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A longitudinal study on stress sources perceived by Chilean dental students

Estudio longitudinal de las fuentes de estrés percibidas por estudiantes de odontología chilenos

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| Abstract |

Introduction: Establishing the perception of academic stress by university students is highly relevant to obtain valuable feedback on the efficiency and acceptability of educational methods.

Objective: To evaluate the differences in stress factors perceived by first-year dental students during the first and second semesters according to gender.

Materials and methods: Exploratory, non-experimental, longitudinal descriptive study. The Spanish version of the Dental Environment Stressors (DES) questionnaire was applied, adapted and validated for the dental students of the San Sebastián University (Concepción, Chile) in May and October 2016. The sample consisted of 83 first-year students evaluated. A general comparison of the variables under study (stress and its dimensions) was made for both periods, considering genders and using the Student's t-test. Fisher's F test was used after estimating whether or not there was equality of variances between the groups.

Results: The second measurement revealed that the "clinical training" dimension in women was the only component that showed significant differences with values above the mean.

Conclusion: The perception of stress was estimated for all items of the DES questionnaire, obtaining a higher score in the "clinical training" dimension in women.

Keywords: Longitudinal Studies; Chile; Students, Dental; Stress, Psychological (MeSH).

| Resumen |

Introducción. La percepción de los estudiantes universitarios sobre el estrés académico es fundamental, ya que proporciona información valiosa sobre la eficiencia y aceptabilidad de los métodos educativos.

Objetivo. Evaluar las diferencias en los factores de estrés percibidos por los estudiantes de primer año de odontología durante el primer y segundo semestre según género.

Materiales y métodos. Estudio descriptivo exploratorio, longitudinal y no experimental. En mayo y octubre de 2016 se aplicó la versión en español del Dental Environment Stressors (DES), adaptado y validado para estudiantes de odontología en la Universidad San Sebastián (Concepción, Chile). La muestra consistió en 83 estudiantes de primer año. La comparación de las variables en estudio (estrés y sus dimensiones) entre los dos períodos comparados, en general y considerando los géneros, se realizaron mediante la prueba t-Student, previa estimación de existencia o no de igualdad de varianzas entre los grupos mediante la prueba F de Fisher.

Resultados. En la segunda medición, la dimensión "Formación clínica" en mujeres fue el único componente que mostró diferencias significativas con valores superiores de la media.

Conclusión. Existe una percepción de estrés para todos los ítems del cuestionario DES; las mujeres tuvieron una mayor puntuación en la dimensión "Formación clínica".

Palabras clave: Estudios longitudinales; Chile; Estudiantes de odontología; Estrés psicológico (DeCS).

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Introduction

The literature defines stress as the relationship between an individual and the environment; therefore, it is a psychosocial factor, in which some of its characteristics are perceived as a threat to physical or mental health. (1-2) Stress can lead to permanent tiredness, headaches, digestion problems, drowsiness, and sleep and mental health disorders. (3-5)

Compared to students from other health programs, dental students seem to be affected by stress in a higher proportion. (6-9) Around 90% of the students have reported high stress rates when they feel overworked in short periods of time. In consequence, an intervention in this regard would help reducing such rates. (10-11)

Most universities do not have instruments to perform an initial evaluation of their students, so many personal characteristics and psychosocial factors that could be determinant in the development of pathologies associated with stress are still unknown. Additionally, stressors related to academic stress have only been evaluated at certain moments, and their evolution has been rarely studied during the course of the academic year. (12-13)

The perception of university students regarding academic stress is highly relevant to obtain valuable feedback on the efficiency and acceptability of educational methods. The stressful nature of Dentistry can be experienced since the beginning of training, when students are expected to acquire a wide range of knowledge and skills that will help them succeed in their studies and their profession. (1,5)

Different works show a higher prevalence of stress and emotional disturbances in medical and dental students in whom psychological disorders, including depression, anxiety and stress, are more frequently documented worldwide compared to other health careers. (3,6,8,14-17) In addition, the psychological health condition of these students becomes evident in terms of low academic achievement levels and satisfaction with life. (18,19) In this scenario, stress represents a major challenge, especially during the first year of studies, considering the lack of a learning strategy, sleepless nights and inadequate eating during exams. (20)

