A Five-year Comparative Study of Perceived Stress Among Dental Students at Two European Faculties

Maria S. Manolova1, Vessela P. Stefanova1, Neshka A. Manchorova-Veleva1, Ivan V. Panayotov2,4, Bernard Levallois2,4, Paul Tramini5,6, Valérie Orti3,4

1 Department of Operative Dentistry and Endodontics, Faculty of Dental Medicine, Medical University of Plovdiv, Plovdiv, Bulgaria
2 Department of Conservative Dentistry and Endodontics, Faculty of Dentistry, Montpellier University, Montpellier, France
3 Department of Periodontology, Faculty of Dentistry, Montpellier University, Montpellier, France
4 Laboratory of Bioengineering and Nanoscience, Montpellier University, Montpellier, France
5 Department of Dental Public Health, Faculty of Dentistry, Montpellier University, Montpellier, France
6 Laboratory of Epidemiology and Biostatistics, Montpellier University, Montpellier, France

Correspondence:
Maria S. Manolova, Department of Operative Dentistry and Endodontics, Faculty of Dental Medicine, Medical University of Plovdiv, 3 Hristo Botev Blvd., 4000 Plovdiv, Bulgaria
E-mail: mimaci@yahoo.com
Tel: +359887322776

Received: 29 Mar 2018
Accepted: 30 Aug 2018
Published Online: 10 Sept 2018
Published: 31 Mar 2019

Key words: dental students, stress sources, stress level, education

Citation: Manolova MS, Stefanova VP, Manchorova-Veleva NA, Levallois B, Panayotov IV, Tramini P, Orti V. A five-year comparative study of perceived stress among dental students at two European faculties. Folia Med (Plovdiv) 2019;61(1): doi: 10.2478/folmed-2018-0052

Aim: To compare the levels, causes and the impact of stress from cohort of fifth-year dental students in the Faculties of Dental Medicine in Plovdiv, Bulgaria and Montpellier, France.

Materials and methods: The questionnaire we used comprised the modified version of the 56-item Dental Environment Stress (DES) questionnaire. It was completed by fifth-year undergraduate dental students in both faculties in 2011 and 2016, totaling 335 dental students. A five-point Likert scale was used to record the responses from the subjects. Statistical analysis was performed with STATA version 14.1 (StataCorp, College Station, USA) specialized software.

Results: The mean age of studied population was not significantly different between 2011 and 2016 (p=0.08). The common stress value per student was 1.74 (CI: 1.64; 1.84, range: 0.12; 4.50). It was higher in Plovdiv (1.79±0.81) than in Montpellier (1.63±0.66); it was statistically higher for girls (1.94±0.70) than for boys (1.49±0.77), and decreased between 2011 and 2016. A significant overall effect of the common mean stress was influenced by the town (p=0.008), year of study (p=0.003), gender (p=0.0001) and accommodation (p=0.01) of the student.

Conclusion: Academicals and clinical factors of stress are prevailing stressors during education. The challenge is now to decrease the influence of both, without altering the quality of dental education. Regular discussions and debriefs about the clinical cases before and after clinical activity. Alternative methods of education and examination, such as interactive methods, could be considered in order to reduce the stress of theoretical exams.

BACKGROUND

Dental profession is considered to be one of the most stressful health professions.1,2 Stress has been defined by Cox (1978) as a “stimulus, a response or the result of an interaction or some imbalance between the leaving organism and the environment”.3 Krohne (2002) states that external demands (stressors) and experienced by the body (stress) can be placed into two categories.4 One of these is the systematic stress (Selye 1976) that is associated with physiological or psychobiological factors. The other is the psychological stress that is associated with cognitive psychology.5,6

