



International Journal of Applied Dental Sciences

ISSN Print: 2394-7489
ISSN Online: 2394-7497
IJADS 2025; 11(2): 325-328
© 2025 IJADS
www.oraljournal.com
Received: 12-04-2025
Accepted: 16-05-2025

Siska Ella Natassa
Department of Public Health
Dentistry, Preventive, Faculty
of Dentistry, Universitas
Sumatera Utara, Medan,
Indonesia

Ade Fatimah Azzahra
Clerkship Student, Universitas
Sumatera Utara, Medan,
Indonesia

Aulia Farhan
Clerkship Student, Universitas
Sumatera Utara, Medan,
Indonesia

Rahel Sukma
Clerkship Student, Universitas
Sumatera Utara, Medan,
Indonesia

Revina Angelia
Clerkship Student, Universitas
Sumatera Utara, Medan,
Indonesia

The relationship between stress and the incidence of recurrent Aphthous stomatitis in clinical clerkship student

**Siska Ella Natassa, Ade Fatimah Azzahra, Aulia Farhan, Rahel Sukma
and Revina Angelia**

DOI: <https://www.doi.org/10.22271/oral.2025.v11.i2e.2170>

Abstract

Stress is a common and unavoidable condition experienced in daily life. It is frequently associated with a decline in overall health and the manifestation of various disorders, including those affecting the oral cavity. One of the most prevalent oral conditions observed in individuals experiencing stress is Recurrent Aphthous Stomatitis (RAS). This study aimed to analyze the relationship between stress and the incidence of RAS.

Methods: This study is an analytical study with a cross-sectional design and with a purposive sampling technique. Respondents in this study were those who experienced RAS or had experienced RAS in the last 1 month. The questionnaire to assess stress perception was *Perceived stress scale 10* (PSS-10) and the questionnaire to assess RAS perception using RASDX. The results obtained were analyzed with the chi-square test.

Results: The results showed that 22.6% of respondents experienced severe stress and 83.5% experienced RAS. Statistical test results with chi-square showed an association between stress and the incidence of RAS ($P=0.0001$).

Conclusion: There is a relationship between stress and the incidence of RAS, it can be concluded that people who experience stress tend to experience RAS.

Keywords: Stress, Recurrent Aphthous Stomatitis (RAS), Perceived Stress Scale (PSS), RASDX

Introduction

Stress is a condition that often occurs in everyday life that cannot be avoided and will be experienced by everyone. Stress is normal for every individual and an integral part of life, but the conditions that are attributed as stress to one person can be different for another ^[1, 2].

Approximately 350 million individuals worldwide are affected by stress, prompting the World Health Organization (WHO) to classify it as the fourth most prevalent health condition globally. Stress is often linked to a decline in the body's overall health and the appearance of diseases or conditions, including oral health problems. Various manifestations of stress in the oral cavity include temporomandibular joint disorders, Oral Lichen Planus (OLP), burning mouth syndrome (BMS), myofascial pain dysfunction syndrome (MPDS), bruxism, dental caries / dental attrition / dental erosion, xerostomia and the most common conditions observed in individuals experiencing stress is Recurrent Aphthous Stomatitis (RAS), with stress also recognized as a significant predisposing factor for its occurrence ^[7, 8].

One group of individuals who may experience stress is university students undergoing academic coursework. Globally, the prevalence of stress among students ranges from 38% to 71%. In Indonesia, the incidence of stress among university students ranges from 36.7% to 71.6% ^[3].

The academic demands that must be faced and the unpreparedness of individuals to deal with them can result in psychological disorders such as stress. The most common stress experienced by students is academic stress. Academic stress is academic-related demands that exceed students' adaptive abilities. It is estimated that 10-30% of students experience some level of academic stress during their academic career ^[4, 5].

