Azkya Patria Nawawi, Relationship Between Stress and Temporomandibular Joint Disorders in Medical and Dentistry Student of Universitas Jenderal Achmad Yani Indonesia: Journal of Health and Dental Sciences.E-Issn 2807-3126 Vol. 04 No. 03: pp. 301-312

# RELATIONSHIP BETWEEN STRESS AND TEMPOROMANDIBULAR JOINT DISORDERS IN MEDICAL AND DENTISTRY STUDENT OF UNIVERSITAS JENDERAL ACHMAD YANI INDONESIA

## *(HUBUNGAN ANTARA STRES DENGAN GANGGUAN SENDI TEMPOROMANDIBULA PADA MAHASISWA KEDOKTERAN DAN KEDOKTERAN GIGI UNIVERSITAS JENDERAL ACHMAD YANI INDONESIA)*

Azkya Patria Nawawi[1*], Isti Arifianti[1], Kayla Berniqca Amanda[2]

[1]Department of Prosthodontic, Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi, Indonesia
[2]Faculty of Dentistry, Universitas Jenderal Achmad Yani , Cimahi, Indonesia

*Corresponding author
azkya.patria@lecture.unjani.ac.id

*JHDS.unjani.ac.id/jite*
*Doi: 10.54052/jhds.v4n3.p301-312*

**Article History**
*Received:09/12/2024*
*Accepted:12/12/2024*

## ABSTRACT

The temporomandibular joint disorder is a condition that is often unrecognized by patients. One of the etiologies of temporomandibular joint disorder is stress. Medical and dental students may experience stress associated with symptoms of temporomandibular joint disorders. This study aimed to determine the relationship between stress and temporomandibular joint disorders in dental and medical faculty students. The research design is analytic with a cross-sectional method on 196 students of Medicine and Dentistry at The University Jenderal Achmad Yani, class of 2020. Chi-square analysis investigated the

relationship between temporomandibular joint disorders and stress. The results indicate a significant association between symptoms of temporomandibular joint disorders and stress (p = 0.002). Stress is one of the etiological factors that contribute to the occurrence of temporomandibular joint disorders.

**Keywords**: medical and dentistry students*;* stress; temporomandibular joint disorders

***ABSTRAK***

*Gangguan sendi temporomandibula merupakan kelainan yang jarang disadari oleh penderitanya. Salah satu etiologi gangguan sendi temporomandibula adalah stres. Mahasiswa kedokteran dan kedokteran gigi dapat merasakan stres yang berhubungan dengan gejala gangguan sendi temporomandibula. Tujuan penelitian ini adalah untuk mengetahui hubungan antara stress dan ganguan sendi temporomandibular pada mahasiswa kedokteran gan kedokteran gigi. Rancangan penelitian adalah analitik dengan desain penelitian cross sectional pada 196 Mahasiswa Kedokteran dan Kedokteran Gigi Universitas Jenderal Achmad Yani angkatan 2020. Uji chi square digunakan adalah untuk mengetahui hubungan gangguan sendi temporomandibula dengan stress. Hasil penelitian menyatakan terdapat hubungan yang signifikan antara gejala gangguan sendi temporomandibula dengan stres (p=0,002). Mayoritas responden mengalami stres kategori normal dan mengalami gangguan sendi temporomandibula. Stres merupakan salah satu faktor etiologi terjadinya gangguan sendi temporomandibula sehingga stres mempengaruhi gangguan sendi temporomandibular.*

***Kata kunci****:* gangguan sendi temporomandibular; mahasiswa kedokteran dan kedokteran gigi; stres

## INTRODUCTION

The temporomandibular joint disorder is a disorder that sufferers are rarely aware of, even though more than half of the world's population, roughly 60-70%, experience at least one of the symptoms of temporomandibular joint problems, and only a minority of these people seek treatment for temporomandibular joint disorders. In a study by Goncalves et al. in Brazil in 2010, the prevalence of temporomandibular joint disease was 39.2 %. In 2015, a study by the University of Northern Saudi Arabia found that 49.7% of students had temporomandibular joint abnormalities.[1–3]

Temporomandibular joint disorders involve a combination of joint and muscle abnormalities in the craniofacial region. Clicking in the joint, crepitus, and poor mandibular function are symptoms of temporomandibular joint problems. Genetic factors, age, sex, trauma, parafunctional behaviors, orthodontic treatment, psychosocial variables, and stress are all common causes of temporomandibular joint issues.[4,5] Humans are exposed to stress regularly; stress is the body's reaction to external and internal stressful stimuli. Academic stress is a term used to describe stress that arises in a learning environment.