According to Anna C. Phillips (2013) perceived stress is the feelings or thoughts that an individual has about how much stress they are under at a given point in time or over a given time period. Perceived stress incorporates feelings about the uncontrollability and unpredictability of one’s life, how often one has to deal with irritating hassles, how much change occurs in one’s life, and confidence in one’s ability to deal with problems or difficulties. It is not measuring the types or frequencies of stressful events which have happened to a person, but rather how an individual feels about the general stressfulness of their life and their ability to handle such
Comparative Study of Dental Student Stress in Two European Faculties

stress. Individuals may suffer similar negative life events but appraise the impact or severity of these to different extents as a result of factors such as personality, coping resources, and support.7

During their education, dental students are exposed to stress factors, which are unbearable for some of them and could be a reason to quit their training. Prolonged stress has been related to several adverse health outcomes.8 Stress affected individuals’ immune response system, increased risk of heart disease and was related to negative psychological consequences such as burnout9, depression and suicide3,10.

These stress factors could have different origins: stress factors related to the education and the life in the university; stress factors related to the dental practice and the communication with the patients and factors with extra-university character.11-14 Some of them are more frequently reported: the combination of time pressure, frightened patients, financial problems, staff supervision and the routine and boring work regime.15 The persistence of stress-related symptoms in dental students’ comportment may result in mental and/or physical disorder, substance abuse, and diminished efficiency at work or learning.12,16

Dental education in the European countries was submitted on high evaluation criteria in order to increase the quality of the university education in dental faculties.17 This approach is understandable because dental diplomas are recognized in Europe. At the same time, the economic development and the quality of life in different European countries are not equal. By consequence, this disproportion could produce an unbalance in a dental student’s environment in the different countries and it could influence the importance of different stress factors during the education.

Several studies aiming to compare the level of stress of dental students between different European countries have been previously reported.18-20 However, most of these studies are cross-sectional so that variations over-time are unknown.

AIM

To compare the stress levels of dental students in Bulgaria and in France. In this paper we present the results of a five-year comparative study conducted between 2011 and 2016 in the Faculties of Dentistry of Montpellier (France) and Plovdiv (Bulgaria). We compared the dental students in the two countries, showing different socio-economic status and different historical charge influencing their educational system.

MATERIALS AND METHODS

The study included 335 fifth-year undergraduate dental students from the dental faculties of Montpellier University (France) and Plovdiv Medical University (Bulgaria). Since French and Bulgarian dental students follow a 6-year curriculum, they were therefore evaluated one year before their graduation. The fifth-year dental students in 2011 completed a questionnaire, this survey being conducted again five years later, with the fifth-year dental students of 2016. One hundred and fifteen students in Montpellier (57 in 2011 and 58 in 2016) and 220 in Plovdiv (112 in 2011 and 108 in 2016) were asked to fill out the questionnaire after a lecture at the respective dental schools. The students were also asked additional questions about their socio-demographic status and their living conditions. Five students were absent in Montpellier (one in 2011 and four in 2016) and nine in Plovdiv (three in 2011 and six in 2016).

The questionnaire was based on the Dental Environment Stress (DES) questionnaire developed by Garbee WH et al. (1980), where 34 items were retained out of 38, with a six point Lickert-scale (from 0 to 5) focusing on the perceived level of stress. This modified questionnaire was validated by Al-Omari et al. in 2005 (Al-Omari, 2005) and adapted for the studied populations. The items were divided in five major groups (stress factor groups): living conditions (factor I), personal factors (factor II), academic work (factor III), clinical environment (factor IV) and clinical education (factor V) (Table I).

A two-way translation was performed by two professional translators from English to French and backward from French to English. The same procedure was performed between English and Bulgarian. To test the internal consistency of the French translation of the scale, reliability analysis by alpha Cronbach was used. The overall Cronbach’s for the reliability of the modified DES questionnaire was 0.93, and the overall inter-item covariance was 0.55. Statistical analysis was performed with STATA v14.1 (StataCorp, College Station, USA) specialized software. Each item mean scores were compared for both faculties, year of education, gender (Student’s t-test). Categorical variables were compared with the chi-squared test. Then a general score per student was generated from the 34 items and an ANOVA was performed to test the effect of the demographic characteristic on this score. Pairwise correlations were tested with Spearman’s rank test, with Bonferroni correction.

