Asian Pac. J. Health Sci., 2018; 5(3):109-112 e-ISSN: 2349-0659, p-ISSN: 2350-0964

Document heading doi: 10.21276/apjhs.2018.5.3.15 Original Article

Association of Depression, Anxiety and Stress with Cognitive functions in female dental students

Krishna Kirti Chilukuri[1*], Kumar Sai Sailesh[2], Ravikanth Manyam[3], Swathi Movva[4], Amarnath[5]

[1]Second year BDS student, Vishnu Dental College, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh, India

[2]Assistant Professor & HOD (I/C), Department of Physiology, Vishnu Dental College, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh, India

[3]Professor, Department of Oral Pathology, Vishnu Dental College, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh, India

[4]Lecturer, Department of Physiology, Vishnu Dental College, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh, India

[5]Lecturer, Department of Anatomy, Vishnu Dental College, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh, India

Received: 02-07-2018 / Revised: 20-07-2018 / Accepted: 20-08-2018

ABSTRACT

Background: Professional courses in medical education are highly stressful and students must be aware of the stress and the coping methods in the beginning of the course itself. Excessive, ill managed stress leads to depression and further suicidal tendency. Student suicides have become common news in today's era. It was reported that depression, anxiety and stress has negative impact on cognition. If the student has higher levels of stress, his academic performance decreases. This leads to increase in the stress further. **Objective:** The present study was undertaken to observe the association of depression, anxiety and stress with cognitive functions in female dental students. **Methodology:** A total of 34 female students studying second year BDS were included in the study after obtaining the written informed consent. Depression, anxiety and stress were assessed by using DASS 21 questionnaire. Cognitive functions were assessed by using digit symbol substitution test. Data was analyzed by SPSS 20.0. Pearson correlation coefficient was applied to observe the association between the variables.**Results:** For association of depression and cognition, the value of R is -0.5212. This is a moderate negative correlation. The value of R^2, the coefficient of determination, is 0.2716. For association of anxiety and cognition, the value of R is -0.268. This indicates negative correlation. The value of R^2, the coefficient of determination, is 0.0718. For association between the stress and cognition, the value of R is -0.1718, which indicates a negative correlation. The value of R^2, the coefficient of determination, is 0.0295.**Conclusion:** There was negative correlation between the depression, anxiety and stress and cognitive functions. It is the need of time to increase awareness in students about stress and train them with coping methods to improve their academic performance and to limit student suicides in our country.

Keywords: Depression; Anxiety; Stress; Dental students

Introduction

Depression, anxiety and stress are mental health disorders which is a major public health issue worldwide.

**Correspondence*

Dr. Sai Sailesh Kumar

Assistant Professor & HOD (I/C), Department of Physiology, Vishnu Dental College, Vishnupur, Bhimavaram, West Godavari District, Andhra Pradesh, India

Email id: dr.saisailesh@gmail.com

Stress is a common word in current years in all the age groups [4].

Student population is most affected by the stress. Stress in students is mainly due to academic pressures from teachers and parents. As the students are not trained or taught how to manage daily life stress, they may adopt mal-coping methods which further increases stress and this may continue like a vicious cycle which may end with causing depression in the students. Stress affects cognitive functions directly by decreasing the attention and indirectly by decreasing the sleep quality. A

student under stress cannot able to concentrate the class; he may not be able to understand the concepts and his academic grades will reduce. Further, decrease in the sleep quality has negative impact on cognitive functions and decreases the physical and mental health [1]. Professional courses are stressful and higher levels of stress were reported in dental students when compared with general population [2]. It was reported that high levels of stress is associated with depression where as low levels of stress was associated with anxiety [3]. There is a strong need to evaluate the students of professional courses in a timed manner for mental health disorders to identify those with high stress levels. These students should be taken care of and support them with stress management methods to prevent further advancement of stress. The present study was undertaken to observe the association of depression, anxiety and stress with cognitive functions in female dental students.

Materials and methods

Study design: Cross-sectional study

Study setting: The present study was conducted at Department of Physiology, Vishnu dental College, Bhimavaram, Andhra Pradesh.

Study population: A total of 34 female students studying second year BDS were included in the study after obtaining the written informed consent. Apparently healthy willing participants were included in the study. Participants with any serious diseases, under any kind of therapy or treatment and unwilling participants were excluded from the study.

