



Perception of Environment Stressors in Chilean Dentistry Students

Juan Fonseca-Molina¹, Pilar Alejandra Torres-Martínez¹, Carolina Alejandra Barrios-Penna¹,
Marcelo Fernández-Sagredo¹, Víctor Patricio Díaz-Narváez²

¹Dentistry Department, Faculty of Dentistry, Universidad San Sebastián, Concepción, Chile.

²Dentistry Department, Faculty of Dentistry, Universidad San Sebastián, Santiago, Chile.

Author to whom correspondence should be addressed: Professor Pilar Torres-Martínez, Faculty of Dentistry, Universidad San Sebastián, Lientur #1457, Concepción, Chile. E-mail: Pilar.torres@uss.cl.

Academic Editors: Alessandro Leite Cavalcanti and Wilton Wilney Nascimento Padilha

Received: 06 October 2017 / Accepted: 26 December 2017 / Published: 04 January 2018

Abstract

Objective: To evaluate the stress factors perceived by dentistry students at the beginning of the academic year, according to academic year and gender. **Material and Methods:** Descriptive, exploratory, non-experimental, cross-sectional study. The DES30-Sp survey was applied, at the beginning of the first semester 2016 to a sample of 495 dentistry students from first to 5th year of Universidad San Sebastián, Concepción. The Statistical tests used were the Kolmogorov-Smirnov (K-S) and Levene homoscedasticity studies. The internal reliability of the data was estimated using the Cronbach's alpha and the intraclass correlation coefficient. Mean, standard deviation and standard error were estimated. Comparisons between courses and gender were made using the General Multivariate ANOVA (Model III) using the tracers Pillai, Lambda de Wilks and Trace de Hotelling. The level of significance was $\alpha \leq 0.05$ and $\beta \geq 0.80$. **Results:** It is observed that all three estimators were highly significant ($p = 0.0005$) for the Course and Gender factor. Stress increased steadily as the courses progressed with little inflection in all components of stress and in general stress. Women appeared with a higher perception than men in all components. **Conclusion:** There is a generalized stress in all the courses and it increases in the superior ones. The perception of the factors of stress varies according to the course and is greater in women.

Keywords: Perception; Stress, Psychological; Environment; Students, Dental.

Introduction

Stress is defined as the relationship between an individual and the environment, being a psychosocial factor in which some of its characteristics are perceived as a threat to physical or mental health [1]. Previous author identified the stress response as a physiological reaction related to the hypothalamic-pituitary-adrenocortical axis, elevated corticoid secretion, and sympathetic-medulla-adrenal axis, as a response to nonspecific stimuli or stressors [1]. A stressor is an event capable of producing change and stress, although not necessarily always triggered by the individual's reaction [2]. It should be kept in mind that every individual is exposed to stressors during life, however, not everyone reacts the same.

This difference in response is explained by the different individual capacities to cope with this stress, determining the possible occurrence of a condition. Social support can improve the capacity to cope with stress, thanks to instrumental, informative and emotional assistance to the individual [2].

Academic stress seems to be related to the emotional intelligence of a person, so that the more skillful the perception and understanding of the emotions of others, the better their skills for the regulation and coping of stress [3]. This stress can lead to sleep disorders, permanent tiredness, headaches, digestion problems, drowsiness and mental health disorders [4-6].

When assessing stress in dentistry students, compared to students in other health careers, it seems that in the dental career this is higher [7-9]. Therefore, the perception of academic stress is essential to provide valuable feedback on the efficiency and acceptability of educational methods, especially in dentistry students, who even in the early stages of their education can already demonstrate signs or predisposition to burnout syndrome, which implies emotional exhaustion, depersonalization and reduction of personal achievement [10,11]. There is evidence of different stressors perceived by first year dentistry students [3], understanding perception as an idea or knowledge of something through the senses; However, so far, there are few studies that evaluate these in students from first to sixth year at the beginning of their academic year, which would allow it to adopt preventive measures and minimize the negative effects of stress on Dentistry students.

The aim of this study is to evaluate the stress factors perceived by dentistry students at the beginning of the academic year, according to academic year and gender.

Material and Methods

Study Design and Population

This is a descriptive, exploratory, non-experimental, cross-sectional study. The population was constituted by all Dentistry students between first and fifth year from Universidad San Sebastián (USS), Concepción, Chile, in the year 2016.

Sample

The sample was 495 students, selected for convenience and according to the inclusion and exclusion criteria of the study. Inclusion criteria included Dentistry students from first-year to fifth-year from the USS Concepcion officially enrolled in 2016. The exclusion criteria consisted of students absent on the day of application of the questionnaire; students who did not wish to participate in the study, and students who did not sign informed consent.