The present study was approved by the et-
ics committees of the Montpellier University and Plovdiv Medical University, since all the students were assured of the anonymity of the data. Verbal consent was obtained from all the dental students who took part in this survey.

RESULTS

SOCIODEMOGRAPHIC VARIABLES ANALYSIS

The mean age of responders in Montpellier and Plovdiv was 23.32 years (SD: 1.29) and 23.92 years (SD: 1.56), respectively. The statistical difference was significant (p=0.001). Males were not significantly older than females (23.84 years in Montpellier and 23.61 years in Plovdiv). There was no statistically significant difference between the mean ages of students in France and in Bulgaria for 2011 and 2016 (p=0.08).

The proportion of students living with their parents was significantly lower in Montpellier (9.6%) than in Plovdiv (35.5%) (p<0.0001). Separate analyses per town showed that in Plovdiv Dental Faculty, the percentage of students living with their parents significantly increased between 2011 and 2016 (from 27.6% to 41.8%, p=0.03). In Montpellier, the increase was not significant. The overall proportion of students living with their parents significantly increased from 2011 (20.5%) to 2016 (32.5%; p=0.01). Globally, the percentage of students who travelled less than 5 min between their accommodation places to the respective Dental Faculty was threefold higher in 2016. In Montpellier, 56.9% of students assessed their environment for study as good, and 34.1% did so in Plovdiv (p<0.0001). The students from the Plovdiv Dental Faculty visited their parents more frequently than did the students from Montpellier (p=0.01). No statistical difference was found comparing these variable for 2011 and for 2016 (p=0.39). The most preferred disciplines for dental students in Montpellier were ‘oral surgery’ and ‘periodontology’, while in Plovdiv - ‘conservative dentistry’ and ‘oral surgery’. In Montpellier, the preferred disciplines were not significantly different between males and females (p=0.49), while there was a statistically significant difference in Plovdiv (p<0.0001): males did chose ‘prosthodontics’ while females preferred ‘pediatric dentistry’ and ‘orthodontics’. Personal preference of dental topics did not change between 2011 and 2016 in both towns.

COMMON STRESS OF DENTAL STUDENTS

We analyzed first the students’ common stress in both faculties in 2011 and in 2016. The common stress value per student was the mean response value of 34 items of the questionnaire. The overall mean common stress was 1.74 (CI: 1.64; 1.84, range: 0.12; 4.50). Histogram of the mean common stress per student showed a normal distribution (Shapiro-Wilk normality test, Fig. 1A). The highest density

Table 1. Analysis of variance of the mean stress in the five groups of stress factors (p-values)

| Factor                        | Overall | I    | II   | III  | IV   | V    |
|-------------------------------|---------|------|------|------|------|------|
| Town                          | 0.008*  | 0.002* | 0.32 | 0.0004* | 0.11 | 0.02* |
| Year                          | 0.003*  | 0.002* | 0.35 | 0.02*  | 0.002* | 0.007* |
| Gender                        | 0.0001* | 0.85  | 0.0001* | 0.0001* | 0.0003* | 0.0004* |
| Preferred fields              | 0.93    | 0.059 | 0.58  | 0.56  | 0.85  | 0.74  |
| Living with parents           | 0.87    | 0.45  | 0.39  | 0.75  | 0.96  | 0.95  |
| Living with flat mates        | 0.45    | 0.053 | 0.52  | 0.15  | 0.69  | 0.55  |
| Transportation                | 0.51    | 0.02* | 0.78  | 0.12  | 0.75  | 0.26  |
| Adequate accommodation for studying | 0.01* | 0.04* | 0.24  | 0.01* | 0.054 | 0.02* |
| Visit frequency               | 0.43    | 0.29  | 0.64  | 0.19  | 0.43  | 0.27  |

*statistically significant difference
Comparative Study of Dental Student Stress in Two European Faculties

of probability corresponded to the 1.6-1.9 range.