Assessment of depression, anxiety and stress: Depression, anxiety and stress were assessed by using DASS 21 questionnaire using mobile app version 1.0.6. It is a self-reported questionnaire to assess the severity of range of symptoms of depression, anxiety and stress. Participants were instructed to download the mobile add of DASS 21 and answer it by their own. Scores were collected from them immediately and tabulated [5].

Assessment of cognitive functions: Cognitive functions were assessed by using digit symbol substitution test. This test assesses the sustained attention and response speed. One to hundred numbers were randomly printed on a paper. Instructions were given to the participants to draw a circle over even numbers and a triangle over odd numbers. The time taken to substitute a symbol for all of the 100 digits was recorded and tabulated [6].

Ethical consideration: The present study was approved by institutional ethical committee of Vishnu Dental College, Bhimavaram.

Data analysis: Data was analyzed by SPSS 20.0. Pearson correlation coefficient was applied to observe the association between the variables. Data was presented as Mean and SEM.

Results: Results are presented in table no 1 and figure no 1 to 3. The demographic data of the participants was presented in table no 1.For association of depression and cognition, the value of R is -0.5212. This is a moderate negative correlation. The value of R^2, the coefficient of determination, is 0.2716 (figure no 1). For association of anxiety and cognition, the value of R is -0.268. This indicates negative correlation. The value of R^2, the coefficient of determination, is 0.0718 (figure no 2). For association between the stress and cognition, the value of R is -0.1718, which indicates a negative correlation. The value of R^2, the coefficient of determination, is 0.0295 (figure no 3).

Table 1: Demographic data of the participants

Sno	Parameter	Mean±SEM
1	Age (years)	18.59±0.13
2	Height (cms)	162.03±0.88
3	Weight (kgs)	56.25±1.69

Data was presented as Mean and SEM.

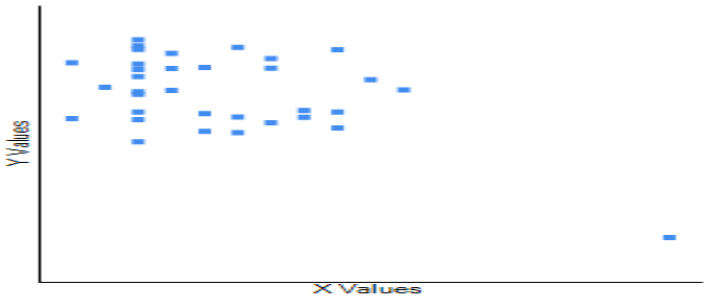

Fig 1: Scatter diagram showing the association of depression and cognition X axis- depression, Y-axis- (digit substitution test)Time in seconds

Fig 2: Scatter diagram showing the association of anxiety and cognition X axis- anxiety, Y-axis- (digit substitution test) Time in seconds

Fig 3: Scatter diagram showing the association of stress and cognition X axis- anxiety, Y-axis- (digit substitution test)Time in seconds

Discussion

The present study aimed to observe the association of depression, anxiety and stress with cognitive functions. There was negative correlation between the depression, anxiety and stress and cognitive functions. This indicates, higher is the depression, anxiety and stress there will be decrease in the cognitive functions. This leads to decrease in the physical and mental health of the individual and there will be decrease in the overall quality of life. Dental education itself has inherent stress as it is involved with highly technical and intensive work. Common factors associated with stress are hectic schedules, managing patients and classes and studies, examination stress [7-10]. Unmanaged, chronic stress leads to depression which leads to impairment in cognition and dementia [11]. During stress, there will be increase in the secretion of hormones which has negative impact on the structures of brain related to memory. These structures include hippocampus the area where consolidation takes place, amygdala and prefrontal lobe [12]. These hormones include epinephrine which acts immediately and cortisol which acts slowly and cause maximum damage [13]. Anxiety

effects cognition by altering the sensory processing in the visual and auditory systems [14-16]. Interestingly the negative signals processed faster when the individual is anxious [17, 18]. It was evident that there was decline in cognitive functions in patients with major depressive disorder [19,20]. The present study results are in accordance with earlier studies as negative correlation was observed between the depression, anxiety and stress and the cognition.

Conclusion

There was negative correlation between the depression, anxiety and stress and cognitive functions. It is the need of time to increase awareness in students about stress and train them with coping methods to improve their academic performance and to limit student suicides in our country.

