Sriwijaya Journal of Dentistry

Sriwijaya Journal of Dentistry (SJD)
Volume 1 Issue 1 2020 : 76-83
https://jurnalkedokteranunsri.id/index.php/SJD/index

Relationship Between Work Stress And *Temporomandibular Disorders* Risk In Productive Age (Study On Dental Clinical Students Of Sriwijaya University)

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Abstract

***Introduction*:** It is known that stress is one of the risk factors for *Temporomandibular Disorders* (TMD) occurrence. Dental education programs are universally known to be demanding and can cause stress among dental students particularly dental clinical students. The study of the relationship between stress in dental clinical students and TMD risk has not been done yet. This study aimed to assess the relationship between work stress and TMD risk in productive age (study on dental clinical students of UNSRI Palembang). ***Materials and Methods**:* A cross-sectional study was performed towards 80 dental clinical students of Sriwijaya University (UNSRI) aged 21-28. The subjects were instructed to fill two kinds of questionnaire, the first one was Dental Environment Stress (DES) to examine the level of dental clinical student' stress, the other was TMD Diagnostic Index (TMD-DI) to assess the TMD risk. Correlation hypothesis test analysis was carried out between the work stress level of dental clinic students and the risk of TMD. **Results:** Pearson's correlation test showed a significant correlation between stress in dental clinic students and the risk of TMD. The *Pearson* correlation coefficient (r) was 0,724. **Conclusion:** There was a significant relationship between stress in dental clinical students and the risk of TMD.

Keywords: Dental Clinical Students, Dental Environment Stress (DES), Temporomandibular Disorders Risk, TMD Diagnostic Index (TMD-DI)

Introduction

Stress is a common thing in human life.1 Stress that occurs in workers can cause a decrease in the quality of work in the office.[1,2] Too much work stress will cause various kinds of symptoms that can interfere with work performance. [3]

Symptoms that occur when a person experiences work stress include psychological, behavioral, and physical symptoms.[4] Symptoms of physical stress include health problems and illnesses, including excessive fatigue, stomach, and headaches. It may cause an increased heart rate, blood pressure, and breathing, as well as pains in the muscles of the body.[4,5] Work-related stress can also be a risk factor for temporomandibular disorders.[6]

According to the American Academy of Orofacial Pain, temporomandibular disorders (TMD) are a collection of musculoskeletal and neuromuscular disorders involving the temporomandibular joint (TMJ), masticatory muscles, and related tissues.[7] The most common

symptoms of TMD include pain and limited movement of the jaw, sounds of the jaw when opening and closing the mouth, and facial pain, ear discomfort, and headache.[8]

Various previous studies stated that education in the health sector has a high level of stress. One of them is clinical dentistry education.[9.10] Some of the contributing factors include pressures related to time and schedule, uncooperative patients, financial problems, demands for expertise in using instruments, and long working hours.[11,12]

Uraz et al (2010) examined the physical and psychological health of Turkish dentistry students and stated that dental clinic students had higher stress levels than undergraduate students.[11] The highest prevalence of TMD was in patients with productive age, namely 20-40 years old. Therefore, clinical students of Universitas Sriwijaya (UNSRI) dentistry clinic experience or may be at risk of triggering TMD. This study aimed to analyze the relationship between work stress in dental clinical students of UNSRI and the incidence of TMD in productive age.

Methods

This is an analytic observational study with a cross sectional approach, held in May 2019 at the Special Dental and Oral Hospital (RSKGM) and the Central General Hospital dr. Mohammad Hoesin (RSMH) Palembang. The subjects of this study were dental clinical students of UNSRI who met the following inclusion criteria: male or female aged 20-30 years[13], has status as an active dental clinical student at UNSRI, with good general health. The exclusion criteria are as follows: had a history of orthodontic treatment, had a history of the head, face, or neck trauma, and not willing to be the subject of research. The sampling technique used in this study was consecutive sampling that allows every subject meeting the criteria of inclusion is selected until the required sample size is achieved.

We recorded and selected subjects according to the inclusion criteria at RSKGM & RSMH Palembang. Subjects who met the inclusion criteria were explained about the aims and procedures and instructed to sign an informed consent form. Then the subjects were instructed to fill out the Temporomandibular Disorder Diagnostic Index (TMD-DI) and Dental Environmental Stress (DES) questionnaires.