There is evidence of different stressors perceived by first-year dental students, understanding perception as an idea or knowledge of something through the senses. (8,21) However, to date, research on perceived stress among groups of Spanish-speaking students is scarce and only a handful of studies evaluate the perception of stress in first-year students during the first and second semesters. Therefore, the role that stress may have on students at the beginning of their professional studies has not been considered. (13)

Many of the studies that provide information regarding the correlation between stressors and academic year do not present clear data in relation to gender. (22-25) While most of them report higher stress rates in female dental students (22,25), one study reported higher levels in men (26) and one reported no overall differences between genders. (27)

For this reason, the objective of this research is to evaluate the differences in stress factors perceived by first-year dental students during the first and second semesters according to gender, in order to promote the adoption of preventive measures and minimize the negative effects of stress on these students.

Materials and methods

This was an exploratory, non-experimental, longitudinal descriptive study. The cohort was made up of all first-year undergraduate dental students from the San Sebastián University (SSU) in Concepción-Chile, officially enrolled in 2016. Participation in the study was voluntary, the confidentiality of the students was maintained and the ethical principles of the Helsinki Declaration were followed.

The sample was selected for convenience based on the following exclusion criteria: students absent on the day of application of the questionnaire, and those who did not wish to participate in the study or did not sign the informed consent. The Dental Environment Stressors (DES) DES30-Sp survey was applied twice during the academic year —the first week of May and October 2016—, corresponding to the third month of the first and second semesters, using a pencil. The month of May was selected since, at this point, the students have already experienced at least two months of immersion in a university educational environment and have acquired an idea or knowledge about the future of their university career, and October because it coincides with other studies that have applied the DES questionnaire. (13)

Factors such as class size, leisure time, assessment procedures, peer and teacher relationships, ethical climate, extracurricular opportunities, beliefs, attitudes and sociocultural background influence significantly the way how students perceive and experience their education. (12,22,28) However, the Garbee's Dental Environment Stressors questionnaire —modified by Westerman (26) and Polychronopoulou (29)— has been widely used in research studies. (3,8,12,30-31) Polychronopoulou & Divaris (29) reviewed the instrument, presenting a 30-item version that was later used in multinational and longitudinal studies among dental students. (23,31)

The DES30-Sp in Spanish is an instrument validated by Fonseca *et al.* (13) in Chile. It includes 30 items regarding stressful dental educational environments that students must classify based on a scale considering their potential as stress generators. In this way, a score of 1 is assigned to a factor that is not stressful at all; 2, for somewhat stressful; 3, for quite stressful, and 4, for very stressful. This instrument includes stressors such as "qualifications and exams", "lack of time for relaxation", "patients arrived late or did not make an appointment", "lack of confidence to be a successful student" and "difficulty of the work assigned in classes", among others. Its psychometric properties are good (Cronbach's alpha =0.89), it is easy to use and its application time is approximately 15 to 20 minutes. (13) Gender (male /female) and the academic semester when the survey was applied (first/second) were the independent variables, while the total score was the dependent variable. Scores of 2 and higher suggest the presence of high stress levels.

The Kolmogorov-Smirnov test (K-S test) was used for the statistical analysis of the data on the averages of stress levels during the different collection dates and on gender. (32) The internal reliability of the data was estimated using the general Cronbach's alpha and the resulting values as each of the elements (questions); intraclass correlation coefficient, Hotelling's T2, and Tukey's non-additive test were eliminated.

Subsequently, mean, standard deviation and standard error of the mean for both periods and genders were estimated for general stress and for each of its dimensions. The comparison of the variables under study (stress and its dimensions) for both periods, in general and considering genders, was performed using the student's t-test, after estimating whether or not there was equality in the variances between both groups using the Fisher's exact test (F-test). If the F-test was significant, the student's t-test was used (t prime); if it was not significant, the student's t- test was used in agreement with Díaz-Narváez. (33,34) The level of significance was $\alpha \leq 0.05$.

