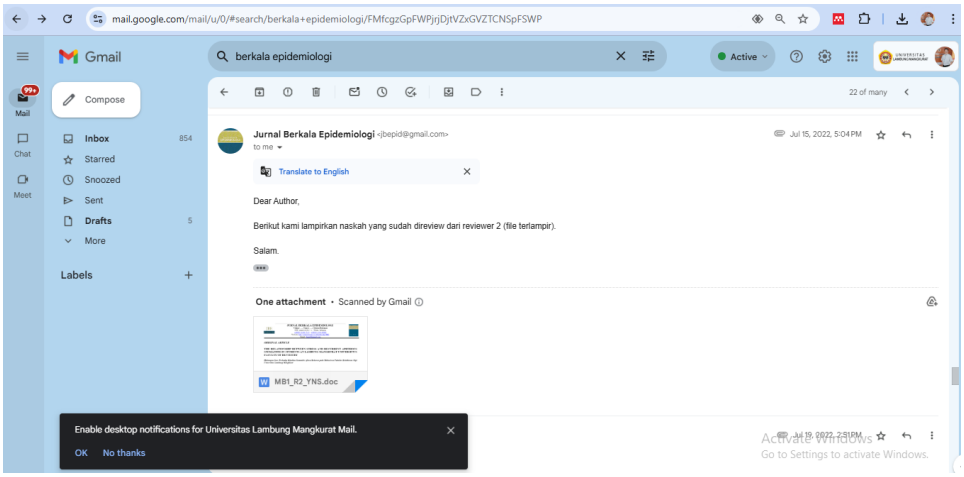

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a

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risiko kesehatan

percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in ~~co-assistants~~ of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 (p <0.05). **Conclusion:** ~~The higher~~ the level of stress experienced, ~~the higher~~ the risk to suffer from RAS

ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat dengan nilai signifikansi sebesar 0,01 (p<0,05).* ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

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INTRODUCTION

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The results of the SAR examination showed that there were 40 respondents (70.18%) experiencing positive SAR and negative SAR results, with 17 respondents (29.82%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%). The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

Commented [WU77]: Severe

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

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Table 5

Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					

Commented [WU78]: Severe

Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & Theresia Ellen., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is more experienced by female dentistry students than males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante, Chairani, & Hestiningsih, 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.78% and in males with a percentage of 9.95%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7%

(Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study conducted in India, which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia showed similar results; there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha, Ernawati, & Hendarti, 2019; Thantawi, Khairiati, Mela, Sri, & Abu, 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). The higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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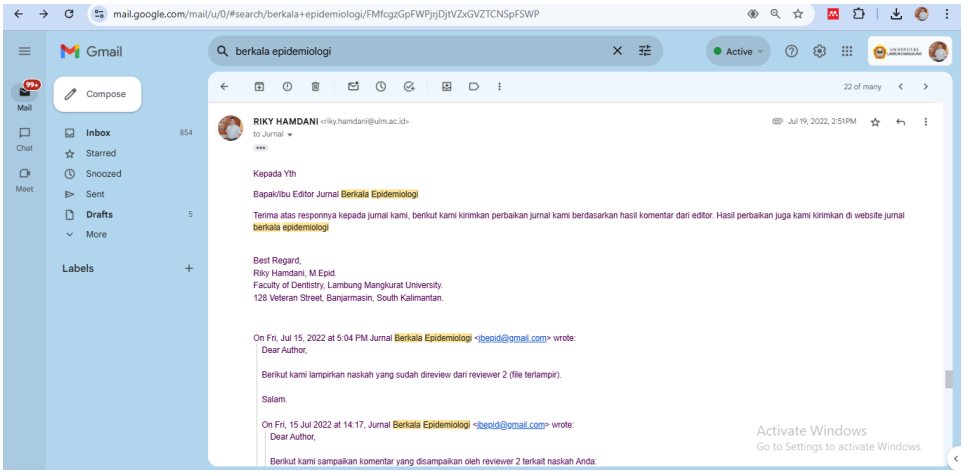

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. Stress is one of the risk factors for recurrent aphthous stomatitis. Someone who is stressed will experience a decrease in the immune system and this will result in tissue destruction in the oral cavity. **Purpose:** To

stomatitis;
oral disease;
soft tissue;
health risk

Kata Kunci:
stress;
stomatitis;
penyakit mulut;
jaringan lunak;
risiko kesehatan

analyze the relationship between stress and RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of the analysis using the chi-square test show that there is a significant relationship between stress and SAR with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The stress level affects the risk of SAR.

Commented [WU79]: Add key words ; one of keywords must be include in SDGS

Commented [RH80R79]: Health risk

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia. Stres merupakan salah satu faktor risiko terjadinya stomatitis aftosa rekuren, seseorang yang stres akan mengalami penurunan sistem imun dan berakibat dalam destruksi jaringan di rongga mulut.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR*

dengan nilai signifikansi sebesar 0,01 (p<0,05). ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color (Sari et al., 2019). These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions (Widyastutik & Permadi, 2017). RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta et al., 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari et al., 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak et al., 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire. The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The PSS questionnaire consists of 10 items. Each item is worth 0–4 points. The total score is 0-40. The results of the validity and reliability tests showed that the PSS questionnaire was valid and reliable. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. The RASDX questionnaire consists of 18 items. The

measurement results are positive and negative for SAR. The results of the validity and reliability tests showed that the RASDX questionnaire was valid and reliable. Data analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in Table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Severe Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. Most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.18%) experiencing positive SAR and negative SAR results, with 17 respondents (29.82%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%). The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)

	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Severe	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

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Table 5

Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Severe					
Mild	9	69.23	4	30.77	19.13
Severe	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Severe					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada et al., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is more experienced by female dentistry students than males. Gender differences in dealing Ajmal, M., Ibrahim, L., Mohammed, N., & Al-Qarni, H. (2018). Prevalence Psychological Stress in Recurrent Apthous Stomatitis Among Female Dental Students in Saudi Arabia. *Clujul Medical*, *91*(2), 217.