TMD-DI contains eight items of symptoms, predisposing factors, and behavioral factors that increase the risk of developing TMD. The respondents have a risk/trigger for TMD if they

meet the TMD-DI cutoff point simultaneously. The TMD-DI cutoff value is a score of 3. TMD-DI index score ≤3 means the subject does not have a risk/trigger for TMD and vice versa.[14]

The DES questionnaire contains thirty eight items about the pressures and problems experienced by clinical students while undergoing professional programs. The options for each question was in scale 0-4, score 0=not applicable, score 1= no stress, score 2= mild stress, score 3= stress, score 4=highly stressed.[15]

The data obtained were the number of TMD risk status scores and the average stress level scores, which were analyzed using univariate and bivariate analysis. Bivariate analysis was performed using the Pearson correlation test to correlate the TMD-DI score with the DES score.

Results

A total of 80 UNSRI dental clinic students have filled out questionnaires with an age range of 21-28 years and have worked in the clinic for 1-5 years (Table 1).

Table 1. General description of the subjects

Characteristics	The number of subjects (n)	Percentage of Number of Subjects (%)
Gender		
Male	28	35
Female	52	65
Age		
21	1	1,3
22	12	15,0
23	6	7,5
24	16	20,0
25	19	23,8
26	13	16,3
27	10	12,5
28	3	3,8
Academic year		
1st year	20	25,0
2nd year	23	28,8
3rd year	23	28,8
4th year	13	16,3
5th year	1	1,3

The results of the TMD-DI questionnaire showed that some UNSRI dental clinical students had a risk of experiencing TMD. Men are more at risk of experiencing TMD than women (Table 2).

Table 2. The distribution of study subjects based on TMD risk.

Gender	TMD Risk Category		Total
	No risk of TMD	Have risk of TMD	
Male	10 (35,7%)	18 (64,3%)	28 (100%)
Female	30 (57,7%)	22 (42,3%)	52 (100%)
Total	40 (50%)	40 (50%)	80 (100%)

The results of the DES questionnaire analysis showed that the level of work-related stress of the respondents was mostly moderate (Table 3). Most of the subjects who had a TMD risk were at moderate stress levels (Table 3).

Tabel 3. The distribution of subjects based on levels of work-related stress and risk of TMD.

The level of work-related stress	Frequency	Have risk of TMD	No risk of TMD
Low	28	0	28
Moderate	51	39	12
High	1	1	0

Furthermore, the Pearson correlation test was conducted to determine the correlation between stress levels of UNSRI dental clinical students and the risk of TMD (Table 4).

Table 7. Pearson correlation test results between stress levels of UNSRI dental clinical students and the risk of TMD.

	Risk of TMD		
	Significance value (p)	Correlation power (r)	Correlation direction (+/-)
The level of work-related stress	0,000	0,724	+

There is a significant correlation between work-related stress of UNSRI dental clinical students with the risk of TMD ($p < 0.05$) with a value of $r = 0.724$. It shows a strong correlation with a positive correlation direction. The greater the level of stress, the greater the risk of TMD.

Discussions

The results of the current study indicate that there is a relationship between work-related stress and TMD triggers. Individual emotional stress is one of the risk factors for TMD.

Physiological stress is known to induce various responses of physiologic systems, including secretion of the stress hormone, cortisol which has been used as an indicator of stress.[16]

There was a significant correlation between the work-related stress level of UNSRI dental clinical students and the risk of TMD in this study. Dentistry is a department known to have a high level of stress, particularly at the clinical level.[15] The work-related stress of dental clinical students that can trigger the risk of TMD in this study is related to pressure during the clinical study period, such as different opinion between the supervisors, less cooperative patients, as well as difficulties in learning manual skills for clinical and laboratory work.