Results

The sample consisted of 83 students. Cronbach's alpha was satisfactory (untyped and typified =0.932), thus leading to infer that

the data had internal reliability. The total Cronbach's alpha value, if an element (question) was removed, ranged between 0.928 and 0.933, which demonstrated the reliability of the test regardless of the presence of any of the elements. The intraclass correlation coefficient was 0.932 (F=14.7, p=0.001), which confirms the good reliability of the data. Hotelling's T2 test (F=19.7, p=0.001) and Tukey's non-additive (F=6.17, p=0.01) allow, in the first case, to infer that the means of the questions are different from each other, which shows that not all contribute equally to the global mean ($\bar{X}$=2.56), and also the variability between the responses of the instrument. In the second case, it is possible to infer that there is an additive character in the data, which suggests the need of a bigger sample for future research.

Table 1 presents the results of the comparison between stress perception and its dimensions in both periods examined. Perception of stress in general was not significant; however, when examining the "Clinical Training" dimension, it was highly significant. The negative sign of the statistical test indicates that the values of this dimension are greater in the second measurement than in the first.

Table 2 presents the same comparison but considering the female gender exclusively. The results show that the only significant comparison was "Clinical Training". The negative sign of the statistical test shows that the values of this dimension are greater in the second measurement in relation to the first; these results consider exclusively the male gender and do not show any significant differences in perception of stress in general and in each of its dimensions (table 3).

Table 1. Results of the comparison of stress perception and its dimensions in both periods in dental students from the San Sebastián University in Concepción (Chile), 2016.

	Data collection	n	$\bar{X}$	σ
General Stress t=-1.06; p=0.288 ns	May	83	2.5157	0.49563
	October	80	2.6075	0.60183
Self-Efficacy Beliefs t=-1.31; p=0.19 ns	May	83	2.5873	0.68458
	October	80	2.7438	0.83626
Faculty and Administration t=-0.84; p=0.401 ns	May	83	2.2691	0.58193
	October	80	2.3521	0.67349
Academic Workload t= 0.19; p=0.85 ns	May	83	2.7912	0.53587
	October	80	2.7729	0.68449
Patient Treatment t=-0.933; p=0.352 ns	May	83	2.6586	0.78083
	October	80	2.7708	0.75304
Clinical Training t=-2.68; p=0.008 *	May	83	2.2410	0.63130
	October	80	2.5625	0.88366
Academic Performance t=-1.61; p=0.11 ns	May	83	2.6867	0.64728
	October	80	2.8563	0.69898
Others t=-0.561; p=0.58 ns	May	83	2.4182	0.67957
	October	80	2.4786	0.69396

$\bar{X}$: arithmetic mean of stress in general and of each component at different periods; σ: standard deviation; ns: not significant.
* highly significant.
Source: Own elaboration based on the data obtained in the study.

Table 2. Results of the comparison of stress perception and its dimensions in both periods in female dental students from San Sebastián University in Concepción (Chile), 2016.

	Data collection	n	$\bar{X}$	σ
General Stress t=-0.41; p=0.679 ns	May	53	2.6034	0.45827
	October	50	2.6460	0.57865
Self-Efficacy Beliefs t=-1.123; p=0.26 ns	May	53	2.6698	0.60402
	October	50	2.8250	0.79097
Faculty and Administration t=-1.123; p=0.26 ns	May	53	2.3589	0.58875
	October	50	2.3800	0.64909
Academic Workload t=1.24; p=0.28 ns	May	53	2.8832	0.48133
	October	50	2.7434	0.65284
Patient Treatment t=-0.32; p=0.75 ns	May	53	2.7732	0.72160
	October	50	2.8198	0.78071
Clinical Training t=-2.47; p=0.015 *	May	53	2.2358	0.61709
	October	50	2.6100	0.89949
Academic Performance t=-0.80; p=0.43; ns	May	53	2.7547	0.66233
	October	50	2.8600	0.67036
Others t=-0.32; p=0.75; ns	May	53	2.5255	0.63457
	October	50	2.5658	0.63854

$\bar{X}$: arithmetic mean of stress in general and of each component at different periods; σ: standard deviation; ns: not significant.
* Significant 5%.
Source: Own elaboration based on the data obtained in the study.