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with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar et al., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul et al., 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante et al., 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.78% and in males with a percentage of 9.95%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person

experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study conducted in India, which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya et al., 2017). Research conducted in Saudi Arabia showed similar results; there was a significant relationship between stress and RAS in dental students (Ajmal et al., 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha et al., 2019; Thantawi et al., 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel Severe, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). The higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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Review ke enam Blind Review dari Reviewer 1

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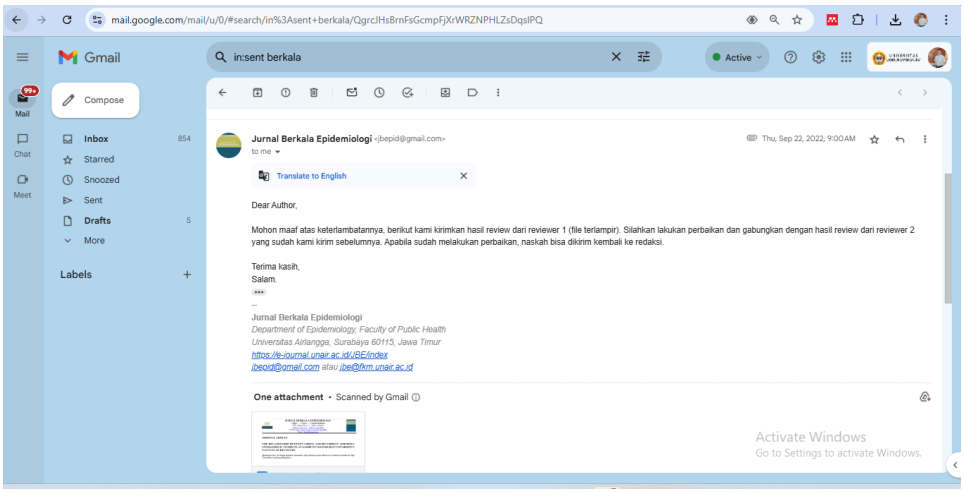

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. **Purpose:** To analyze the relationship of stress with the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using

Kata Kunci:
stress;
stomatitis;
penyakit mulut;
jaringan lunak;
risiko kesehatan

Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of chi square test analysis show that there was a significant relationship between stress and RAS in co-assistants of the Dentistry at Lambung Mangkurat University with a significance value of 0.01 (p <0.05). **Conclusion:** The higher the level of stress experienced, the higher the risk to suffer from RAS

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR pada mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat dengan nilai signifikansi sebesar 0,01 (p<0,05).* ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the

form of ulcers that are yellowish white in color. These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions. RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta, Firadaus, & Apriasari, 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari, Ernawati, & Soebadi, 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak, Y, SH, & YS, 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire. The results of the PSS questionnaire will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. Data analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

Commented [A81]: Jelaskan secara ringkas tentang kuesioner PSS dan cara pengukurannya, kenapa menggunakan 3 kategori?

RESULTS

The frequency distribution of respondents by gender can be seen in Table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Heavy Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%

Total	57	100%

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. Most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.18%) experiencing positive SAR and negative SAR results, with 17 respondents (29.82%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%). The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Heavy	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

	RAS	Total

		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Heavy	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

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Table 5

Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72

Commented [A82]: Disarankan menggunakan regresi logistic untuk memunculkan OR dan signifikansinya

Level Stress Mild and Heavy					
Mild	9	69.23	4	30.77	19.13
Heavy	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Heavy					
Moderate	6	24	19	76	2.68
Heavy	2	10.53	17	89.47	0.48 – 15.13

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress levels, with a percentage of 44%. Moderate stress is the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada, Susiana, & Theresia Ellen., 2019).

The results of this study showed that most of the male respondents experienced mild stress, with a percentage of 45%, while for female respondents it was only 19%. Moderate stress is more common in female respondents with a percentage of 46%, while for males it is only 33%. Severe stress levels in this study were more experienced by female respondents with a percentage of 35% than by males with a percentage of 22%. Stress at a severe level is more experienced by female dentistry students than males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar, Mahmoodian, & H., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul, Kolibu, & Korompis, 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18%. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante, Chairani, & Hestiningsih, 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The results of this study showed that most female respondents experienced RAS, with 71%, while male respondents experienced 67%. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.78% and in males with a percentage of 9.95%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently

Commented [A83]: - Dalam pembahasan tidak banyak mengulang hasil penelitian, lebih banyak membahas hasil temuan dari referensi yang ada
- Memperluas dan menjabarkan referensi yang lebih luas karena banyak referensi yang membahas terkait topik tersebut

reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that most of the respondents with moderate stress levels were experiencing RAS, as many as 25 respondents, with a percentage of 76%. The results of the analysis of the Chi square test showed a p value of 0.01. The figure shows alpha 0.05. So the results show that there is a relationship between stress and the incidence of RAS in dental clinic students at Lambung Mangkurat University. Similar results were also obtained by a study conducted in India, which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya, Kumar, Ananthakrishnan, & Jaisri, 2017). Research conducted in Saudi Arabia showed similar results; there was a significant relationship between stress and RAS in dental students (Ajmal, Ibrahim, Mohammed, & Al-Qarni, 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha, Ernawati, & Hendarti, 2019; Thantawi, Khairiati, Mela, Sri, & Abu, 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel heavy, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). The higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that

there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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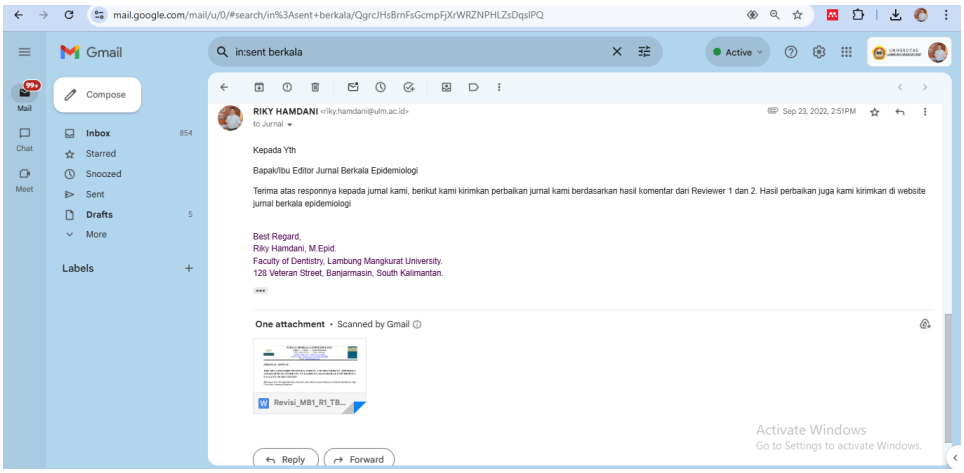
(23 September 2022)



ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS IN STUDENTS AT LAMBUNG MANGKURAT UNIVERSITY'S FACULTY OF DENTISTRY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

ARTICLE INFO

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. Based on

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Keywords:
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Kata Kunci:
stress;
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jaringan lunak;
risiko kesehatan

Basic Health Search Indonesia in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia. Stress is one of the risk factors for recurrent aphthous stomatitis. Someone who is stressed will experience a decrease in the immune system and this will result in tissue destruction in the oral cavity. **Purpose:** To analyze the relationship between stress and RAS in students of Faculty of Dentistry, Lambung Mangkurat University. **Methods:** This research is an analytic observational research with a cross sectional study design. The study used a simple random sampling technique with a total sample of 57 co-assistants of the Dentistry at Lambung Mangkurat University. RAS was examined using a questionnaire and the stress level was measured using Perceived Stress Scale (PSS) questionnaire. The results of the study were analyzed using the chi square test. **Results:** The result shows that stress level suffered by the respondents is mostly in moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.18%. The results of the analysis using the chi-square test show that there is a significant relationship between stress and SAR with a significance value of 0.01 ($p < 0.05$). **Conclusion:** The stress level affects the risk of SAR.

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ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20% dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia. Stres merupakan salah satu faktor risiko terjadinya stomatitis aftosa rekuren, seseorang yang stres akan mengalami penurunan sistem imun dan berakibat dalam destruksi jaringan di rongga mulut.* ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif*

lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR dengan nilai signifikansi sebesar 0,01 (p<0,05). ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR..*

INTRODUCTION

Recurrent aphthous stomatitis (RAS) is a common disease in the oral cavity and is an inflammation that occurs in the oral mucosa, in the form of ulcers that are yellowish white in color (Sari et al., 2019). These ulcers occur repeatedly and can be single or multiple ulcers (Widyastutik & Permadi, 2017). RAS is a disease that causes discomfort in some people because it interferes with swallowing, mastication, and speech functions (Widyastutik & Permadi, 2017). RAS consists of three types, namely minor type, major type, and herpetiform type (Hatta et al., 2018). The prevalence of recurrent aphthous stomatitis in the world is estimated to be around 20% of the total world population. Based on Riskesdas data in 2018, the prevalence of RAS was recorded at 8% of all oral health problems in Indonesia (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with a prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors are known to cause RAS. Some of these factors consist of genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The predisposing factors for SAR at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin showed that from 66% of SAR cases 34% were dominated by stress. Stress itself is one of the risk factors for RAS. This is because when a person is stressed, there will be a decrease in the immune system and this will result in tissue destruction in the oral cavity (Sari et al., 2019).

Research conducted in Saudi Arabia in 2020 stated that the stress level of students majoring in dentistry was higher than other majors. Dental students have a higher stress level than general medical students with a score of 31 (Alkatheri et al., 2020). Other majors like medical, nursing, and pharmacy majors only have a score of 27–28. Even dental students show a higher stress level than general medical students. The results of research conducted in 7 countries in 2018 stated that dental clinic students had higher stress levels than preclinical students, with a ratio of 1.17 for clinical students and 1.08 for preclinical students. (Alhajj et al., 2018). Research conducted in Korea in 2020 stated that students of the dentistry profession who underwent their professional period in the third and fourth years had high levels of fatigue (Kwak et al., 2020). The purpose of this study was to analyze whether there was a relationship between stress and recurrent aphthous stomatitis in students at Lambung Mangkurat University's Faculty of Dentistry.

METHODS

This research has received ethical approval by the ethics committee of the Faculty of Dentistry, Lambung Mangkurat University with No. 013/KEPKG-FKGULM/EC/II/2021. This research was conducted online using Google Form with 57 samples with inclusion criteria, namely clinical students of the Faculty of Dentistry, Lambung Mangkurat University, who had experienced recurrent aphthous stomatitis in the last 1-2 years, had no history of systemic disease, did not have allergies, not caused by trauma, and clinical students who had undergone clinical level for more than 2 years. The exclusion criteria are that the respondent is sick and is not willing to be a respondent.

Measurement of stress levels using the PSS questionnaire. The results of the PSS questionnaire

will be divided into 3 categories, namely mild stress, moderate stress, and severe stress. The PSS questionnaire consists of 10 items. Each item is worth 0–4 points. The total score is 0-40. The results of the validity and reliability tests showed that the PSS questionnaire was valid and reliable. The diagnosis of recurrent aphthous stomatitis was obtained using the RASDX questionnaire. The RASDX questionnaire consists of 18 items. The measurement results are positive and negative for SAR. The results of the validity and reliability tests showed that the RASDX questionnaire was valid and reliable. Data analysis in this study used the Chi-Square test to determine the correlation between stress and recurrent aphthous stomatitis in students at the Faculty of Dentistry, Lambung Mangkurat University.

RESULTS

The frequency distribution of respondents by gender can be seen in Table 1.

Table 1
Distribution of Respondent Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Severe Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

The results showed that the number of female respondents is greater, which is 48 respondents (84%), while the number of male respondents is 9 respondents (16%). The stress examination in this study used a questionnaire, which participants completed by filling out the Perceived Stress Scale questionnaire. Most of the respondents experienced moderate stress levels, with as many as 25 respondents (44%), and those who experienced the least were mild stress, with 13 respondents (22.81%). The RAS examination in this study used an instrument in the form of a recurrent apothous stomatitis diagnostic questionnaire. The results were obtained in the form of positive and negative results.