Data Collection

The DES30-Sp survey was applied to students, at the beginning of the first semester to be completed with pencil the first week of May 2016, date related to the beginning of student life. In addition they had spent a month of immersion in an educational environment, acquiring in this way an idea or knowledge about what will be his university career. Class size, leisure time, assessment procedures, peer and professor relationships, ethical climate, extracurricular opportunities, beliefs, attitudes and sociocultural background significantly influence the way students perceive and experience their education [11-13].

The Garbee's Dental Environment Stressors modified previously by some authors [13,14] has been widely used in research studies in Europe, Japan and Australia [2,15,16-19]. Some reserachers [14] reviewed the instrument, presenting a 30-item version that was later used in multinational [20] and longitudinal studies [21] among dental students as well as postgraduate students [22-23].

DES30 Sp is an instrument validated in Spanish and in Chile [24] and contains 30 items regarding stressful dental educational environments that students must classify on a scale according to their potential source of stress.

In this way they assign a score 1 to a factor that is not at all stressful, 2: something stressful, 3: quite stressful and 4: very stressful. This instrument includes stressors such as "qualifications and exams", "lack of time for relaxation", "patients arrived late or did not make their appointment", "lack of confidence to be a successful student" and "difficulty of assigned class work", among others. It has good psychometric properties (Cronbach's alpha = 0.89) and is easy to use. It's application time is approximately 15 to 20 minutes [24].

Statistic Analysis

Data on the mean levels of stress at the date of data collection, and in the gender were subjected to Kolmogorov-Smirnov (K-S) and Levene homoscedasticity studies. The internal reliability of the data was estimated using the general Cronbach's alpha and the intraclass correlation coefficient. Subsequently, the mean, standard deviation and standard error of the mean in each course, in both genders, was estimated for general stress and in each of its dimensions.

Comparisons between courses and between genders and in each interaction between these two factors in each of the components of stress and stress in general were made. Comparisons between courses and gender were performed using a general multivariate linear model (ANOVA,

Model III) using the Pillai's trace, Wilks's lambda and Hotelling's trace. The level of significance was $\alpha \leq 0.05$ and $\beta \geq 0.80$.

Ethical Aspects

Participation in the study was voluntary and maintained the confidentiality of students. It was carried out in accordance with the ethical principles of the Helsinki Declaration, after signing an informed consent.

Results

The sample consisted of 495 students. The Cronbach's alpha was satisfactory (untypified and typified = 0.901), from which it is inferred that the data have internal reliability. The intraclass correlation coefficient was 0.901 ($F = 10.05$, $p = 0.001$), with a confidence interval of $[0.887; 0.913]$, which confirms the good internal reliability of the data.

Table 1 presents the results of the mean, standard error of the mean and the confidence interval of the standard error of the mean in each stress component and in the gender in each of the stress dimensions studied. The mean in the female gender in "Academic performance" dimension was higher (2.929) compared to the same dimension in the male gender (2.741).

Table 1. Results of the estimation of the mean, standard error of the mean and the confidence interval of the standard error of the mean in each stress component and in gender.

Dependent Variables	Gender	Mean	Standard Error	95% Confidence Interval	
				Lower limit	Upper limit
Self Efficacy Beliefs	Female	2.898	0.039	2.820	2.975
	Male	2.634	0.048	2.540	2.728
Faculty and Administration	Female	2.625	0.032	2.562	2.688
	Male	2.477	0.039	2.400	2.554
Academic Work	Female	2.890	0.030	2.830	2.949
	Male	2.683	0.037	2.611	2.755
Treatment of Patients	Female	2.966	0.038	2.891	3.041
	Male	2.757	0.047	2.666	2.849
Clinical Training	Female	2.487	0.045	2.398	2.575
	Male	2.270	0.055	2.162	2.378
Academic Performance	Female	2.929	0.041	2.849	3.010
	Male	2.741	0.050	2.643	2.840
Others	Female	2.570	0.036	2.500	2.640
	Male	2.340	0.043	2.255	2.425
Stress	Female	2.721	0.027	2.668	2.773
	Male	2.514	0.032	2.450	2.577

Table 2 presents the results of the mean, standard error of the mean and the confidence interval of the standard error of the mean in each stress component, the course and in gender. The stress dimension in the fifth year is the highest in women (2.925) and men (2.706).

Table 2. Results of the mean estimation, standard error of the mean and the confidence interval of the standard error of the mean in each component of the stress, the course and in gender.