According to research conducted by the Mental Health Foundation in 2018, 74% of adults in the United Kingdom are stressed. According to research published by the American Psychological Association (APA), stress affects 59 people between the ages of 18 and 38, and 50% of people in the United States feel stressed. According to Riskesdas data from 2013, the prevalence of anxiety and mental and emotional problems among people aged 25 and above was 10-15%, with those aged 15 and up accounting for 6% of Indonesia's total population of 14 million people.[6-9]

According to Lei et al. (2015), adolescents in the Asian continent, particularly in China, Korea, and Singapore, have the highest frequency of academic stress. Various factors, including parental demands, societal pressures, and educational standards, cause academic stress. These factors can contribute to reduced rest time and psychological stress, increasing the risk of temporomandibular joint diseases.[10] The advent of the COVID-19 viral Pandemic in Indonesia prompted the government to take several measures to restrict the virus's spread. One of these measures is implementing social distancing, which requires students to learn via the internet. The online learning technique has

several drawbacks, including some regions with a limited internet connection, limited internet packages, and an increase in the number of tasks that must be completed, all of which can lead to emotional stress.[6,7,11,12]

Medical students in their first year undergo a shift from high school study habits to lecture learning approaches. Lectures are given online during a Pandemic, and this online lecture technique makes students feel pressured.[13,14] From the first year of college, Jenderal Achmad Yani University Medical Students Batch 2020 is the first batch to give lectures online. Consequently, medical and dental students in the 2020 class may experience stress, which may be linked to temporomandibular joint dysfunction symptoms. The author is interested in examining the association between stress and symptoms of temporomandibular joint diseases in 2020 students of the Faculty of Dentistry based on the background that has been written.

## METHOD

The Health Research Ethics Commission of Jenderal Achmad Yani University's Faculty of Medicine approved the study. An analytical approach is employed in this study. From August to October 2021, the research was conducted at the University of Jenderal Achmad Yani's Faculty of Medicine and Dentistry. A simple random sample of 196 respondents was used to select research subjects. A subjective evaluation using a questionnaire was used to assess temporomandibular joint problems. The American Academy of Orofacial Pain claims that (AAOP). A subjective examination using the Depression Anxiety Stress Scale 21 (DASS 21) was used to determine stress levels. Subsequently, the score of each respondent was determined based on the results. The stress levels were divided into three categories based on the overall score calculation: normal, light, medium, and heavy. The correlation coefficient was used to examine the data processing, and the outcomes of this investigation were processed using SPSS.

## RESULT

**Table 1.** The table below summarizes the stress levels of students from the Faculty of Medicine and Dentistry who completed the questionnaire.

| Stress Levels | Category | | | | | |
|---|---|---|---|---|---|---|
| | Medical Faculty | Percentage (%) | Dentistry | Percentage (%) | Totality | percentage (%) |
| Normal | 51 | 41.46 | 30 | 41,1 | 81 | 41.3 |
| Light | 12 | 9.75 | 20 | 27,4 | 32 | 16.3 |
| Medium | 33 | 26.82 | 11 | 15,01 | 44 | 22.4 |
| Heavy | 22 | 17.88 | 7 | 9,59 | 30 | 15.3 |
| Very Heavy | 5 | 4.06 | 4 | 5,48 | 9 | 4.6 |
| Total | 123 | 100.0 | 73 | 100.0 | 196 | 100.0 |

**Table 2.** The table below describes the symptoms of temporomandibular joint disorders experienced by students from the Faculty of Medicine and Dentistry who completed the questionnaire.

| Temporomandibular Joint Disorder Overview | Category | | | | | |
|---|---|---|---|---|---|---|
| | Medical Faculty | Percentage (%) | Dentistry | Percentage (%) | Totality | Percentage (%) |
| Have | 94 | 48 | 63 | 32.1 | 157 | 80.1 |
| Not Have | 29 | 14.7 | 10 | 5.2 | 39 | 19.9 |
| Total | 123 | 100.0 | 73 | 100.0 | 196 | 100.0 |

**Table 3.** Based on these findings, the following table depicts the association between the symptoms of temporomandibular joint diseases and stress.