Another personal problem apart from the academic and clinical fields relates to the lack of recreational time (75% risk of TMD) for UNSRI dental clinic students. It is in line with the research of Ahuja et al. involving Indian dental clinical students, who found that there was a significant correlation between work-related stress and the triggers for TMD.[17] Stress can trigger the risk of TMD by influencing the body to increase the activity of the autonomic and sympathetic nerves. It will lead to increased muscle tone and muscle contraction reflex, causing muscle pain (myofascial) which is one of the symptoms of TMD.[18]

Also, other factors such as age and gender can affect the severity of TMD.[19] The TMD-DI showed that some (50%) UNSRI dental clinic students aged 21-28 years had a risk of experiencing TMD. Gauer et al. stated that the highest risk of TMD is in individuals with the age range of 20-40 years that is the range of productive age.[8] In young adults, a person will be in a productive period with high levels of stress exposure.[20] The reproductive hormones that are actively produced at a productive age also play a role in the development of TMD by increasing pain sensitivity in TMJ.[21]

The results of the DES questionnaire showed that most of the respondents (51%) were having a moderate level of work-related stress. The incidence was higher in women than in

men. In general, women are more susceptible to stress and have higher stress levels than men. Mirsaifi et al. stated that women have higher stress levels than men in all DES subcategories.[22] Psychologically, women are more likely to express emotions and worries. The hormone estrogen in women also plays a role in increasing sensitivity to stress.[23] However, the results of this study indicate that the risk of TMD in men is higher than in women, contradicts the previous study.[24] This may be caused by men tend to shut themselves off, suppress negative emotions, and run away from problems. This emotional suppression has a negative impact and can lead to feelings of depression and a tendency to have emotional reactions (acting aggressively, anxiety, anger).[25]

This current study shows a positive correlation between stress levels and TMD risk, where the greater the stress level, the greater the risk of TMD. According to the results of this study, some (50%) subjects with low-stress levels did not experience the risk of TMD. Restrepo et al. also stated a positive correlation between stress levels and the risk of TMD. Increased stress levels can also lead to increased sensitivity to pain and parafunctional activities (clenching and bruxism) that can exacerbate the triggers for TMD.[26]

Stress management in UNSRI dental clinical students is principal and will help them in their professional life in the future. Experts suggest implementing stress management training for dental clinic students by socializing various stress management topics such as time management and choosing realistic achievements.[27] Also, dental clinic students are encouraged to maintain overall health by applying good sleep, diet, and exercise patterns and trying positive activities to relieve stress, such as yoga and meditation.[27]

TMD-DI can be applied to identify triggers for the risk of TMD occurrence quite easily, accurately and simply. TMD-DI is applied to developing countries with large populations, limited professional staff, and limited equipment such as Indonesia.[28]

Conclusion

Based on the results of the current study, it can be concluded that there is a relationship between work stress and triggers of TMD in students of dental clinical at Universitas Sriwijaya who are in productive age.

References

1. Irawanto DW, Noermiyati, Primasari D. The effect of occupational stress on work performance of female employees: study in Indonesia. Asia Pac J Manage. 2015;11(4):336-345.
2. Restila R. Systematic review: occupational stress and related factors among hospital nurses. KESMAS. 2015;9(2):85-94.
3. Pratama SH, Nugroho S. Analisis faktor-faktor pengaruh stres kerja terhadap kinerja karyawan dengan menggunakan model structural equation modelling (studi kasus karyawan PT. Indofood CBP Sukses Makmur TBK. Divisi Noodle cabang Semarang). Journal of Industrial Engineering Online. 2015;4(1):2.
4. Yenita RN. Higiene industri. 1st ed. Yogyakarta: Deepublish; 2017. p.30-32.
5. Mustafa M, Illzam EM, Muniandy RK, Hashmy MI, Sharifa AM, Nang MK. Causes and prevention of occupational stress. IOSR-JDMS. 2015;14(11):98-104.
6. Mottaghi A, Razavi MS, Pozveh EZ, Jahangirmoghaddam M. Assessment of the relationship between stress and temporomandibular joint disorder in female students before university entrance exam (Konkour exam). Dent Res J. 2011;8(1):76-79.
7. Ferreira CLP, Rodrigues da Silva AM, Maria de Felicio C. Signs and symptoms of temporomandibular disorders in women and men. CoDAS. 2016;28(1):17-21.
8. Gauer RL, Semidey MJ. Diagnosis and treatment of temporomandibular disorders.. Am Fam Physician. 2015;91(6):378-388.
9. AlFaris E, Irfan F, Qureshi R, Naeem N, Alshomrani A, Ponnamperuma G,et al. Health professions' students have an alarming prevalence of depressive symptoms: exploration of the associated factors. BMC Med Educ. 2016;16:279.
10. Basudan S, Binansan N, Alhassan A. Depression, anxiety, and stress in dental students. J Med Educ. 2017;8:179-186.
11. Uraz A, Tocak YS, Yozgathgil C, Cetiner S, Bal Begin. Psychological well-being, health, and stress sources in Turkish dental students. J Dent Educ. 2012;77(10):1345-1355.