Dependent Variables	Course	Gender	Mean	Standard Error	95% Confidence Interval	
					Lower limit	Upper limit
Self Efficacy Beliefs	First	Female	2.708	0.091	2.528	2.887
		Male	2.458	0.121	2.220	2.696
	Second	Female	3.013	0.077	2.863	3.164
		Male	2.648	0.090	2.471	2.826
	Third	Female	2.845	0.094	2.661	3.029
		Male	2.609	0.098	2.417	2.801
	Fourth	Female	2.978	0.087	2.807	3.150
		Male	2.592	0.098	2.400	2.785
	Fifth	Female	2.944	0.090	2.767	3.122
		Male	2.862	0.123	2.620	3.104
Faculty and Administration	First	Female	2.468	0.074	2.322	2.614
		Male	2.250	0.099	2.056	2.444
	Second	Female	2.391	0.062	2.268	2.514
		Male	2.357	0.074	2.212	2.501
	Third	Female	2.590	0.076	2.440	2.741
		Male	2.369	0.080	2.213	2.526
	Fourth	Female	2.604	0.071	2.464	2.744
		Male	2.500	0.080	2.344	2.657
	Fifth	Female	3.071	0.074	2.926	3.215
		Male	2.908	0.100	2.711	3.106
Academic Work	First	Female	2.887	0.070	2.749	3.024
		Male	2.633	0.093	2.450	2.815
	Second	Female	2.673	0.059	2.558	2.789
		Male	2.525	0.069	2.389	2.661
	Third	Female	2.886	0.072	2.745	3.028
		Male	2.688	0.075	2.541	2.836
	Fourth	Female	2.928	0.067	2.797	3.059
		Male	2.681	0.075	2.533	2.828
	Fifth	Female	3.074	0.069	2.938	3.210
		Male	2.890	0.095	2.704	3.075
Treatment of Patients	First	Female	2.792	0.089	2.618	2.967
		Male	2.511	0.118	2.279	2.742
	Second	Female	2.902	0.075	2.756	3.049
		Male	2.746	0.088	2.574	2.919
	Third	Female	3.047	0.091	2.867	3.226
		Male	2.957	0.095	2.770	3.144
	Fourth	Female	3.063	0.085	2.897	3.230
		Male	2.732	0.095	2.545	2.919
	Fifth	Female	3.025	0.088	2.852	3.198
		Male	2.839	0.120	2.604	3.075
Clinical Training	First	Female	2.198	0.104	1.993	2.403
		Male	2.250	0.139	1.977	2.523
	Second	Female	2.527	0.088	2.354	2.699
		Male	2.231	0.103	2.028	2.435
	Third	Female	2.610	0.107	2.399	2.821
		Male	2.576	0.112	2.356	2.796
	Fourth	Female	2.414	0.100	2.218	2.610
		Male	2.207	0.112	1.986	2.427
	Fifth	Female	2.685	0.103	2.482	2.888
		Male	2.086	0.141	1.809	2.363
Academic Performance	First	Female	2.755	0.095	2.568	2.942
		Male	2.567	0.127	2.318	2.815
	Second	Female	2.827	0.080	2.669	2.984
		Male	2.833	0.094	2.648	3.019
	Third	Female	2.920	0.098	2.727	3.113
		Male	2.478	0.102	2.277	2.679
	Fourth	Female	2.914	0.091	2.735	3.093
		Male	2.880	0.102	2.680	3.081
	Fifth	Female	3.231	0.094	3.046	3.417
		Male	2.948	0.129	2.695	3.201

Others	First	Female	2.528	0.082	2.366	2.690
		Male	2.266	0.109	2.051	2.481
	Second	Female	2.455	0.069	2.319	2.591
		Male	2.361	0.082	2.201	2.522
	Third	Female	2.469	0.085	2.302	2.635
		Male	2.277	0.088	2.103	2.450
	Fourth	Female	2.609	0.079	2.454	2.763
		Male	2.270	0.088	2.097	2.444
	Fifth	Female	2.791	0.082	2.631	2.951
		Male	2.526	0.111	2.308	2.745
Stress	First	Female	2.614	0.062	2.492	2.735
		Male	2.382	0.082	2.220	2.543
	Second	Female	2.617	0.052	2.515	2.720
		Male	2.483	0.061	2.363	2.604
	Third	Female	2.701	0.064	2.576	2.826
		Male	2.498	0.066	2.368	2.629
	Fourth	Female	2.746	0.059	2.630	2.862
		Male	2.499	0.066	2.369	2.630
	Fifth	Female	2.925	0.061	2.805	3.046
		Male	2.706	0.084	2.541	2.870

Table 3 shows the results of the estimation of the Pillai's trace, Wilks's lambda and Hotelling's trace, Eta Squared and Power Test. The F test of the statisticians was highly significant ($p < 0.0001$) in the independent factors, but not significant ($p > 0.05$) in the interaction of the studied factors.