Table 3. Results of the comparison of stress perception and its dimensions in both periods in male dental students from San Sebastián University in Concepción (Chile), 2016.

	Data collection	n	$\bar{X}$	σ
General Stress t=-1.19; p=0.238 ns	May	30	2.3603	0.52908
	October	30	2.5417	0.64415
Self-Efficacy Beliefs t=-0.75; p=0.45 ns	May	30	2.4417	0.79785
	October	30	2.6083	0.90421
Faculty and Administration t=-1.17; p=0.24 ns	May	30	2.1113	0.54427
	October	30	2.3053	0.72053
Academic Workload t=-1.12; p=0.27 ns	May	30	2.6270	0.59460
	October	30	2.8217	0.74290
Patient Treatment t=-1.15; p=0.253 ns	May	30	2.4550	0.85138
	October	30	2.6890	0.71059
Clinical Training t=-1.17; 0.24 ns	May	30	2.2500	0.66631
	October	30	2.4833	0.86586
Academic Performance t=-1.59; p=0.116 ns	May	30	2.5667	0.61214
	October	30	2.8500	0.75601
Others t=-0.55; p=0.58	May	30	2.2280	0.72417
	October	30	2.3340	0.76586

$\bar{X}$: arithmetic mean of stress in general and of each component at different periods; σ: standard deviation; ns: not significant.
Source: Own elaboration based on the data obtained in the study.

Discussion

Stress varies from person to person and occurs when the pressures and demands they face, whether real or imagined, are perceived as excessive. (16)

Despite the lack of cut-off scores, scores of 2 and higher suggest the presence of high stress levels in the general analysis of DES. (8) In consequence, the results of this study show moderate initial stress levels, which coincides with Silverstein & Silverstein in the U.S (24), who also found an initial level of stress in dental students that might be related to moving away from their usual social circle, developing new friendships, immersing themselves in a new environment, presenting own insecurities, financial concerns or academic performance. (35-37)

The results of the DES questionnaire, regarding the different dimensions, could shed some light on what students consider a cause of stress in the Faculty. With this in mind, the predominant stressors found in this research in descending order and considering the absolute mean values are "Academic workload", "Academic performance", "Patient treatment" and "Self-efficacy beliefs". These results differ from Silverstein & Silverstein, since they determined that the financial responsibility, stressor belonging to the item "Others", is the most predominant, followed by "Academic performance" and "Academic Workload". (24) This difference could occur, in part, because in Chile the financial burden falls on the family and not directly on the student.

The changes experienced by the students, who go from high school to the university, becomes relevant because they are subject to a greater academic load, which may lead them to think that they will not be successful and will fail, causing stress and anxiety. (37-38)

The third predominant factor is "Patient treatment", which is surprising because students do not interact with clinical subjects or patients in the first year. This may reflect the effect of the academic environment on second-semester students, who may be transferring their negative impressions to freshmen. On the other hand, a statistically significant difference was observed in the "Others" dimension between the mean of the data of May and October. This dimension includes extracurricular factors related to personal, socio-economic and future employment situation, and could be explained, in part, by the uncertainty generated by events such as changing city, which leads us to think of adaptation to these factors by the new students. (24)

When analyzing the stress level perceived per semester, it is evident that, at the beginning of the second semester, perception increases compared to the first semester. This coincides with other longitudinal studies made in Jordan, Greece and the U.S, which obtained a similar result (3,8,23-24), and with several transversal studies made in Turkey, Chile and Malaysia that indicate high stress levels. (7,13,30) All of this shows that Dentistry is a highly demanding career and can lead to emotional, psychological or physical difficulties for students.