| Temporomandibular disorder | Stress Level | | | | | | | | | | Total | | P-Value |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Normal | | Light | | Medium | | Heavy | | Very Heavy | | | | |
| | N | % | N | % | N | % | N | % | N | % | | | |
| Have | 54 | 27.6 | 28 | 14.3 | 40 | 20.4 | 26 | 13.3 | 9 | 4.6 | 157 | | |
| Not Have | 27 | 13.8 | 4 | 2.0 | 4 | 2.0 | 4 | 2.0 | 0 | 0.0 | 39 | | 0,002 |
| Total | 81 | 41.3 | 32 | 16.3 | 44 | 22.4 | 30 | 15.3 | 9 | 4.6 | 196 | | |

## DISCUSSION

The stress levels in the General Achmad Yani University Medical and Dentistry Students batch 2020 were mainly normal, as shown in Table 1. Normal stress is a form of stress that many students suffer from at the Faculty of Medicine, Yarsi University Batch 2019. According to D H Subhan's research, as many as 60.3% of the research subjects experienced stress in the normal category. The Depression Anxiety Questionnaire was employed in the study, which took place during the COVID-19 Pandemic with the Stress Scale–21 Items (DASS-21) (DASS-21) questionnaire. Different results were found in Syfyan R's research on nursing students at the University of Muhammadiyah Bengkulu during the COVID-19 Pandemic. The study showed that *stress* was higher; 35.7% of respondents experienced *stress*, while the *stress* was much less, only 9.8%. This study used the DASS questionnaire. This difference in results was produced by a study conducted by Zhafarina et al. The study used a *Student Stress Inventory* (SSI) questionnaire and showed that mild stress was higher for students of the dental faculty at Andalas University.[15,16,17]

Adolescence is a period of life in which emotions are difficult to control. Many people, especially teenagers, endure stress because of their emotional stability. Unstable emotions in a person can create tension. Therefore, many people, especially teenagers, experience stress. Academic stress, which can be caused by tests, academic results, a lack of sleep, or fear of the future, is a source of stress for medical and dentistry students.[11,18,19]

The number of women in this study was 73%, compared to only 27% for men, indicating that there were more women than

men in this study. According to Inama S's research, women experience the most stress compared to males, and the category of stress that women experienced the most in the study was moderate stress. Stress can elicit one of two responses in people exposed to it: a good or negative response. A positive stress reaction is known as eustress, and it can help people become more productive and develop, whereas a negative stress response is known as distress. This stress response can be harmful and have negative consequences for the person experiencing it.[6,11]

Table 2 shows that 80.1% of the study subjects had temporomandibular joint problems, indicating that the number of respondents with temporomandibular joint disorders was higher than that of respondents who did not. Ariyani D and Mira S conducted a study on students from the Faculty of Dentistry, University of North Sumatra, with an age range of 17-22 years, and found that 61% of respondents had temporomandibular joint disorders, indicating that respondents with joint disorders are more likely than those without.[16] The phrase "temporomandibular joint disorder" refers to clinical signs and symptoms involving the temporomandibular joint's mastication, muscles, and related tissues. Because students have a greater risk of developing temporomandibular joint diseases, there is a high prevalence of temporomandibular joint disorders. Psychological variables can interfere with sleep, everyday activities, social activities at work and school, cognitive balance, and physical activity in people who have symptoms of chronic temporomandibular joint diseases.[21,23]

According to statistical research, women are more likely to complain of TMJ discomfort, facial muscle pain, neck and shoulder pain, headaches, masticatory muscle fatigue, and sensitive teeth. Women are more likely than men to have temporomandibular joint problems due to the female hormone estrogen, which plays a significant role in the development of temporomandibular joint diseases. The 3-4:1 ratio of women with temporomandibular joint disorders compared to males with temporomandibular joint disorders implies that gender is a risk factor for temporomandibular joint disorders.[27]

A questionnaire, patient history index, clinical index, and diagnostic criteria can be used to diagnose temporomandibular joint abnormalities. The Academy of Orofacial Pain (AAOP) questionnaire, which comprises ten self-explanatory questions to identify the most prevalent indications and symptoms of orofacial pain and temporomandibular joint abnormalities,

is one of the methods used to diagnose temporomandibular joints. The AAOP questionnaire helps determine whether a child or adolescent has temporomandibular joint issues. The Research Diagnostic Criteria for Temporomandibular Joint Disorder (RDC-TMD), which was revised to become the Diagnostic Criteria for Temporomandibular Disorder (DC/TMD), is one of several steps in determining the operational criteria for the diagnosis of temporomandibular joint disorders, in addition to the AAOP questionnaire. There are two axes in DC/TMD: axes I and II. Axis I is responsible for determining the diagnosis based on signs and symptoms, while Axis II is responsible for deciding psychosocial variables.[24,25,26]

Oliveira said questionnaires were employed to prescreen individuals rather than diagnose them. Identifying the earliest manifestations of temporomandibular joint disorders is crucial because they can be an essential first step in preventive and therapeutic interventions. A clinical examination is required, as well as screening with a questionnaire, to establish a diagnosis of temporomandibular joint disorders,[22,26]

According to Table 3, most of the 196 participants who participated in the study experienced stress in the normal category, ranging from mild to severe stress and temporomandibular joint issues. The normal stress category was the most common stress category experienced by the participants in this study, with 80.1% of respondents experiencing stress in this category and 27.6% experiencing temporomandibular joint disorders, while 13.8% of respondents experiencing normal stress did not experience temporomandibular joint disorders.