Table 3. Results of the estimation of the Pillai's trace, Wilks's lambda and Hotelling's trace, Eta squared and Power test.

Factors		Value	F	Sig.	Eta Partial Squared	Observed Power
Course	Pillai's trace	0.324	5.294	0.000	0.081	1.000
	Wilks's lambda	0.705	5.481	0.000	0.084	1.000
	Hotelling's trace	0.379	5.642	0.000	0.087	1.000
Gender	Pillai's trace	0.057	3.592	0.000	0.057	0.984
	Wilks's lambda	0.943	3.592	0.000	0.057	0.984
	Hotelling's trace	0.060	3.592	0.000	0.057	0.984
Course * Gender	Pillai's trace	0.091	1.400	0.068	0.023	0.985
	Wilks's lambda	0.912	1.403	0.067	0.023	0.974
	Hotelling's trace	0.094	1.404	0.066	0.023	0.985

*Interaction between course and gender.

It is observed that all three estimators were highly significant ($p = 0.0005$) for the Course and Gender factor; the values of Eta squared and power of the test were very satisfactory, therefore, the statistical differences found were large and the sample size was sufficient. However, the interaction between the above factors was not significant in any of the statisticians studied ($p > 0.05$) and can be interpreted by the absence of such interaction.

Finally, Figures 1 to 7 show the behavior of the means in each of the factors studied. In all of them, it was found that: a) stress increased steadily as the courses progressed with little inflection in all components of stress and in general stress; b) women appeared with a higher perception than men in all components.

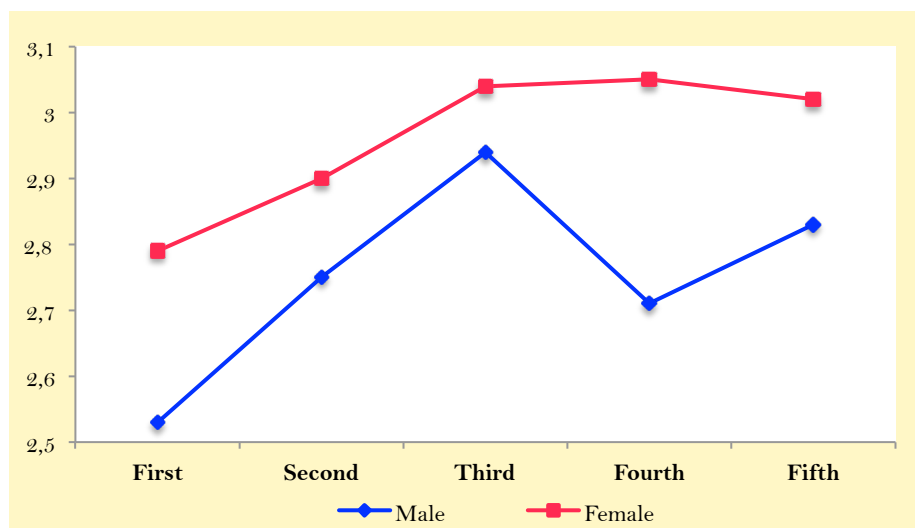


Figure 1. Behavior of the means in the dimension "Treatment of Patients".

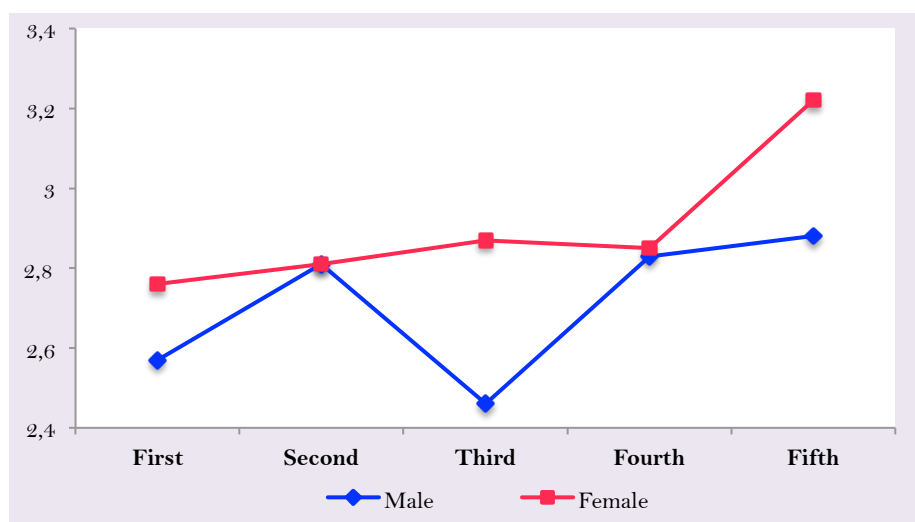


Figure 2. Behavior of the means in the dimension "Academic Performance".