12. Reddy S. Reddy RL, Ramesh T, Vijayalaxmi N, Swapma LA, Singh R. Burnout among dental faculty and students in a dental college. Indian J Public Health. 2014;5(1):54-68.
13. Warren MP, Fried JL. Temporomandibular disorders and hormones in women. Cells Tissues Organs. 2001;169:187-192.
14. Himawan LS, Kusdhany L, dkk. Diagnostik Index for Temporomandibular Disorder in Indonesia. *Thai Journal of Oral Maxillofacial Surgery*. 2006;20(2):20-2.
15. Al-Saleh S, Al-Madi EM, Al-Angari N, Al-Shehri H A, Shukri MM. Survey of perceived stress-inducing problems among dental students. Saudi Dent J. 2010;22:83-88.
16. Nadendla LK, Meduri V, Paramkusam G, Pachava KR. Evaluation of salivary cortisol and anxiety levels in myofascial pain dysfunction syndrome. *Korean J Pain*. 2014;27(1):30-34. doi:10.3344/kjp.2014.27.1.30
17. Ahuja V, Ranjan V, Passi D, Jaiswal P. Study of stress-induced temporomandibular disorders among dental students: an institutional study. Natl J Maxillofac Surg. 2018;9(12):147-154.
18. Yoon HJ, Lee SH, Hur JY, Kim HS, Seok JH, Kim HG, et al. Relationship between stress levels and treatment in patients with temporomandibular disorders. J Korean Assoc Oral Maxillofac Surg. 2012;38:326-331.
19. Mazzetto MO, Rodrigues CA, Magri LV, Melchior MO, Palva C. Severity of TMD related to age, sex, and electromyographic analysis. 2014;25(1):54-58.
20. Naidu RS, Adams JS, Simeon D, Persad S. Sources of stress and psychological disturbance among dental students in the West Indies. J Dent Educ. 2002;66(9):1021-1030.
21. Berger M, Szalewski L, Bakalczuk M, Bakalczuk G, Bakalczuk S, Szkutnik J. Association between estrogen levels and temporomandibular disorders: a systematic literature review. Prz Menopauzalny. 2015;14(4):260-270
22. Mirsaifi F, Daneshkazemi A, Sadeghian HA, Vosooghi MR. Evaluating stress level caused by studying environment and related factors in dental students of Yazd dental college in 2014. Avicenna J Dent Res. 2015;7(1):1-4.
23. Shansky RM, Hamo C, Hof PR, Lou W, McEwen B, Morrison JH. Estrogen promotes stress sensitivity in a prefrontal cortex-amygdala pathway. Cereb Cortex. 2010;20:2560-2567.

24. Bagis B, Ayaz EA, Turgut S, Durkan R, Ozcan M. Gender difference in prevalence of signs and symptoms of temporomandibular joint disorder: a restrospective study on 243 consecutive patients. Int J Med Sci. 2012;9(7):539-544.
25. Srivastava S, Tamir M, McGonigal KM, John OP, Gross JJ. The social costs of emotional suppression: a prospective study of the transition to college. J Pers Soc Psychol. 2009 Apr;96(4):883-97
26. Restrepo CC, Vasquez LM, Alvarez M, Valencia I. Personality traits and temporomandibular disorders in a group of children with bruxing behavior. J Oral Rehabil. 2008;35:585-593.
27. Alzahem A, Van der Molen H, Alaujan A, De Boer B. Stress management in dental students: a systematic review. Adv Med Educ Pract. 2014;5:167-176.
28. Gumay RA, Tanti I. Koesmaningati H. The relationship between temporomandibular disorders and quality-of-life-related orofacial pain. J Int Dent Med Res. 2017;10:677-682.