Corresponding Author:
Ade Fatimah Azzahra
Clerkship Student, Universitas
Sumatera Utara, Medan,
Indonesia

Research by Koochaki *et al.* in 2011 has reported a high prevalence of stress among medical students ranging from 25-90% [5]. Based on a research by Kurniasih I *et al.* in 2018, dental students have a prevalence of stress of 70%-100% [6].

During dental students' education, they are exposed to various stressors such as heavy workload, schedule pressure, and the need to manage learning basic knowledge and mastering clinical technical skills. At the clinical stage, additional triggers arise such as dealing with patients, patient care responsibilities, and difficulties in acquiring manual skills [6-8]. Recurrent Aphthous Stomatitis (RAS) is the most common oral mucosal disease characterized by single or multiple, recurrent, small, round or oval ulcers with well-defined reddish borders and a gray or yellow base [9]. The prevalence of RAS in the world population is around 20%.

The etiology and pathogenesis of RAS are still unknown, but there are several factors predisposing to RAS, namely genetic factors, allergies, stress, trauma, hormonal imbalance. Sulistiani *et al.* (2017) reported that stress was the most significant predisposing factor for Recurrent Aphthous Stomatitis (RAS), accounting for 43.3% of cases. In comparison, trauma-related factors accounted for 29.1%, while other factors contributed 10% [10].

A study by Utmi *et al.* (2023) on the relationship between stress and quality of life in the incidence of Recurrent Aphthous Stomatitis (RAS) among undergraduate students of the Faculty of Dentistry at Baiturrahmah University found that 78.3% of students who had experienced RAS reported severe stress [11].

Therefore, the researcher is interested in conducting this study with the aim of analyzing the relationship between stress and the incidence of Recurrent Aphthous Stomatitis (RAS) among clinical clerkship students at the Faculty of Dentistry, Universitas Sumatera Utara.

Materials and Methods

This study is an analytical study with a cross-sectional design. The study population was 128 clinical clerkship students at the Faculty of Dentistry, USU. Participants were selected using purposive sampling based on the following criteria: respondents who were currently experiencing or had experienced Recurrent Aphthous Stomatitis (RAS) within the past month (≤ 1 month), did not use orthodontic appliances or dentures, had no history of allergies or systemic diseases, were not taking any medications, and were not menstruating at the time of the study. Stress was measured using the Perceived Stress Scale (PSS) questionnaire, which consists of 10 items scored on a Likert scale. However, items 4, 5, 7, and 8 were reverse-scored, with the following values: 0=4, 1=3, 2=2, 3=1, and 4=0. The total scores were summed and categorized as follows: mild stress (0-13), moderate stress (14-26), and severe stress (27-40). The presence of Recurrent

Aphthous Stomatitis (RAS) was assessed using the RASDX questionnaire. A positive RAS diagnosis required affirmative responses to all five major criteria and at least seven out of twelve minor criteria. A negative diagnosis was assigned if the respondent answered negatively to any one of the five major criteria or affirmatively to fewer than seven minor criteria. Data analysis was conducted using the Chi-Square test to evaluate the association between stress levels and the incidence of RAS.

Results

Table 1: Distribution of respondent characteristics (N=128)

Respondents characteristic	Frequency	Percentage
Age		
21-22 years old	16	12,5
23-24 years old	94	73,43
25-26 years old	15	11,71
27-28 years old	3	2,34
Gender		
Male	23	17,96
Female	105	82,03
Current Department		
Oral Surgery	10	7,81
Conservation	10	7,81
Periodontia	4	3,12
Radiology	6	4,68
DPH	5	3,9
Prosthodontia	57	44,53
Pedodontia	6	4,68
Public Health	13	10,15
Non-Lab	17	13,28

The results indicated that the majority of respondents (73.43%) were aged 23 to 24 years. Female participants constituted the predominant gender at 82.03%. Additionally, the largest proportion of respondents were currently enrolled in the Prosthodontics department, accounting for 44.53%. The results revealed that among clinical clerkship students at the Faculty of Dentistry, University of North Sumatra, moderate stress was most prevalent (53.9%), followed by mild stress (23.4%) and severe stress (22.6%).