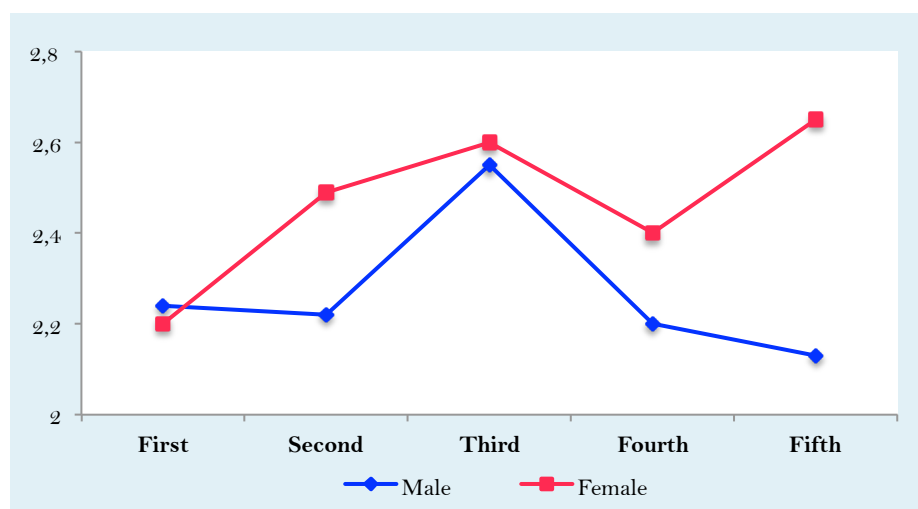


Figure 3. Behavior of the means in the dimension "Clinical Training".

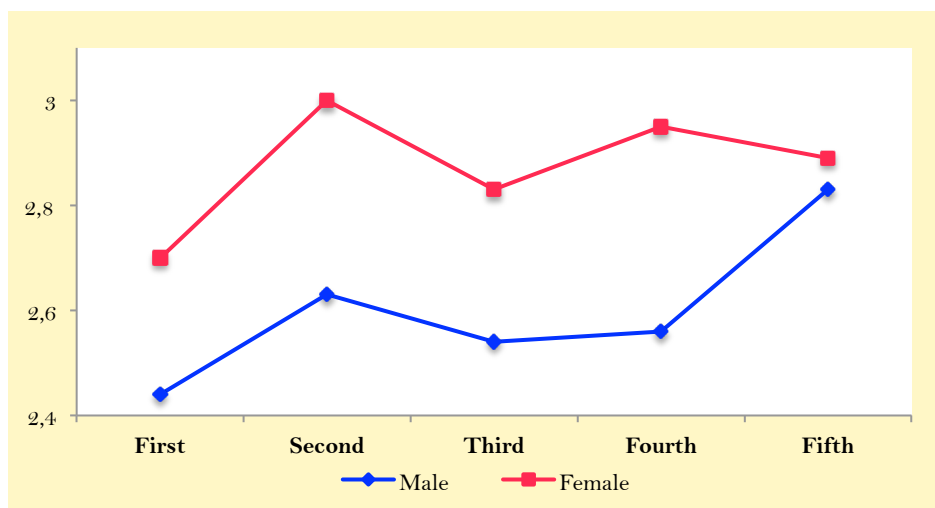


Figure 4. Behavior of the means in dimension “Self-efficacy Beliefs”.