It is in line with a study by Zhafarina et al. on dentistry students at Andalas University, which found that more than half of the study participants (61.2 %) had temporomandibular joint abnormalities, with 18 reporting mild stress and 23 experiencing severe stress. Presently. Husada LE et al. found that 63% of respondents had temporomandibular joint abnormalities, with 1.6 % of total respondents falling into the mild stress group, 96.8% falling into the moderate stress category, and 1.6% falling into the severe stress category.[17,15]

Contrary to Triana's research, the study used a questionnaire and clinical examination, which yielded different results. The Kolmogorov-Smirnov statistical test was used to determine the outcomes of this study, and the value of $p = 0.187$ ($p>0.05$) indicated no significant link between the type of stress and TMD

diagnosis. The smaller number of respondents in this survey compared to other studies created a discrepancy in the outcomes.[20] Trauma, mental stress, dental malposition, tooth loss, intrinsic or extrinsic alterations in the TMJ structure, and parafunctional habits are all prominent causes of temporomandibular joint diseases. Stress is one of the variables that cause temporomandibular joint issues because it activates the hypothalamus-pituitary-adrenal (HPA) axis. The HPA axis increases gamma efferent activity through complicated neurological pathways that trigger muscle contraction, increasing muscle tonicity. Pain in masticatory muscles and joints during palpation is a common symptom of inadequate occlusion and stress. Jones et al. discovered that stressed patients with temporomandibular joint issues have higher cortisol levels in their saliva, which could imply an endocrine reaction to stress that causes discomfort. Increased muscle tone increases the likelihood of muscle exhaustion, increasing intra-articular pressure in the temporomandibular joint. Men and women have different levels of HPA and sympathetic nervous system activity, which provide negative feedback when the body is under stress. The HPA and autonomic responses are higher in men, influencing a person's response to stressors.[17,15]

## CONCLUSION

Normal stress levels are most experienced by medical and dental students at Jenderal Achmad Yani University. There was a significant relationship between the symptoms of temporomandibular joint disorders and stress in medical and dental students at Jenderal Achmad Yani.

## CONFLICT OF INTEREST

The authors declare no conflicts of interest.


## ACKNOWLEDGEMENT

We thank the medical staff and the Faculty of Dentistry, Universitas Jenderal Achmad Yani, Cimahi, Indonesia.


## REFERENCES


1. Zwiri AMA, Al-Omiri MK. Prevalence of temporomandibular joint disorders in North Saudi University students. CRANIO 2016; 34(3): 176–81.
2. Umniyati H. Prevalence and severity of Temporomandibular Disorder (TMD) and its severity among YARSI University Employees. J Dentomaxillofac Sci2020; 5(2): 82.
3. Kmeid E, Nacouzi M, Hallit S, Rohayem Z. Prevalence of temporomandibular joint disorder in the

Lebanese population, and its association with depression, anxiety, and stres. Head Face Med 2020; 16(1): 1–11.