Comparing the common stress in Montpellier and Plovdiv, we found it was higher in Plovdiv (1.79 sd=0.81) than in Montpellier (1.63 sd=0.66), (p>0.05). It was statistically higher for females (1.94, sd=0.70) than for males (1.49, sd=0.77), and decreased between 2011 and 2016 (Fig. 1B).

Mean values of the 34 items of stress were also compared within each of the stress factors (Fig. 2). Between 2011 and 2016, it was found that 38% of the stress scores were significantly reduced. Considering the five factors separately, the highest values were found for clinical education (2.42) and the lowest for living conditions (0.96). Fig. 2 shows that in 2011 the distribution of the different stress factors was approximately the same both in Montpellier and Plovdiv. However, in 2016, the mean stress in Plovdiv dental students decreased for all factors, showing a different distribution of the five stress factors between Montpellier and Plovdiv dental faculties.

The results of two-way ANOVA showed a significant overall effect of town (p=0.008), year of study (p=0.003), gender (p=0.0001) and accommodation (p=0.01) on the common mean stress for all students (Table 1).

The mean stress for factors I (living conditions), III (academic work), V (clinical education), were significantly different between the two towns. The mean stress for factors I, III, IV (clinical environment) and V were significantly different between 2011 and 2016. For example, mean stress for factor III (academic work) significantly decreased between 2011 and 2016. There was also a gender effect on the mean stressors for factors II (personal factors), III, IV and V. There were no statistically significant differences in the mean values of five factors concerning students’ preference for dental disciplines. In Plovdiv, however, the students who preferred 'orthodontics' showed higher levels of stress for factors III (academic work) and V (clinical education) than those who did not prefer 'orthodontics'.

Specific Stress Analysis

To better understand the influence of the five stress factors onto the common stress of dental students and their variation over time, we compared the mean scores for the 34 items of the questionnaire per year and per town (Table 2). For all respondents, the highest values were found for Q34 (Examinations): 3.54, and Q52 (Insufficient treatment time): 3.03.

The lowest values were found for Q21 (Difficulties in making friends): 0.56 and Q45 (The teaching and communication language at the faculty): 0.87. Clinical and academic factors were identified as the most important sources of stress in both towns and both years of study. In Montpellier, the highest values were found for Q51 (Completing clinical requirements and quota) in 2011: 3.63, and for Q52 (Insufficient treatment time) in 2011: 3.30. In Plovdiv, the highest values were found for Q34 (Examinations) in 2011: 3.78 and 2016: 3.39. In Montpellier, the lowest values were found for Q14

**Figure 1 A.**

**Figure 1 B.**

**Figure 1.** Common mean stress analysis; (A): Histogram of the mean values of all stress in studied population of both faculties. The histogram was based on the mean stress values of all 34 items of the questionnaire for each student; (B): Comparison of the mean values of stress in studied population. Mean stress values between Plovdiv - Montpellier; male - female and both years of study 2011 – 2016 were compared.
Figure 2. Mean values of the 34 items of stress from both town (Montpellier and Plovdiv) and years (2011 and 2016) and their distribution by the five stress factors.

(Lack of recreation places within the accommodation) in 2011: 0.34 and Q21 (Difficulties in making friends) in 2011: 0.38. In Plovdiv, the lowest values were found for Q21 (Difficulties in making friends) in 2011: 0.57 and 2016: 0.61.