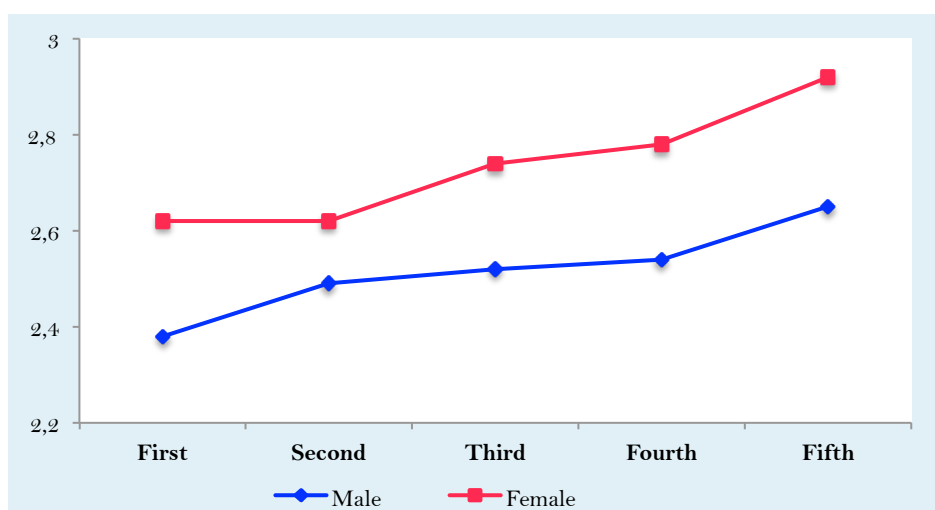


Figure 5. Behaviour of means in the dimension “Stress”.

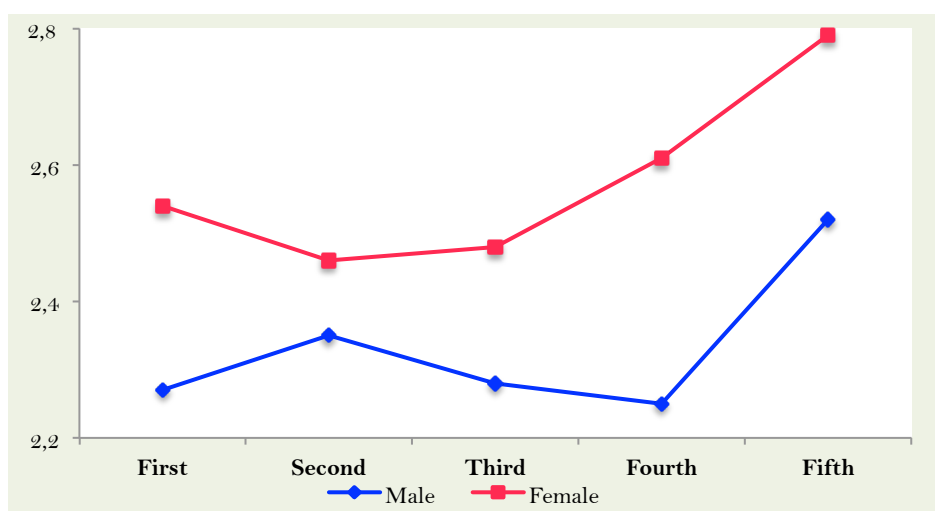


Figure 6. Behaviour of means in the dimension “Others”.

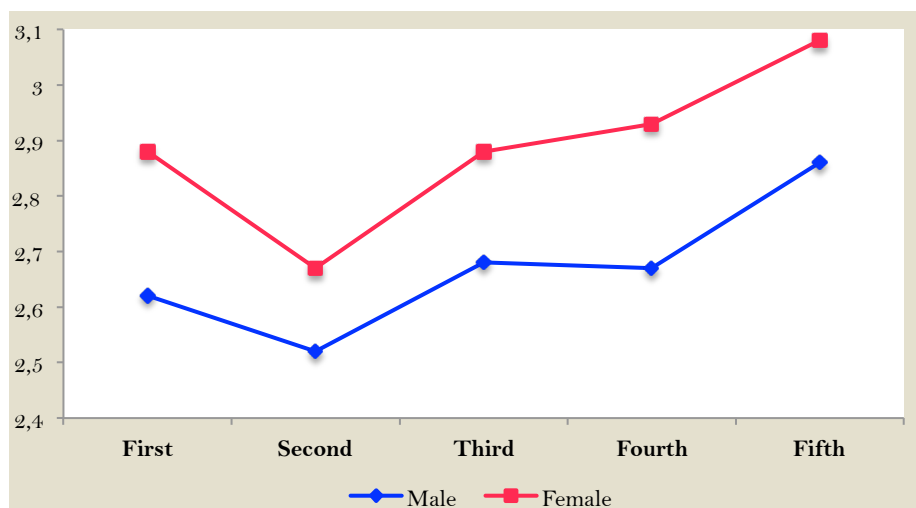


Figure 7. Behavior of means of the dimension “Academic Work”.

Discussion

College students are increasingly facing demands and challenges that demand a great deal of physical and psychological resources. It has been established that it is not the stressor per se that causes stress, but the individual's perception of the stressor and that the individual's expectations about environmental goals or demands, can be perceived positively as challenges or negatively as threats [24].