4. de Paiva Bertoli FM, *et al*. Prevalence of diagnosed temporomandibular disorders: a cross-sectional study of Brazilian adolescents. PLoS ONE 2018; 13(2): 1–11.
5. Paulino MR, *et al*. Prevalence of signs and symptoms of temporomandibular disorders in college preparatory students: Associations with emotional factors, parafunctional habits, and impact on quality of life. Ciência & Saúde Coletiva 2018 Jan; 23(1): 173–86.
6. Musabiq SA, Karimah I. Description of stress and its impact on students. InSight 2018; 20(2): 74–80.
7. Barseli M, Ifdil I, Fitria L. Stres akademik akibat Covid-19. JPGI 2020; 5(2): 95–9.
8. American Psychological Association [Internet]. Stres in America: The state of our nation. Stres in America Survey [Internet]. 2017; 1–9. Available from: stresin
9. HIMPSI. Seri Sumbangan Pemikiran Psikologi untuk Bangsa Ke-5 Kesehatan Jiwa dan Resolusi Pascapandemi di Indonesia. Himpsi.orId [Internet]. 2020; (September 2019): 13.
10. Lei J, Fu J, Yap AUJ, Fu KY. Temporomandibular disorder symptoms in Asian adolescents and their association with sleep quality and psychological distress. CRANIO 2016; 34(4): 242– 9.
11. Inama S. Gambaran tingkat stres mahasiswa Fakultas Kedokteran Universitas Sumatera Utara dalam sistem pembelajaran daring pada era pandemi Covid-19. Medan: Fakultas Kedokteran. Universitas Sumatera Utara. 2021.
12. Handarini OI and Wulandari SS. Pembelajaran daring sebagai upaya study from home (SFH). JPAP 2020; 8(3): 465–503.
13. Rahmayani RD, Liza RG, Syah NA. Gambaran tingkat stres berdasarkan stresor pada Mahasiswa Kedokteran tahun pertama Program Studi Profesi Dokter Fakultas Kedokteran Universitas Andalas Angkatan 2017. J.kesehat.Andalas 2019; 8(1): 103.
14. Prabamurti GA. Analisis faktor-faktor pemicu level stres akademik mahasiswa kedokteran Universitas Sebelas Maret Surakarta. Surakarta: Fakultas Kedokteran. Universitas Sebelas Maret. 2019.
15. Husada LE, Susiana S, Theresia E. Hubungan antara stres dengan gangguan sendi temporomandibula pada mahasiswa program profesi kedokteran gigi. 2019; 3(2): 129.

16. Dallmer A, Sembiring MG. Hubungan jenis kelamin, usia dan skema oklusi dengan gangguan sendi temporomandibular pada mahasiswa FKG USU. PANNMED 2018; 12(2): 172–6.
17. Adani Z, Atika A, Pujiastuti A, Rahmi E. Hubungan stres dengan temporomandibular disorder pada Mahasiswa Fakultas Kedokteran Gigi Universitas Andalas. ADJ 2020; 8(1): 15–24.
18. Rahmayani RD, Liza RG, Syah NA. Gambaran tingkat stres berdasarkan stresor pada mahasiswa kedokteran tahun pertama Program Studi Profesi Fakultas Universitas Angkatan J.kesehat.Andalas 8(1): 103.
19. Perintis J, No K, Barat S. Hubungan stres dengan temporomandibular disorder. Fakultas Kedokteran Gigi Universitas Andalas. 2015;(77):20–9.
20. Triana A, Rahmi E, Fransiska A. Hubungan stres dengan temporomandibular disorder pada narapidana di lembaga pemasyarakatan perempuan kelas II B Padang. ADJ 2020; 8(2): 75– 83.
21. Bitiniene D, Zamaliauskiene R, Kubilius R, Leketas M, Gailius T, Smirnovaite K. Quality of life in patients with temporomandibular disorders. A systematic review. STOMATOLOGIJA 2018; 20(1): 3–9.
22. de Santis TO, Motta LJ, *et al*. Accuracy of the main screening tools for temporomandibular disorder in children and adolescents. J Bodyw Mov Ther 2014; 18(1): 87–91.
23. Lestari BS. Perbedaan diagnosis gangguan sendi temporomandibula berdasarkan pemeriksaam research diagnostic criteria dan diagnostic criteria for temporomandibula disorder Axis I.
24. Setyawati E, Subhan DH, Yusnita Y. Perbedaan status kesehatan mental mahasiswa Fakultas Kedokteran Universitas Yarsi Angkatan 2019 pada saat sebelum dengan pada saat pandemi Covid-19. Semin Nas Ris Kedokt 2021; 2(1): 193–204.
25. Padila, Syufyan Rinaldi, Juli Andri, Harsismanto 4 MBA. Stres dengan sistem pembelajaran online pada mahasiswa di era pandemi Covid-19. J Telenursing 2021; 3(2): 591–9 (41).
26. Lövgren A, Parvaneh H, Lobbezoo F, Häggman- Henrikson B, Wänman A, Visscher CM. Diagnostic accuracy of three screening questions (3Q/TMD) in relation to DC/TMD in a specialized orofacial pain clinic. Acta Odontol Scand 2018; 76(6): 380–6.

27. Nawawi AP, Rikmasari R, Kurnikasari E, Oscandar F, Lita YA. Volumetric analysis of normal condyles and those with disc displacement with reduction in the Indonesian population: A CBCT study. Imaging Sci Dent 2022; 52: 1–6.