On the other hand, the predominant factors of the second semester, considering the absolute values of the means in decreasing order, are "Academic Performance", "Academic Workload", "Patient treatment" and "Self-efficacy beliefs". This means that a high perception of the same factors of the first semester is maintained, but this time, "Academic Performance" ranks first in terms of absolute values. These results agree with several studies conducted in Chile, Jordan, Malaysia and Nepal (1,3,8,30,39), where the DES instrument was also applied. In this context, the work of Fonseca *et al.* is relevant since it was applied in Chile and Argentina obtaining similar results. (13)

Polychronopoulou & Divaris (23) also point out "Patient treatment" as a stress factor in the first year, which is striking considering that "Clinical training" had a statistically significant result when compared to the first semester. It is important to highlight this result as several studies have modified the DES by eliminating factors related to patients and the clinic to adapt it to students of pre-clinical courses. (3,8,22,24-25)

Moreover, the results show that clinical training is higher in women. This could be explained since women reportedly have greater interpersonal skills as well as a greater perception and understanding of emotions, while men stand out for greater ability to control impulses, tolerance to stress and greater ability to repair their emotional states. (40-41)

This greater tendency of women to attend their emotions, together with the smaller capacity of repair, could explain the higher scores obtained for this dimension. There is evidence that certain areas of the brain dedicated to emotional processing may be larger in women than in men. Another study indicates that brain activity is different according to gender. (40)

Many research studies suggest that differences in intensity of response to perceived stressors could be explained by the various patterns of psychological morbidity and the social construction of masculinity in which men tend not to express their concerns. (1,23,30,42,43) In addition, Sanders & Lushington explain that this could occur due to different patterns of response to stressful events by sex. (44) Research conducted in India by Shashidhar (45) and Kumar *et al.* (46) showed that men presented higher levels of stress than women did. Other studies, conducted in Australia and Europe did not find gender differences. (31,44) This may indicate a cultural difference in gender-related stress response, which may not be associated with the perception of stress but rather with sociocultural influences. (25)

The results obtained here show that students have a certain perception before actually interacting with the patients and the clinic. Therefore, this factor should be considered in future studies of stress in students, even at the pre-clinical stage. It is important to consider these factors to implement stress management measures from the very beginning of the career, and to develop cohort studies to learn about the evolution of these students in the following academic years. This is relevant since evidence shows that dentists are more prone to occupational exhaustion or burnout, anxiety and depression due to the multiple sources of stress in their academic and professional life (25,47,48), which leads to a higher risk of developing problems such as insomnia, headache, cardiovascular and gastrointestinal diseases, back pain, chronic fatigue, among others. (49,50) In conclusion, this research shows that stress related to patient care begins at early stages of the professional career —first year —, so measures must be planned and implemented from the beginning of the career.

The limitations of the study include the fact that only first-year dental students of one academic program participated, thus limiting the size of the sample, and the fact that the study was a follow-up to the course group and not the student.

Conclusion

Stress was perceived in all items of the DES questionnaire, where women had a higher score in the dimension "Clinical training". Further studies should include a larger sample, with individual follow-up. It is worth noting that the clinical field is important for first-year students, therefore, it is necessary to take steps to improve the academic environment during the course of the academic program.

Conflicts of interest

None stated by the authors.