From the results obtained in this study it can be emphasized that there is a generalized stress in all the courses, which increases gradually as they progress in their academic development. This is in line with others research that also used the DES questionnaire [2,6,8,19,24], but differs from other studies [7,12,25,26]. The perception of stress does not depend on the progress of the course, but would be influenced by gender and the first option of studying dentistry [12]. Third-year students had the highest levels of perceived stress, which they attribute to the transition phase from pre-clinical to clinical, where they begin to relate with patients and meet requirements [7,25]. On the other hand, some authors reported that the first two years of the career, students have greater perception of stress [26]. Given these results, it can be deduced that there would seem to be other factors that influence the stress levels according to the course and it is necessary to investigate further.

It is emphasized that all courses and all components of the questionnaire had stress levels with scores of 2 or more points, which means a perception of moderate to severe stress. This result is similar to other studies [2,12,13,15,16,19,20] and although there are no standardized scores for DES, scores 2 and higher may suggest the presence of elevated levels of stress [15]. This could be explained by the fact that as the academic year progresses, the career requires that the student develop greater skills, both clinical and soft skills, as well as group work being replaced by the individual work where the student takes over of their own learning and the professor participates as a guide or facilitator. In addition, the work is done in separate dental cubicles, which promote

individualism and competition (curriculum), losing the identity group and teamwork that had developed through the academic level. All this, evidence that Dentistry is a highly stressful career.

Regarding gender, the results indicate that in all courses women have a higher perception of stress than men, which is consistent with numerous studies [2,6,12,13,23,28]. The higher levels of stress in women can be explained by different patterns of response to stressful events by gender and also suggested that differences in intensity of response to perceived stressors could be explained by the different patterns of psychological morbidity and the social construction of masculinity, in which men are less expressive about their concerns. This may also be due to the fact that women may have more maturity and be more receptive, in addition to having greater interpersonal skills and more adept at perceiving and understanding emotions [29].

On the other hand, there are studies that found that men presented greater stress than women [25,30]. Previous study showed that, in preclinical and clinical years, men reported the highest levels of stress [25]. Both studies were carried out in India so apparently the formative educational factor could be another variable to consider when assessing perception of stress.

The analysis of the results revealed that there is a difference in the perception of stress factors between men and women in the different years of study, which agrees with previous findings [20,24,31]. "Academic Performance", "Self-efficacy Belief" and "Treatment of Patient" are more stressful (in terms of mean) for women in the preclinical years, while "Academic Workload", "Academic Performance" and "Treatment of Patient" are for men in those same years. Similar results have been obtained in other investigations [13,16], however none of these studies mention that in the years prior to patient care, students without gender discrimination, are already worried about a possible patient unpunctuality, lack of communication with them and/or fear that the patient does not declare the existence of a contagious disease, a situation that is reflected in the results obtained in the present investigation.

In the 5th year men and women agree that "Academic Performance" is a stressful factor. Additionally in this academic year, women have a higher value in the "Treatment of Patients", "Academic Workload" and "Faculty and Administration". This may be due to the fact that women have more empathy that serves the foster care system. Also, since childhood, the relationship between female gender and emotional competence has been close due to socialization in contact with feelings and their nuances [29].

It is suggested that the University reinforce its support services, counseling and interventions to the students, because even though they exist, they are often underestimated. In addition, a way to reduce this anxiety regarding patient care, it is necessary that the students come into contact with them from first year, making routine visits to the clinic and watching how it functions and also, that professors of Preclinical courses conduct counseling on good patient management practices.

This study presents limitations, since it was evaluated only to one career and applied in a single moment, not tracking students to know how the perception evolves to stress factors over time.

Therefore, it is suggested to carry out studies that consider a larger population, incorporating different schools of dentistry, and in a longitudinal manner over time.

Conclusion

There is a generalized stress in all the courses and it is increased in the superior ones. The perception of the factors of stress varies according to the course and is greater in women.