Table 2: Frequency distribution based on stress level (N=128)

Stress Level	N	Percentage
Mild	30	23,4
Moderate	69	53,9
Severe	29	22,6

The results of the RASDX questionnaire showed that nearly 100% of respondents answered 'yes' to all major criteria statements. For the minor criteria, 100% reported that their mouth ulcers first appeared before the age of 25, 97.65% confirmed having experienced mouth ulcers previously, and 88.28% indicated having fewer than five ulcers per episode.

Table 3: Frequency distribution of RASDX questionnaire statements (N=128)

Statement	Frequency			
	Yes	No		
	N	%	N	%
Major Criteria				
The RAS is painful (especially when exposed to food or when talking)	126	98,43	2	1,56
Recurrent mouth ulcers (at least 2 mouth ulcers so far)	121	94,53	7	5,46
Mouth ulcers is usually always on the inside of the mouth and never on the outside of the lips.	128	100,0	0	0
Mouth ulcers experienced are in ulcer form and are not fluid-filled lesions that can burst	123	96,09	5	3,90
Mouth ulcersexperienced usually occurs suddenly and without a definite cause.	111	86,71	17	13,28
Minor Criteria				
You were told by your doctor/dentist about mouth ulcers in your mouth	50	39,09	78	60,93
Mouth ulcers first appeared at the age of <25 years old	128	100,0	0	0
Mouth ulcers never occur on hard tissue (e.g. on the palate or underside of teeth)	86	67,18	42	32,81
Mouth ulcers usually occurs on the inner lips and inner cheeks.	91	71,09	37	28,90
Mouth ulcers experienced usually appears in a different area than before (can also occur in the same place)	83	64,84	45	39,06
Mouth ulcers occurred in areas that are rarely bitten (e.g. gums, under the tongue, crease between the teeth and lips, crease between the teeth and cheeks)	78	60,93	50	39,06
The mouth ulcer you experienced was not always caused by biting. If the mouth ulcer started because of biting, the pain usually continues to persist. You believe that the mouth ulcer you experienced is different from wounds or lesions caused by biting.	97	75,78	31	24,21
If the mouth ulcers is <1 cm, it will resolves in less than 2 weeks	101	78,90	27	21,09
Mouth ulcers not always associated with other conditions (e.g. fever or sores on the skin or other areas).	98	76,56	32	25,0
Have you experienced more than 5 episodes of mouth ulcers in your lifetime?	89	69,53	39	30,46
Having < 5 mouth ulcers in each episode	113	88,28	15	11,71
Have ever experienced mouth ulcers (known based on information from other people, books and internet).	125	97,65	3	2,34

Table 4: Frequency distribution based on RAS occurrence (N=128)

RAS	N	Percentage
Positive	107	83,59
Negative	21	16,4
Total	128	100

The results indicated that a majority of clinical clerkship students at the Faculty of Dentistry, University of North Sumatra, tested positive for Recurrent Aphthous Stomatitis (RAS) at 83.59%, while 16.4% tested negative.

Table 5: Frequency distribution based on the relationship of stress level of RAS Events (N=128)

Stress Level	N	Positive N (%)	Negative N (%)	P-Value
Lightweight	30	18 (60%)	12 (40%)	0.0001
Medium	69	62 (89.9%)	7 (10.1%)	
Weight	29	27 (93.1%)	2 (6.9%)	

The results showed that there was a relationship between stress level and the incidence of RAS with a p value of 0.0001.