The results of the SAR examination showed that there were 40 respondents (70.18%) experiencing positive SAR and negative SAR results, with 17 respondents (29.82%). The results of the stress test that have been obtained are then adjusted based on gender. In Table 2, the distribution of the stress frequency of respondents by gender can be observed.

Most of the stress levels experienced by male respondents were mild stress levels, namely 4 respondents (45%), while most female respondents had moderate stress levels, which amounted to 22 respondents (46%). The results of the RAS examination that have been obtained are then adjusted according to gender. The distribution of respondents' RAS frequencies by gender can be observed in Table 3.

The results of the RAS frequency based on gender are from Table 5. Positive RAS results are mostly experienced by research respondents who have a female gender, namely 34 respondents with a percentage of 71%.

The results obtained from the level of stress and recurrent aphthous stomatitis of the respondents will be subjected to a chi-square test to see the relationship between stress and the incidence of RAS in dental students at Lambung Mangkurat University. The results of the chi-square test can be observed from Table 4.

The results of the research on the relationship between stress and the incidence of recurrent aphthous stomatitis showed that respondents who had the highest level of moderate stress experienced RAS, as many as 25 respondents. There were 19 respondents with severe stress who experienced RAS and 13 respondents with mild stress who experienced RAS.

Table 2
Distribution of Respondent's Stress by Gender

	Stress Level			Total
	Mild	Moderate	Severe	

Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Table 3

Frequency of Respondents to SAR by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Severe	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test showed that the p value obtained was 0.01. This figure shows an alpha value of <0.05, and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University. The test of the association of stress on the incidence of recurrent aphthous stomatitis in students of the Faculty of Dentistry, Lambung Mangkurat University, can be seen in Table 5. The results showed that students who had mild stress levels had a 7.12 times greater risk of developing RAS compared to those with moderate stress levels. Students who have mild stress levels have a 19.13 times greater risk of developing RAS compared to those with severe stress level.

Table 5
Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Severe					
Mild	9	69.23	4	30.77	19.13
Severe	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Severe					
Moderate	6	24	19	76	2.68
Severe	2	10.53	17	89.47	0.48 – 15.13

DISCUSSION

The measurement of stress levels in this study was generated using the PSS questionnaire. The results of this study indicate that most of the respondents experienced moderate stress. Moderate stress is the most common compared to others, with a percentage of 96.83%. The examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that recurrent aphthous stomatitis with positive results was mostly experienced by respondents, with a percentage of 70.18% (Husada et al., 2019).

The results of this study indicate that respondents of the female gender are more susceptible to experiencing stress in the severe category compared to males. Gender differences in dealing with stress are one of the factors that cause females to be more stressed than males, including lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing treatment clinical education period (Jowkar et al., 2020). Females are more often exposed to stress than males, also, because each person's response to stress is different and one of them depends on gender. The different levels of estrogen, oxytocin, and sex hormones in females and males make it possible for females to be more susceptible to stress than males (Jowkar et al., 2020; Kountul et al., 2018).

Examination of recurrent aphthous stomatitis in this study used the RASDX questionnaire instrument. The results of this study showed that the incidence of recurrent aphthous stomatitis in students of Faculty of Dentistry, Lambung Mangkurat University was very high. RAS has three classifications, namely, minor, major, and hepartiform RAS. The minor type can be characterised by the presence of shallow ulcers less than 1 cm in diameter and usually heals within 7–14 days. This type of SAR is covered by a yellow membrane and is surrounded by redness. Various literature states that of the three classifications of RAS, the minor type is the most common type, which is about 80% of RAS cases (Rante et al., 2019). The major type of recurrent aphthous stomatitis is the most severe of the three types of RAS. The size of the major type of SAR is 1-3 cm. The patient feels very sick, and the recovery time is longer than for minor RAS. This can take up to six weeks and can cause scarring, so the patient will feel tormented by illness, can't eat, which causes a decrease in immune response and, in some cases, can cause limited mouth opening until psychological stress conditions occur. The labial mucosa, soft palate, and palatine tonsils are the most commonly affected areas (Chiang et al., 2019).

The incidence of recurrent aphthous stomatitis in this study mostly occurred in female students. A study conducted in Saudi Arabia on the prevalence of recurrent aphthous stomatitis in dental students showed RAS in females with a percentage of 11.78% and in males with a percentage of 9.95%. RAS, which is an ulcerative condition of the oral mucosa that occurs repeatedly, is frequently reported in females. This study also states that females experience RAS the most, with a ratio of 1.2:1 (Al-Johani, 2019). This is in accordance with data from the Ministry of Health of the Republic of Indonesia in 2018 which states that females have a higher risk of being affected by RAS with a value of 9%, compared to males only around 7% (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more exposed to RAS due to the high level of anxiety in females. Females are also more likely to use their feelings when dealing with stressors, while males usually use their minds more. Females have more Adrenocorticotropic Hormone (ACTH). When ACTH is released, it stimulates the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids. The response of glucocorticoids when a person experiences stress is of several kinds, namely suppressing the body's immune function, self-protection against microbes will decrease, and the resistance of the tissue also decreases, so that it can make a person susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

The results of the study of the relationship between stress and the incidence of recurrent aphthous stomatitis showed that the incidence of RAS was mostly found in respondents who experienced moderate stress. The results of statistical test analysis using the Chi square test showed that there was a relationship between stress and the incidence of RAS in students of Faculty of Dentistry, Lambung Mangkurat University. Similar results were also obtained by a study conducted in India, which stated that there was a significant relationship between stress and recurrent aphthous stomatitis (Kunikullaya et al., 2017). Research conducted in Saudi Arabia showed similar results; there was a significant relationship between stress and RAS in dental students (Ajmal et al., 2018).