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References

1. **Misrachi-Launert C, Ríos-Erazo M, Manríquez-Urbina JM, Burgos-Ibarra C, Ponce-Espinoza D.** Fuentes de estrés percibidas y rendimiento académico de estudiantes de odontología chilenos. *FEM.* 2015;18(2):109-16. http://doi.org/chsv.
2. **Castellanos-Suárez JL, Díaz-Guzman LM, Lee-Gómez EA.** Medicina en Odontología. Manejo Dental de Pacientes con Enfermedades Sistémicas. 3rd ed. México D.F.: Editorial Manual Moderno; 2015.
3. **Abu-Ghazaleh SB, Sonbol HN, Rajab LD.** A longitudinal study of psychological stress among undergraduate dental students at the University of Jordan. *BMC Med Educ.* 2016;16:90. http://doi.org/f8dkv8.
4. **Alzahem AM, Van der Molen HT, Alaujan AH, De Boer BJ.** Stress management in dental students: a systematic review. *Adv Med Educ Pract.* 2014;5:167-76. http://doi.org/gb9xxp.
5. **Al-Sowygh ZH, Alfadley AA, Al-Saif MI, Al-Wadei SH.** Perceived causes of stress among Saudi dental students. *King Saud Univ J Dent Sci.* 2013;4(1):7-15. http://doi.org/chsw.
6. **Alzahem AM, Van der Molen HT, De Boer BJ.** Effect of year of study on stress levels in male undergraduate dental students. *Adv Med Educ Pract.* 2013;4:217-22. http://doi.org/gb9xv9.
7. **Uraz A, Tocak YS, Yozgatligil C, Cetiner S, Bal B.** Psychological well-being, health, and stress sources in Turkish dental students. *J Dent Educ.* 2013 [cited 2016 Nov 27];77(10):1345-55. Available from: https://goo.gl/RJ9Q1C.
8. **Elani HW, Allison PJ, Kumar RA, Mancini L, Lambrou A, Bedos C.** A systematic review of stress in dental students. *J Dent Educ.* 2014 [cited 2017 Mar 20];78(2):226-42. Available from: https://goo.gl/yMxpRj.
9. **Waghachavare VB, Dhumale GB, Kadam YR, Gore AD.** A Study of Stress among Students of Professional Colleges from an Urban area in India. *Sultan Qaboos Univ Med J.* 2013 [cited 2017 Apr 2];13(3):429-36. Available from: https://goo.gl/9mUQrZ.
10. **Feldman L, Goncalves L, Chacón-Puignau GC, Zaragoza J, Bagés N, De Pablo J.** Relaciones entre estrés académico, apoyo social, salud mental y rendimiento académico en estudiantes universitarios venezolanos. *Univ Psychol.* 2008 [cited 2017 ct 20];7(3):739-52. Available from: https://goo.gl/9Bo1gJ.
11. **García-Ros R, Pérez-González F, Pérez-Blasco J, Natividad LA.** Evaluación del estrés académico en estudiantes de nueva incorporación a la universidad. *Revista Latinoamericana de Psicología.* 2012 [cited 2017 Oct 20];44(2):143-54. Available from: https://goo.gl/fKn7ax.
12. **Divaris K, Polychronopoulou A, Villa-Torres L, Mafla AC, Moya GA, González-Martínez F, *et al.*** Extracurricular factors influence perceived stress in a large cohort of Colombian dental students. *J Dent Educ.* 2014 [cited 2017 Apr 2];78(2):213-25. Available from: https://goo.gl/fnmv1m.
13. **Fonseca J, Divaris K, Villalba S, Pizarro S, Fernandez M, Codjambassis A, *et al.*** Perceived sources of stress amongst Chilean and Argentinean dental students. *Eur J Dent Educ.* 2013;17(1):30-8. http://doi.org/chsx.
14. **Al-Sowygh ZH.** Academic distress, perceived stress and coping strategies among dental students in Saudi Arabia. *Saudi Dent J.* 2013;25(3):97-105. http://doi.org/chsz.
15. **Eva EO, Islam MZ, Mosaddek AS, Rahman MF, Rozario RJ, Iftekhar AF, *et al.*** Prevalence of stress among medical students: a comparative study between public and private medical schools in Bangladesh. *BMC Res Notes.* 2015;8:327. http://doi.org/f7st75.