Discussion

Stress is defined as pressure or anxiety caused by problems in an individual's life. Various factors can contribute to stress and anxiety among dental professional students, including the demands to be more active in the learning process, finding patients who meet the minimum requirements, and directly managing patients while being responsible for their safety. Additionally, dental students must face examinations and fulfill graduation requirements for each clinical rotation. They are required to be proficient in applying all the material learned during the preclinical phase. These conditions can act as stressors, leading to stress, anxiety, and even depression. Stressful conditions will trigger the activation of the *Hypothalamic Pituitary Adrenal* or (HPA) axis to release *Corticotropin Releasing Hormone* (CRH) which will trigger the secretion and release of other hormones such as *Adrenocorticotropin hormone* (ACTH) from the pituitary

gland which is also located in the brain. The ACTH hormone will follow the bloodstream and reach the adrenal glands and trigger the secretion of stress hormones such as glucocorticoids (cortisol in humans) and catecholamines or (adrenaline and non-adrenaline) which can affect oral health. Recurrent Aphthous Stomatitis (RAS) is an oral disease with an uncertain etiology, although stress is suspected to be one of its predisposing factors. RAS presents as oval-shaped ulcers on the oral mucosa, characterized by recurrent episodes without association with other diseases. It is considered one of the most painful conditions affecting the oral mucosa, particularly during eating, swallowing, and speaking. The diagnosis of RAS is primarily based on clinical history and an oral examination. For research purposes, diagnosis can be supported by the RASDX questionnaire developed by Baccaglini *et al.* (2013), which aims to identify RAS patients. This tool allows for the inclusion of patients in the RAS category even when the clinical presentation is atypical but the questionnaire criteria are met.

In this study, the results of stress level measurements indicated that 22.6% of students experienced severe stress. This proportion is notably higher than that reported by Kusumastuti *et al.*, who found a severe stress prevalence of 4.6%. The elevated stress levels observed may be attributed to the demanding and mentally challenging learning environment. The current curriculum requires dental students to develop a broad range of competencies, including mastery of theoretical knowledge, clinical skills, and interpersonal abilities. Numerous studies conducted in dental schools worldwide have reported significant increases in stress among dental students. For instance, Alzahem *et al.* identified major sources of stress for dental students as related to examinations, clinical demands, supervisory pressures, and responsibility for patient safety. Additionally, professional students are required to fulfill the graduation requirements for each clinical department or rotation, further contributing to their stress levels.

The results of this study also revealed that 93.1% of respondents who tested positive for Recurrent Aphthous

Stomatitis (RAS) experienced severe stress. A significant association between stress and the occurrence of RAS was found among clinical clerkship students at the Faculty of Dentistry, Universitas Sumatera Utara (USU), as demonstrated by the Chi-Square analysis ($P=0.0001$, $p<0.05$). These findings are consistent with the study by Wowor *et al.*, which also reported a significant relationship between stress and RAS ($p<0.05$). Similarly, research by Hamdani found a significant association between stress and RAS incidence among clinical clerkship students at the Faculty of Dentistry, Lambung Mangkurat University ($p<0.05$). This is further supported by Hasanah *et al.*, who reported a significant relationship between stress and RAS among clinical clerkship students at the Faculty of Dentistry ($p<0.05$).

Stressful conditions activate the hypothalamic-pituitary-adrenal (HPA) axis, leading to the release of corticotropin-releasing hormone (CRH). CRH stimulates the pituitary gland to secrete adrenocorticotrophic hormone (ACTH), which then travels through the bloodstream to the adrenal glands. This triggers the secretion of stress hormones, including glucocorticoids (primarily cortisol in humans) and catecholamines (adrenaline and noradrenaline). Elevated adrenaline levels cause vasoconstriction, reducing blood flow and increasing inflammation. Vasoconstriction limits the supply of oxygen and nutrients to tissues, resulting in damage to the oral mucosa and making it more susceptible to microlesions, which can develop into recurrent aphthous stomatitis (RAS). Glucocorticoids such as cortisol suppress immune functions, including those of immunoglobulins IgA and IgG, as well as neutrophils. Reduced IgA levels facilitate the adhesion of pathogenic microorganisms to the mucosa, allowing easier tissue invasion. Decreased IgG impairs phagocytosis, while reduced neutrophil activity diminishes microbial killing. Together, these immune suppressive effects enable the rapid proliferation of microorganisms responsible for the development of RAS^[17].