Reccurent aphthous stomatitis (RAS), which is a recurrent ulcer that affects the oral cavity without a definite cause, The causes are very multifactorial, one of which is stress or anxiety (Ganesha et al., 2019; Thantawi et al., 2014). One of the factors that destroys homeostasis in a person is stress. Each individual reacts differently when faced with stressors; some feel severe, some feel light. According to Hernawati's research on the cellular and molecular mechanisms of stress on the occurrence of recurrent aphthous stomatitis, it is stated that stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol. One part of cortisol is glucocorticoids (Purnama et al., 2021). The response of glucocorticoids when someone experiences stress is of several kinds, namely suppressing the body's immune function. Self-protection against microbes will decrease. This is what causes the resistance of the tissue to decrease, so that it can make a person susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune response due to stress can easily make microorganisms adhere to the mucosa, so that microorganisms can easily enter the mucosa. Microorganisms will also be difficult to phagocytize and will eventually lead to infection, which eventually leads to recurrent aphthous stomatitis (Ajmal et al., 2018; Neville & Allen, 2012). The higher the level of stress experienced by a person, the more likely that person will experience RAS caused by stress (Kunikullaya et al., 2017).

Based on the research, it can be concluded that the stress level suffered by the respondents is mostly in the moderate category with a percentage of 44%, while the incident of RAS with positive results is mostly experienced by respondents with a percentage of 70.2%. The results of chi-square test analysis showed that there was a significant relationship between

stress and RAS in co-assistants of dentistry at Lambung Mangkurat University with a significance value of 0.01 (p 0.05) and it can be concluded that there is a significant relationship between stress levels and the incidence of recurrent aphthous stomatitis in students of dentistry at Lambung Mangkurat University.

CONCLUSION

The results showed that there was a relationship between stress levels and the incidence of recurrent aphthous stomatitis in dental profession students at Lambung Mangkurat University. Students who have moderate to severe stress are more susceptible to recurrent aphthous stomatitis when compared to students who have mild stress. Students who have moderate-to-severe stress levels should pay more attention to providing emotional support to these students. Stress prevention programs for students also need to be carried out by the Faculty of Dentistry, Lambung Mangkurat University, one of which is by providing assistance to students in managing stress.

CONFLICT OF INTEREST

There was no conflict of interest during the conduct of the research. Starting from research licensing, research funding, and research data collection, to the preparation of research reports.

AUTHOR CONTRIBUTIONS

RH is in charge of analyzing data, presenting research results, and publishing research results. AF conducts ethical research, tests the validity and reliability of instruments, collects and processes data, and prepares reports. MLA helps coordinate research ethics tests and provides input on research results.

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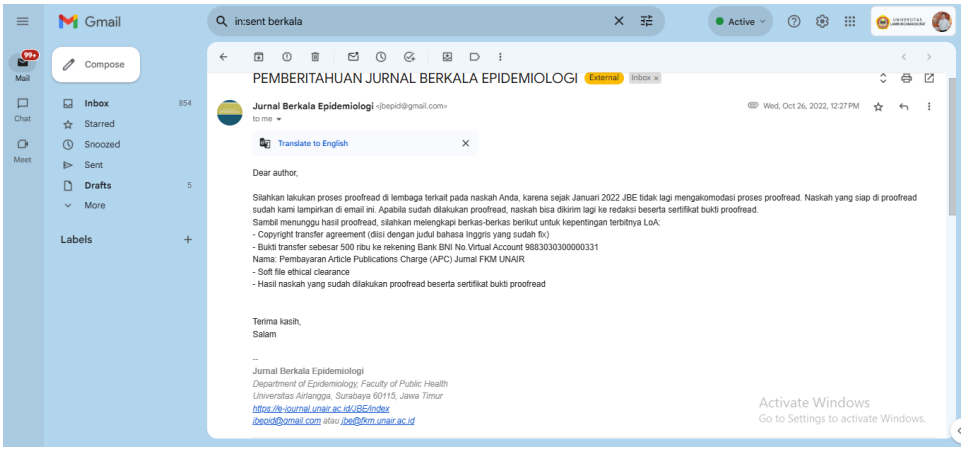

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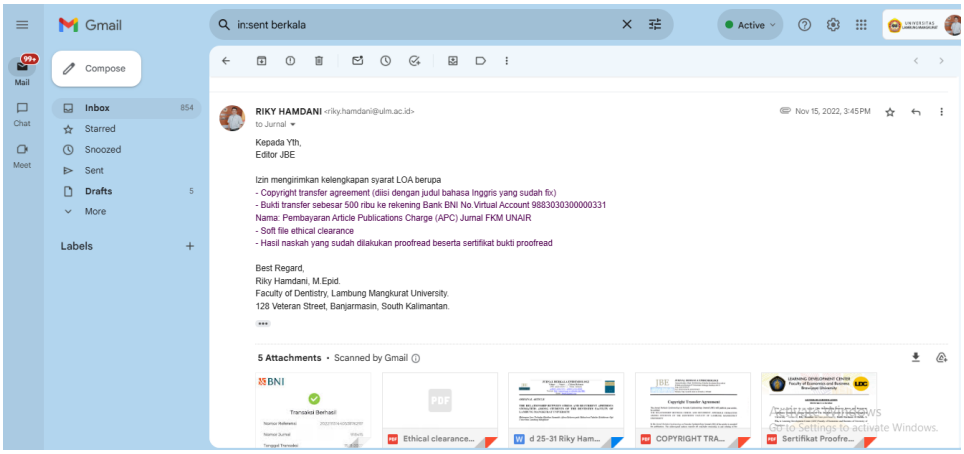
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Komisi Etik Kesehatan Fakultas Kedokteran Gigi Universitas Lambung Mangkurat dengan memperhatikan hak asasi manusia dan kesejahteraan dalam penelitian kedokteran, setelah mempelajari dengan seksama rancangan penelitian yang diusulkan, dengan ini menyatakan bahwa penelitian dengan :

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Nama Peneliti	:	Anita Fitriani
Name of the investigator		1711111320008
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Approved for ethical clearance

Banjarmasin, 18 Februari 2021
Komisi Etik Penelitian,
The ethical committe research

Hj. Ekarti Diana, Sp.KG
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NASKAH PROOREAD

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS AMONG STUDENTS OF THE DENTISTRY FACULTY OF LAMBUNG MANGKURAT UNIVERSITY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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ABSTRACT