16. **Montero-Marin J, Piva-Demarzo MM, Pereira JP, Olea M, García-Campayo J.** Reassessment of the Psychometric Characteristics and Factor Structure of the 'Perceived Stress Questionnaire' (PSQ): Analysis in a Sample of Dental Students. *PLoS ONE.* 2014;9(1):e87071. http://doi.org/chs2.
17. **Campos JA, Jordani PC, Zucoloto ML, Bonafé FS, Maroco J.** Burnout syndrome among dental students. *Rev Bras Epidemiol.* 2012;15(1):155-65. http://doi.org/chs3.
18. **Abdallah AR, Gabr HM.** Depression, anxiety and stress among first year medical students in an Egyptian public university. *Int Res J Med Medical Sci.* 2014 [cited 2016 Dec 21];2(1):11-19. Available from: https://goo.gl/4Smzp7.
19. **Aboalshamat K, Hou XY, Strodl E.** Psychological well-being status among medical and dental students in Makkah, Saudi Arabia: A cross-sectional study. *Med Teach.* 2015;37(Suppl 1):75-81. http://doi.org/chs4.
20. **Nechita F, Nechita D, Pîrlog MC, Rogoveanu I.** Stress in medical students. *Rom J Morphol Embryol.* 2014 [cited 2017 Jan 5];55(3):1263-6. Available from: https://goo.gl/V7PbSn.
21. Diccionario de la lengua española. 22nd ed. Madrid: Real Academia Española; *2014.* Percepción.
22. **Sugiura G, Shinada K, Kawaguchi Y.** Psychological well-being and perceptions of stress amongst Japanese dental students. *Eur J Dent Educ.* 2005;9(1):17-25. http://doi.org/dzpqzb.
23. **Polychronopoulou A, Divaris K.** A longitudinal study of Greek dental students' perceived sources of stress. *J Dent Educ.* 2010 [cited 2017 Feb 4];74(5):524-30. Available from: https://goo.gl/pRpwfn.
24. **Silverstein ST, Kritz-Silverstein D.** A Longitudinal Study of Stress in First-Year Dental Students. *J Dent Educ.* 2010 [cited 2017 Jan 22];74(8):836-48. Available from: https://goo.gl/3Et6vF.
25. **Gorter R, Freeman R, Hammen S, Murtomaa H, Blinkhorn A, Humphris G.** Psychological stress and health in undergraduate dental students: fifth-year outcomes compared with first-year baseline results from five European dental schools. *Eur J Dent Educ.* 2008;12(2):61-8. http://doi.org/cczjd8.
26. **Westerman GH, Grandy TG, Ocanto RA, Erskine CG.** Perceived sources of stress in the dental school environment. *J Dent Educ.* 1993 [cited 2016 Nov 25];57(3):225-31. Available from: https://goo.gl/Q7dnCk.
27. **Humphris G, Blinkhorn A, Freeman R, Grter R, Hoad-Reddick G, Murtomaa H, *et al.*** Psychological stress in undergraduate dental students: baseline results from seven European dental schools. *Eur J Dent Educ.* 2002;6(1):22-9. http://doi.org/fgdbcv.
28. **Pai PG, Menezes V, Srikanth A, Subramanian AM, Shenoy JP.** Medical students' perception of their educational environment. *J Clin Diagn Res.* 2014;8(1):103-7. http://doi.org/chs7.
29. **Polychronopoulou A, Divaris K.** Perceived sources of stress among Greek dental students. *J Dent Educ.* 2005 [cited 2016 Nov 23];69(6):687-92. Available from: https://goo.gl/LF6oyy.
30. **Babar MG, Omar H, Lim LP, Khan SA, Mitha S, Ahmad SF, *et al.*** An assessment of dental students' empathy levels in Malaysia. *Int J Med Educ.* 2013;4:223-9. http://doi.org/b8zb.
31. **Polychronopoulou A, Divaris K.** Dental students' perceived sources of stress: a multi-country study. *J Dent Educ.* 2009 [cited 2016 Nov 29];73(5):631-9. Available from: https://goo.gl/ySp2w3.
32. **Díaz-Narváez VP.** Metodología de la Investigación científica y Bioestadística. Para médicos, dontólogos y estudiantes de ciencias de la salud. Santiago de Chile: RiL editores; 2009.
33. **Díaz-Narváez VP.** Errores estadísticos frecuentes al comparar dos poblaciones independientes. *Rev Chil Nutr.* 2009;36(4):1136-8. http://doi.org/bc6vw3.