Conclusion

There is a relationship between stress and the incidence of RAS.

Acknowledgments

The acknowledgments of the funding body, institutional head, co-workers, field assistants, local people etc. should be briefed and declaration of any conflict of interest related to the work.

Conflict of Interest

Not available

Financial Support

Not available

References

1. Wahyudi R, RASi BE, Nazriati E. Overview of the level of stress in students of the Faculty of Medicine, University of Riau, first year, 2015.
2. Ali M, Asim H, Edhi AI. Does academic assessment system type affect levels of academic stress in medical students: A cross-sectional study from Pakistan. *Med Educ Online*. 2015;20(1).
3. Agency for Health Research and Development. Main results of RISKESDAS 2013. Jakarta: Ministry of Health.
4. Babar MG, *et al.* Perceived sources of stress among Malaysian dental students. *Int J Med Educ*. 2015;6:56-61.
5. Koochaki GM, Charkazi A, Hasanzadeh A. Prevalence of stress among Iranian medical students: A questionnaire survey. 2011;17(7).
6. Kurniasih I, Liza I. The effectiveness of cognitive-behavioral stress management in lowering stress levels of first-year undergraduate students of PSPDGUMY. *Insisiva Dental Journal*. 2018;7(2).
7. Bansal N, Bansal R. Stress related oral diseases. *Int. J Curr Res*. 2017;9(5).
8. Fathy E, Abdalla IN, Al Shayeb M. Stress-related oral manifestations/disorders in a population sample of patients attending Ajman University dental clinics. *J Int. Dental Med Res*. 2020;3(2):1-10.
9. C. Scully, R. A. Cawson. *Diseases of the Mouth*, Jakarta: Hipokrates, 1991.
10. Kusumastuti E, Dwi Indah Pertami S, Saadah N, *et al.* The influence of stress on the occurrence of recurrent aphthous stomatitis in dental professional students of IIK Bhakta. *J Oral Health Care*. 2023;10(2):89-98.
11. Arma U, Hasendra SP, Afriza D. The relationship between stress and quality of life on the incidence of stomatitis among RAS sekuren students. *Jurnal Kedokteran Gigi Universitas Padjadjaran*. 2023;35(1):15.
12. Bansal N, Bansal R. Stress related oral diseases. *Int J Curr Res*. 2017;9(5).
13. Fathy E, Abdalla IN, Al Shayeb M. Stress-related oral manifestations/disorders in a population sample of patients attending Ajman University dental clinics. *J Int Dental Med Res*. 2020;3(2):1-10.
14. Cohen S. *Perceived Stress Scale*, 1994.
15. C. Scully, R. A. Cawson. *Diseases of the Mouth*, Jakarta: Hipokrates, 1991.
16. Sewow CC, Pangemanan D, Mintjelungan C. Overview of recurrent aphthous stomatitis at the dental and oral hospital of the dental education study program in 2015. *Jurnal Ilmiah Farmasi-UNSRAT*. 2018;5(2).
17. Kusumastuti E, Pertami DIS, Saadah N, *et al.* The influence of stress on the occurrence of recurrent aphthous stomatitis in dental professional students of IIK Bhakta. *J Oral Health Care*. 2023;10(2):89-98.

How to Cite This Article

Natassa SE, Azzahra AF, Farhan A, Sukma R, Angelia R. The relationship between stress and the incidence of recurrent Aphthous stomatitis in clinical clerkship student. *International Journal of Applied Dental Sciences*. 2025;11(2):325-328.

Creative Commons (CC) License

This is an open-access journal, and articles are distributed under the terms of the Creative Commons Attribution-Non Commercial-Share Alike 4.0 International (CC BY-NC-SA 4.0) License, which allows others to remix, tweak, and build upon the work non-commercially, as long as appropriate credit is given and the new creations are licensed under the identical terms.