Background: Recurrent aphthous stomatitis (RAS) is a yellowish white ulcer-shaped lesion that occurs in oral mucosa. The prevalence of RAS is estimated to be 20% of overall world population. According to Indonesia Basic Health Research, the prevalence of RAS in 2018 was at 8% of all oral health problems in the country. Stress is one of the risk factors for the disease. Distressed person decreases his immune system, resulting in oral cavity tissue destruction. **Purpose:** The objective of this research is to analyze the relationship between stress and RAS among students of Dentistry faculty, Lambung Mangkurat University. **Methods:** This analytical observational research applies cross sectional design in examining 57 co-assistants in the Dentistry Faculty of Lambung Mangkurat University, selected using simple random sampling. RAS was examined using a questionnaire, the stress level was measured using Perceived Stress Scale (PSS) questionnaire, and the resulting data were analyzed using the chi square test. **Results:** Most of the respondents have moderate stress (44%), and most of them (70.18%) are RAS positive. The results of the chi-square suggest the significant relationship between stress and RAS at the significance value of 0.01 ($p < 0.05$). **Conclusion:** Stress level affects the risk of RAS.

ABSTRAK

Latar Belakang: *Stomatitis Aftosa Rekuren (SAR) merupakan lesi berbentuk ulser berwarna putih kekuningan terjadi di mukosa mulut. Prevalensi SAR di dunia diperkirakan rata-rata berkisar sebesar 20%*

dari total populasi dunia. Berdasarkan data Riskesdas tahun 2018 untuk prevalensi SAR tercatat sebanyak 8% dari seluruh masalah kesehatan mulut di Indonesia. Stres merupakan salah satu faktor risiko terjadinya stomatitis aftosa rekuren, seseorang yang stres akan mengalami penurunan sistem imun dan berakibat dalam destruksi jaringan di rongga mulut. ***Tujuan:*** *Menganalisis hubungan stres pada mahasiswa profesi Kedokteran Gigi Universitas Lambung Mangkurat terhadap kejadian SAR.* ***Metode:*** *Penelitian ini merupakan jenis penelitian observasional analitik dengan desain studi cross sectional. Teknik pengambilan sampel pada penelitian menggunakan teknik simple random sampling dengan jumlah sampel 57 mahasiswa profesi Fakultas Kedokteran Gigi Universitas Lambung Mangkurat. Pemeriksaan SAR menggunakan kuesioner dan pengukuran tingkat stres menggunakan kuesioner Perceived Stres Scale (PSS). Hasil penelitian dianalisis menggunakan uji chi square.* ***Hasil:*** *Hasil penelitian menunjukkan tingkat stres yang paling banyak diderita oleh responden adalah tingkat sedang dengan presentase sebesar 44%, sedangkan untuk kejadian SAR dengan hasil positif lebih banyak dialami oleh responden dengan presentase 70,18%. Hasil analisis dengan menggunakan uji chi square menunjukkan terdapat hubungan yang signifikan antara stres terhadap SAR dengan nilai signifikansi sebesar 0,01 (p<0,05).* ***Simpulan:*** *Semakin tinggi tingkat stres yang dialami akan meningkatakan risiko timbulnya SAR.*

INTRODUCTION

Recurrent aphthous stomatitis (RAS), a common disease in oral cavity, is an inflammation in the oral mucosa in the form of yellowish white ulcers (Sari et al., 2019) which occurs repeatedly, either single or multiple (Widyastutik & Permadi, 2017). The disease causes discomfort in some people because it interferes with swallowing, mastication, and speech functions (Widyastutik & Permadi, 2017). Consisting of minor, major, and herpetiform types (Hatta et al., 2018), its prevalence in the world is estimated to be around 20% of the total world population. Based on the Riskesdas (Indonesian Basic Health Research) 2018 data, the prevalence in the country was 8% of all oral health problems (Kementerian Kesehatan Republik Indonesia, 2018). RAS was the most common type of oral mucosal disease at Gusti Hasan Aman Dental and Oral Hospital Banjarmasin from 2014 to 2017, with the prevalence of 45.42% out of 397 patients in 2018 (Hatta et al., 2018).

Many factors known to cause RAS are genetics, allergies, stress, trauma (sores in the mouth), and hormonal imbalances (Widyastutik & Permadi, 2017). The most predisposing factor for 66% RAS cases at Gusti Hasan Aman Oral and Dental Hospital Banjarmasin is stress (34%) since it can decrease human's immune system causing tissue destruction in the oral cavity (Sari et al., 2019).

A research conducted in Saudi Arabia in 2020 found that the stress level of students majoring in dentistry was higher than those of other majors. As the former have the score of 31 (Alkatheri et al., 2020), the latter, i.e. students of medical, nursing, and pharmacy, have the scores between 27–28. Further, a research conducted in seven countries in 2018 found that clinical dental students have a higher stress level than preclinical students with the ratio of 1.17 and 1.08 (Alhajj et al., 2018), while a

similar research in Korean context in 2020 concluded that students of dentistry profession undergone their professional period in the third and fourth years have a high level of fatigue (Kwak et al., 2020). Hence, the purpose of this study is to analyze the relationship between stress and RAS among dental students of Lambung Mangkurat University.

METHODS

This research has received its ethical approval from the ethical committee of the Dentistry faculty of Lambung Mangkurat University through the letter number 013/KEPKG-FKGULM/EC/II/2021. The data of this research was harvested by conducted online surveys using Google Forms. The samples were selected with the criteria of clinical students of the Dentistry Faculty of Lambung Mangkurat University who had RAS in the last 1-2 years not caused by trauma but have no history of systemic disease. They must have no allergies and must be clinical students who had undergone clinical level for more than 2 years. With the exclusion criteria of having illness and unwilling to be a respondent, 57 people were selected as the respondents.

The respondents' stress level was measured using the PSS questionnaire, whose results were divided into three categories: mild, moderate, and severe. The questionnaire consists of 10 items. As each item ranges from zero to four points, the total score is between zero and forty. The results of the validity and reliability tests indicated that the questionnaire was valid and reliable. The diagnosis of RAS was obtained using RASDX questionnaire. This questionnaire consists of 18 items, intended to indicate RAS positive or negative. The results of the validity and reliability tests showed that the RASDX questionnaire was valid and reliable. The data of this study were analyzed using the Chi-Square test, which determines the correlation between stress and RAS in question.