Acknowledgement

We sincerely thank Dr M. C. Suresh Sajjan, Principal and Dr. Venkata Rama Raju. A, Vice Principal, Vishnu Dental College, for their extensive support and cooperation throughout the study. Our special thanks to the management of Vishnu Dental College for providing necessary facilities for the study.

References

1. Theresa E. Gildner, Melissa A. Liebert, Paul Kowal, SomnathChatterji and J. Josh Snodgrass. Associations between Sleep Duration, Sleep Quality, and Cognitive Test Performance among Older Adults from Six Middle Income Countries: Results from the Study on Global Ageing and Adult Health (SAGE). J Clin Sleep Med. 2014; 10(6): 613–621.
2. Cooper CL, Watts J, Kelly M. Job satisfaction, mental health, and job stressors among general dental practitioners in the UK. Br Dent J. 1987; 162:77–81.
3. Bergdahl J, Bergdahl M. Perceived stress in adults: prevalence and association of depression, anxiety and medication in a Swedish population. Stress and Health. 2002; 18:235–241.
4. World Health Organization. Mental Health: Depression. Available from: http://www.int/ mental health/management /depression/definition /inindex.html. [Last retrieved on 2018 Aug 28].
5. Lovibond SH, Lovibond PF. Manual for the Depression Anxiety Stress Scales. 2nd Ed Psychology Foundation Sydney 1995.
6. Lezak MD. Neuropsychological Assessment. 5th. New York: Oxford University Press; 2012.
7. Westerman GH, Grandy TG, Ocanto RA, Eriksine CG.Perceived sources of stress in the dental school environment. J Dent Educ 1993; 57:225-31.
8. Heath JR, MacFarlane TV, Umar MS. Perceived sourcesof stress in dental students. Dent Update 1999; 26:94-100.
9. Lamis DR. Perceived sources of stress among dental students at the University ofJordan. J Dent Educ. 2001; 65:232-41.
10. Shashidhar Acharya. Factors Affecting Stress among Indian Dental Students. Journal of Dental Education. 2003; 67(10):1140-1148.
11. Sandi C. Stress and cognition. Wiley Interdiscip Rev Cogn Sci. 2013;4(3):245-261.
12. Chattarji S., Tomar A., Suvrathan A., Ghosh S., Rahman M. M. Neighborhood matters: divergent patterns of stress-induced plasticity across the brain. Nat. Neurosci. 2015;18: 1364–1375.
13. Bruce SMcEwen, Robert MSapolsky. Stress and cognitive function. 1995; 5(2): 205-216.
14. Cornwell B. R., Baas J. M., Johnson L., Holroyd T., Carver F. W., Lissek S., et al. (2007). Neural responses to auditory stimulus deviance under threat of electric shock revealed by spatially-filtered magneto encephalography. Neuroimage 37, 282–289.
15. Lim S. L., Padmala S., Pessoa L. (2009). Segregating the significant from the mundane on a moment-to-moment basis via direct and indirect amygdala contributions. Proc. Natl. Acad. Sci. U.S.A. 106, 16841–16846
16. Shackman A. J., Maxwell J. S., McMenamin B. W., Greischar L. L., Davidson R. J. Stress potentiates early and attenuates late stages of visual processing. J. Neurosci.2011; 31:1156–1161.
17. Robinson O., Letkiewicz A., Overstreet C., Ernst M., Grillon C. The effect of induced anxiety on cognition: threat of shock enhances aversive processing in healthy individuals. Cogn. Affect. Behav. Neurosci..2011; 11: 217–227.
18. Robinson O. J., Charney D. R., Overstreet C., Vytal K., Grillon C. The adaptive threat bias in anxiety: amygdala-dorsomedial prefrontal cortex coupling and aversive amplification. Neuroimage.2012; 60: 523–529.
19. Raymond W Lam, Sidney H Kennedy, Roger S McIntyre and AtulKhullar. Cognitive Dysfunction in Major Depressive Disorder: Effects on Psychosocial Functioning and Implications for Treatment. Can J Psychiatry. 2014; 59(12): 649–654.
20. ÅsaHammar and Guro Årdal. Cognitive Functioning in Major Depression – A Summary. Front Hum Neurosci. 2009; 3: 26.

Conflict of Interest: None
Source of Support: Nil