34. **Díaz-Narváez VP, Calzadilla-Núñez A.** Artículos científicos, tipos de investigación y productividad científica en las Ciencias de la Salud. *Rev Cienc Salud.* 2016;14(1):115-21. http://doi.org/b893.

35. **Pérez-Díaz F, Cartes-Velásquez R.** Estrés y burnout en estudiantes de Odontología: una situación preocupante en la formación profesional. *Rev EDUMECENTRO.* 2015 [cited 2017 Jan 08];7(2):179-90. Available from: https://goo.gl/wqwJaC.

36. **Corsini G, Bustos L, Fuentes J, Cantín M.** Niveles de Ansiedad en la Comunidad Estudiantil Odontológica. Universidad de La Frontera, Temuco-Chile. *Int J Odontostomat.* 2012;6(1):51-7. http://doi.org/chs8.

37. **Bathlan M, Singh M, Kulhara P, Chandna S, Aneja J.** Evaluation of anxiety, depression and suicidal intent in undergraduate dental students: A cross-sectional study. *Contemp Clin Dent.* 2015;6(2):215-22. http://doi.org/chtb.

38. **Al-Samadani KH, Al-Dharrab A.** The perception of stress among clinical dental students. *Word J Dent.* 2013;4(1):24-8. http://doi.org/chtc.

39. **Paudel S, Subedi N, Shrestha A.** Stress and its relief among undergraduate dental students in a tertiary health care centre in Eastern Nepal. *Dentistry.* 2013;3(157): 2161-1122. http://doi.org/chtd.

40. **Sánchez-Núñez, MT, Fernández-Berrocal P, Montañés-Rodríguez J, Latorre-Postigo JM.** ¿Es la inteligencia emocional una cuestión de género? Socialización de las competencias emocionales en hombres y mujeres y sus implicaciones. *Rev Electron Investig Psicoeduc Psigopedag.* 2008 [cited 2017 Oct 20];6(15):455-74. Available from: https://goo.gl/oiNazc.

41. **Extremera-Pacheco N, Durán-Durán MA, Rey L.** Inteligencia emocional y su relación con los niveles de burnout, engagement y estrés en estudiantes universitarios. *Rev Educ.* 2007 [cited 2017 Oct 19];342:239-56. Available from: https://goo.gl/f45dKN.

42. **Tangade PS, Mathur A, Gupta R, Chaudhary S.** Assessment of stress level among dental school students: an Indian outlook. *Dent Res J.* 2011 [cited 2016 Nov 23];8(2):95-101. Available from: https://goo.gl/ggp34y.

43. **Alzahem AM, Van der Molen HT, Alaujan AH, Schmidt HG, Zamakhshary MH.** Stress amongst dental students: a systematic review. *Eur J Dent Educ.* 2011;15(1):8-18. http://doi.org/dthqfw.

44. **Sanders AE, Lushington K.** Sources of stress for Australian dental students. *J Dent Educ.* 1999 [cited 2016 Dec 30];63(9):688-97. Available from: https://goo.gl/kgAN8W.

45. **Acharya S.** Factors Affecting Stress Among Indian Dental Students. *J Dent Educ.* 2003 [cited 2017 Apr 3];67(10):1140-8. Available from: https://goo.gl/u8fTjM.

46. **Kumar S, Dagli RJ, Mathur A, Jain M, Prabu D, Kulkarni S.** Perceived sources of stress amongst Indian dental students. *Eur J Dent Educ.* 1999;13(1):39-45. http://doi.org/b89dkh.

47. **Galán F, Ríos-Santos J, Polo J, Rios-Carrasco B, Bullón P.** Burnout, depression and suicidal ideation in dental students. *Med Oral Patol Oral Cir Bucal.* 2014;19(3):e206-11. http://doi.org/chth.

48. **Reyes-Torres M, Ríos-Santos JV, López-Jiménez A, Herrero-Climent M, Bullón-Fernández P.** Job satisfaction and depression in the Spanish Society of Periodontology and Research (SEPA) members, and their relation to the burnout syndrome. Creation of a structural model. *Med Oral Pat Oral Cir Bucal.* 2012;17(5):e821-4. http://doi.org/chtj.

49. **Picasso-Pozo M, Huillca-Castillo N, Ávalos-Marquez J, Omori-Mitumri E, Gallardo-Schultz A, Salas-Chavez M.** Síndrome de burnout en estudiantes de Odontología de una universidad peruana. *Revista Kiru.* 2015 [cited 2017 Apr 16];9(1):51-8. Available from: https://goo.gl/crQKV2.

50. **Sufia S.** Burnout among Undergraduate Dental Students at a Public Academic Institution in Karachi, Pakistan. *JPDA.* 2016 [cited 2017 May 19];25(4):131-6. Available from: https://goo.gl/prwy73.