RESULTS

The characteristics of the respondents can be seen in Table 1.

Table 1

Distribution of Respondent's Characteristics

Variable	n	(%)
Gender		
Male	9	16%
Female	48	84%
Stress		
Mild Stress	13	22.81%
Moderate Stress	25	43.86%
Severe Stress	19	33.33%
Recurrent aphthous stomatitis		
Negative	17	29.82%
Positive	40	70.18%
Total	57	100%

The table shows that most of the respondents are female (48 people or 84% of total sample), while male respondents are only nine people or respondents 16%. The stress level of the respondents was measured using the Perceived Stress Scale questionnaire. Most of the respondents are moderate in terms of stress levels (25 people or 44%). The smallest portion is for mild stress, experienced by 13 respondents or 22.81%. RAS was examined using the Recurrent Apothous Stomatitis Diagnostic questionnaire, resulting in positive or negative. The results show that 40 respondents (70.18%) are RAS positive, while the remaining 17 people (29.82%) are negative. The results of the stress test were then adjusted based on gender.

In Table 2, the distribution of the stress frequency of the respondents by their gender was observed. Most of male respondents had mild stress (4 people or 45%), while most female respondents had moderate stress (22 people of 46%). The results of the RAS examination above were then adjusted according to respondent's gender. The distribution of respondents' RAS frequencies by gender is presented in Table 3.

The results of the RAS frequency based on the gender are available in Table 5. Positive RAS is mostly experienced by females, i.e. 34 people or 71%.

The respondents' stress level and RAS diagnosis will be subjected to a chi-square test to see the relationship between stress level and RAS incident among the respondents. The results of the test is provided in Table 4.

Based on Table 4, the most combination between stress and RAS was found in people with moderate stress (25 people), followed by severe stress (19 people), and mild stress (13 people).

Table 2
Distribution of Respondent's Stress by Gender

		Stress Level			Total
		Mild	Moderate	Severe	
Gender	Male	4 (45%)	3 (33%)	2 (22%)	9 (100%)
	Female	9 (19%)	22 (46%)	17 (35%)	48 (100%)

Source: Primary Data

Table 3

Frequency of Respondents to RAS by Gender

		RAS		Total
		Positive	Negative	
Gender	Male	6 (67%)	3 (33%)	9 (100%)
	Female	34 (71%)	14 (29%)	48 (100%)

Source: Primary Data

Table 4

The Relationship between Stress and Recurrent Aphthous Stomatitis

		RAS		Total	*p-value*
		Negative	Positive		
Level Stress	Mild	9 (69.23%)	4 (30.77%)	13 (100%)	0.01
	Moderate	6 (24%)	19 (76%)	25 (100%)	
	Severe	2 (10.53%)	17 (89.47%)	19 (100%)	
	Total	17 (100%)	40 (100%)	57 (100%)	

Source: Primary Data

The results of the analysis of the Chi square test show that the p value is 0.01, which is smaller than the alpha value of 0.05. Hence, it can be concluded that there is a significant relationship between stress levels and the incidence of RAS in the dental students of Lambung Mangkurat University. The test of the effect of stress on the incidence of RAS among the students can be seen in Table 5. The results show that students who had mild stress had a 7.12 times greater risk of having RAS compared to those with moderate stress. Further, students with mild stress have a 19.13 times greater risk of developing RAS compared to those with severe stres

Table 5
Test the association of stress on the incidence of recurrent aphthous stomatitis

Variable	RAS				OR (95%CI)
	Negative		Positive		
	n	%	n	%	
Level Stress Mild and Moderate					
Mild	9	69.23	4	30.77	7.125
Moderate	6	24	19	76	1.60 – 31.72
Level Stress Mild and Severe					
Mild	9	69.23	4	30.77	19.13
Severe	2	10.53	17	89.47	2.92 – 125.32
Level Stress Moderate and Severe					
Moderate	6	24	19	76	2.68
Severe	2	10.53	17	89.47	0.48 – 15.13

DISCUSSION

The measurement of stress level in this study was conducted using the PSS questionnaire, resulting in that the most common type of stress experienced by the respondents is moderate, i.e. 96.83%. Meanwhile, the diagnosis for RAS in this study used the RASDX, suggesting that most of the respondents (70.18%) had RAS (Husada et al., 2019). Furthermore, differences between genders in regards to their way of dealing with stress are one of the factors that cause females to be more vulnerable to severe stress. This can be worsen by other factors such as the lack of confidence to become a dentist, feelings of fear of failure, academic factors, education at the clinical level, and handling patients while undergoing clinical treatment education period (Jowkar et al., 2020). The different levels of estrogen, oxytocin, and sex hormones in females and males make females more susceptible to stress than males (Jowkar et al., 2020; Kountul et al., 2018).

The data obtained from the survey using RASDX indicate that the incidence of RAS among students in the Dentistry faculty of Lambung Mangkurat University was very high. RAS has three classifications: minor, major, and hepartiform. The minor type is characterized by the presence of shallow ulcers of less than 1 cm in diameter which usually heal within 7–14 days. This type of RAS is covered by a yellow membrane and is surrounded by redness. Various sources state that, of the three classifications of RAS, the minor type is the most common, about 80% of all RAS cases (Rante et al., 2019). The major type of RAS is the most severe of the three types. The diameter of the ulcer is 1 to 3 cm. compared to the minor RAS, this causes much more pain, takes longer time to heal (up to six weeks), and can cause scarring, so the patient will have difficulty to eat, which causes a decrease in immune response and, in some cases, limit mouth opening until psychological stress conditions occur. The labial mucosa, soft palate, and palatine tonsils are

the most commonly affected areas (Chiang et al., 2019).