References

1. Selye H. Stress without distress. London: Corgi, 1987. 140p.
2. 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):1021-30.
3. Elani HW, Allison PJ, Kumar RA, Mancini L, Lambrou A, Bedos C. A systematic review of stress in dental students. *J Dent Educ* 2014; 78(2):226-42.
4. 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 (1):90. doi: 10.1186/s12909-016-0612-6.
5. 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. doi: 10.2147/AMEP.S46211.
6. 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. doi: 10.1016/j.ksujds.2012.11.002.
7. 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. doi: 10.2147/AMEP.S46214.
8. 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; 77(10):1345-55.
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; 13(3):429-36.
10. Opoku-Acheampong A, Kretchy IA, Acheampong F, Afrane BA, Ashong S, Tamakloe B, et al. Perceived stress and quality of life of pharmacy students in University of Ghana. *BMC Res Notes* 2017; 10(1):115. doi: 10.1186/s13104-017-2439-6.
11. Divaris K, Barlow PJ, Chendea SA, Cheong WS, Dounis A, Dragan IF, et al. The academic environment: the students' perspective. *Eur J Dent Educ* 2008; 12(Suppl 1):120-30. doi: 10.1111/j.1600-0579.2007.00494.x.
12. Sugiura G, Shinada K, Kawaguchi Y. Psychological wellbeing and perceptions of stress amongst Japanese dental students. *Eur J Dent Educ* 2005; 9(1):17-25. doi: 10.1111/j.1600-0579.2004.00352.x.
13. Westerman GH, Grandy TG, Ocanto RA, Erskine CG. Perceived sources of stress in the dental school environment. *J Dent Educ* 1993; 57(3):225-31.
14. Polychronopoulou A, Divaris K. Perceived sources of stress among Greek dental students. *J Dent Educ* 2005; 69(6):687-92.
15. Elani H, Allison P, Ritu A. Kumar, Mancini L, Lambrou A, Bedos C. A systematic review of stress in dental students. *J Dent Educ* 2013; 78(2):226-42.
16. Yap AU, Bhole S, Teo CS. A cross-cultural comparison of perceived sources of stress in the dental school environment. *J Dent Educ* 1996; 60(5):459-64.
17. Muirhead V, Locker D. Canadian dental students' perceptions of stress and social support. *Eur J Dent Educ* 2008; 12(3):144-8. doi: 10.1111/j.1600-0579.2008.00512.x
18. Sofola OO, Jeboda SO. Perceived sources of stress in Nigerian dental students. *Eur J Dent Educ* 2006; 10(1):20-3. doi: 10.1111/j.1600-0579.2006.00391.
19. Morse Z, Dravo U. Stress levels of dental students at the Fiji School of Medicine. *Eur J Dent Educ* 2007; 11(2):99-103. doi: 10.1111/j.1600-0579.2007.00435.x.
20. Polychronopoulou A, Divaris K. Dental students' perceived sources of stress: A multi-country study. *J Dent Educ* 2009; 73:631-9.
21. Polychronopoulou A, Divaris K. A longitudinal study of Greek dental students' perceived sources of stress. *J Dent Educ* 2010; 74(5):524-30.

22. Divaris K, Heuberger CS, Polychronopoulou A, Eliades T, Katsaros C. Stress and burnout among Swiss dental residents. *Schweiz Monatsschr Zahnmed* 2012; 122(7-8):610-15.
23. Divaris K, Polychronopoulou A, Taoufik K, Katsaros C, Eliades T. Stress and burnout in postgraduate dental education. *Eur J Dent Educ* 2012; 16(1):35-42.
24. 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. doi: 10.1111/eje.12004.
25. Kumar S, Dagli RJ, Mathur A, Jain M, Prabu D, Kulkarni S. Perceived sources of stress amongst Indian dental students. *Eur J Dent Educ* 2009; 13(1):39-45. doi: 10.1111/j.1600-0579.2008.00535.x.
26. Newton JT, Baghaienaini F, Goodwin SR, Invest J, Lubbock M, Saghakhaneh NM. Stress in dental schools: A survey of students. *Dent Update* 1994; 21(4):162-4.
27. Sangiorgio JPM, Araujo PM, Navarro CH, Zen IR, Costa SC, Ribeiro PHV, et al. Dental environment stress: Findings among Lusophone dental students. *Braz Res Ped Dent Integr Clin* 2016; 16(1):411-24. doi: 10.4034/PBOCI.2016.161.
28. Garbee WH, Zucker SB, Selby GR. Perceived sources of stress among dental students. *J Am Dent Assoc* 1980; 100 (6):853-7 . doi: 10.14219/jada.archive.1980.0279.
29. Bartels A, Zeki S. The neural correlates of maternal and romantic love. *Neuroimage* 2004; 21(3):1155-66. doi: 10.1016/j.neuroimage.2003.11.003.
30. Acharya S. Factors affecting stress among Indian dental students. *J Dent Educ* 2003; 67(10):1140-8.
31. Silverstein ST, Kritz-Silverstein D. A longitudinal study of stress in first-year dental students. *J Dent Educ* 2010, 74(8):836-48.