RAS in this study is mostly suffered by female students. A study conducted in Saudi Arabia found that the prevalence of RAS in dental students is 11.78% for females and 9.95% for males. This study also discovered that females experience RAS more with the ratio of 1.2:1 (Al-Johani, 2019). This is consistent with data released by the Ministry of Health of the Republic of Indonesia in 2018 that females are 9% more vulnerable to RAS than males, who have 7% of vulnerability (Kementerian Kesehatan Republik Indonesia, 2018).

Females are more inclined to RAS due to their high level of anxiety. As they are more likely to use their feelings when dealing with stressors, their counterparts tend to use their logics. Then, females have more Adrenocorticotropic Hormone (ACTH) than males. When ACTH is released, it stimulates the adrenal cortex to produce cortisol, which contains glucocorticoids. The bodily response of glucocorticoids is that, if a person experiences stress, his immune function will be suppressed, or his self-protection against microbes and tissue resistance will be hindered. As a result, he will susceptible to infection (Purnama et al., 2021; Sari et al., 2019).

Further, in this research, RAS was mostly found in respondents with moderate stress. The results of the Chi square test indicate that there is a relationship between stress and RAS among dental students. This finding is in agreement with the result of a study conducted in India (Kunikullaya et al., 2017) and Saudi Arabia (Ajmal et al., 2018).

RAS is a recurrent ulcer that affects oral cavity without a definite cause. The causes are very multifactorial; one of which is stress or anxiety (Ganesha et al., 2019; Thantawi et al., 2014). One of the factors that destroys homeostasis in a person's body is stress. Each individual reacts differently when faced with stressors; some feel a severe symptom, some feel mild one. According to Hernawati's research on the relationship between cellular and molecular mechanisms of stress and the occurrence of RAS, stress conditions activate the central nervous system (CNS), causing the hypothalamus to release corticotropin hormone (CRH). The released CRH will stimulate the pituitary gland to release Adrenocorticotropic Hormone (ACTH). When ACTH is released, it will stimulate the adrenal cortex to produce cortisol, which contains glucocorticoids (Purnama et al., 2021). The bodily response of glucocorticoids is that, if a person experiences stress, his immune function will be suppressed, or his self-protection against microbes and tissue resistance will be hindered. As a result, he will susceptible to infection (Glick, 2015; Neville & Allen, 2012).

Decreased immune due to stress can make microorganisms adhere to the mucosa easily, so microorganisms can freely enter the mucosa. Microorganisms will also be difficult to phagocytize, eventually leading infections, such as RAS (Ajmal et al., 2018; Neville & Allen, 2012). The higher a person's stress level, the more the likeliness of that person to have RAS (Kunikullaya et al., 2017).

Based on the explanation above, it can be concluded that the stress level of the respondents is mostly moderate (44%), and most of them (70.2%) are RAS positive. The results of the Chi-square analysis show that there is a significant relationship between stress and RAS suffered by co-assistants at the Dentistry Faculty of Lambung Mangkurat University with the significance value of 0.01 (p 0.05).

CONCLUSION

The results of the analyses show that there is a relationship between stress levels and the incidence of RAS among dental students at Lambung Mangkurat University. Students with moderate to severe stress are more susceptible to RAS compared to those with mild stress. Therefore, students with moderate to severe stress should be given more attention by providing emotional support. The Dentistry faculty of Lambung Mangkurat University need to

provide stress prevention programs for students in forms of stress management assistance.

CONFLICT OF INTEREST

There was no conflict of interest when this research was conducted, either in research licensing, research funding, research data collection, or research report preparation .

AUTHOR CONTRIBUTIONS

RH was in charge of analyzing the data, presenting the research results, and publishing them. AF was responsible for research ethical consideration, instrument validity and reliability assessment, data collection and processing, and report preparation. MLA coordinated the research ethics tests and provided input on the research results.

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LETTER OF CERTIFICATION
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This is to certify that the text entitled **"The Relationship Between Stress and Recurrent Aphthous Stomatitis among Students of The Dentistry Faculty of Lambung Mangkurat University "** written by **Riky Hamdani** has been proofread by **Habib Rachman Al Hafidz, S. Pd.**, in Learning Development Center (LDC) Faculty of Economics and Business of University of Brawijaya.

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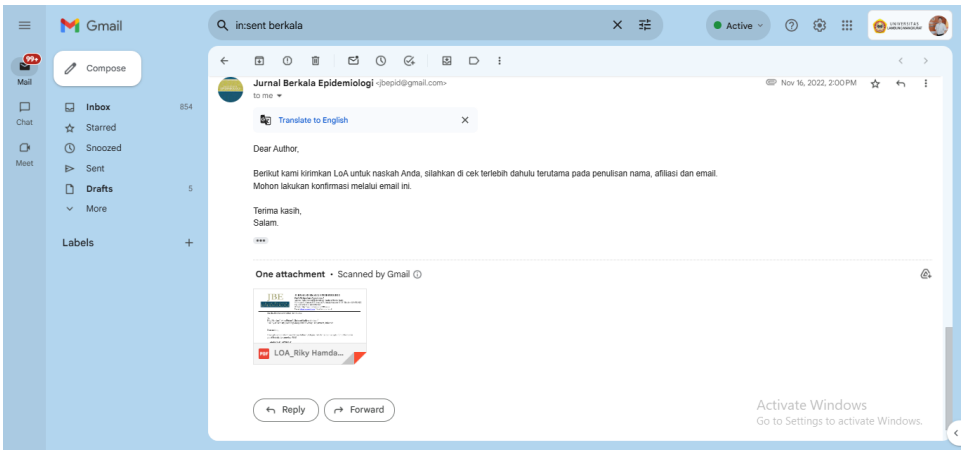

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To,
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Dear authors,

I have pleasure to inform you that your following Original Article has been accepted for publication in Jurnal Berkala Epidemiologi (JBE)

ORIGINAL ARTICLE

THE RELATIONSHIP BETWEEN STRESS AND RECURRENT APHTHOUS STOMATITIS AMONG STUDENTS OF THE DENTISTRY FACULTY OF LAMBUNG MANGKURAT UNIVERSITY

Hubungan Stres Terhadap Kejadian Stomatitis Aftosa Rekuren pada Mahasiswa Fakultas Kedokteran Gigi Universitas Lambung Mangkurat

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With regards
Yours sincerely

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