Correlations between different factors of stress and the accommodation and personal factors of students were finally presented: Age was significantly correlated with: the distribution of Q23 (limited holidays during the school year) levels (p=0.04): younger students were more likely to feel stressed about limited holidays during the school year; the distribution of Q27 (self confidence): younger students felt less self-confident and experienced more stress (p=0.04) and the distribution of Q42 (conducive environment for learning) levels (p=0.01): younger students felt more stressed about the clinical environment as a conducive environment for learning (p=0.03). Conversely, senior students experienced higher levels of stress for Q45 (the teaching and communication language at the faculty, p=0.0001), Q46 (discrimination between students, p=0.02) and Q47 (discrimination by sex, religion, origin, color, or race, p=0.0001).

Some items showed more stress in male students than females: ‘self-confidence’ (1.46 vs 0.78, p=0.0001). ‘Teaching and communication language at the faculty’ (1.02 vs 0.72), showed also higher values for boys, but the difference was not significant (p=0.11). Stress from ‘Competition with classmates’ was much higher for girls than for boys (2.18 vs 1.31, p=0.0001). Girls felt more stress about financial support than boys (2.47 vs 1.92), and finally, girls found more difficulties in making friends than boys (0.74 vs 0.36, p=0.004).

DISCUSSION

In this study we compared the results of stress questionnaire between two dental faculties in France and in Bulgaria. The present study compared groups of dental students (2011 and 2016) in their 5th year of study. French and Bulgarian dental students both follow a 6-year curriculum; they were therefore evaluated one year before their graduation. It has been shown that the clinical years of dental education are more stressful than the pre-clinical education and staff creates more stress than the treatment of patients.12,21 We considered that in both countries the 5th year of the dental courses is the most suitable for evaluation of stress levels of dental students, with the highest amount of clinical training followed by a clinical exam. Moreover, the 4th year is the first year of clinical education, and the 6th year is less intensive, so 4th and 6th years appeared to be less adequate for the evaluation of stress.15,22

The common mean stress of dental students in
Table 2. Mean scores and standard deviation for the 34 items of the questionnaire, by town and year

| Item | Montpellier 2011 (sd) | Montpellier 2016 (sd) | Plovdiv 2011 (sd) | Plovdiv 2016 (sd) | Total (sd) |
|------|-----------------------|-----------------------|-------------------|-------------------|------------|
| Q11  | 0.804 (1.067)         | 0.712 (0.941)         | 1.549 (1.165)     | 0.990 (1.203)     | 1.25 (1.17) |
| Q12  | 0.511 (0.688)         | 0.985 (1.285)         | 1.328 (1.229)     | 0.724 (0.961)     | 1.03 (1.14) |
| Q13  | 1.000 (0.873)         | 1.647 (1.169)         | 1.123 (1.250)     | 0.735 (1.163)     | 1.01 (1.21) |
| Q14  | 0.340 (0.668)         | 0.588 (0.885)         | 1.262 (1.504)     | 0.633 (1.039)     | 0.94 (1.22) |
| Q21  | 0.383 (0.668)         | 0.471 (0.762)         | 0.574 (0.978)     | 0.612 (0.938)     | 0.56 (0.88) |
| Q22  | 0.848 (1.115)         | 1.191 (1.200)         | 0.902 (1.222)     | 0.806 (1.198)     | 0.88 (1.20) |
| Q23  | 2.660 (1.464)         | 2.176 (1.506)         | 2.459 (1.570)     | 2.071 (1.438)     | 2.3 (1.51)  |
| Q24  | 1.426 (1.211)         | 1.735 (1.512)         | 2.549 (1.466)     | 2.071 (1.575)     | 2.22 (1.52) |
| Q25  | 0.745 (1.151)         | 0.838 (1.128)         | 1.598 (1.389)     | 1.286 (1.339)     | 1.36 (1.33) |
| Q26  | 1.022 (1.164)         | 1.103 (1.248)         | 1.057 (1.484)     | 0.969 (1.550)     | 1.01 (1.42) |
| Q27  | 1.761 (1.493)         | 1.912 (1.562)         | 1.115 (1.187)     | 1.000 (1.324)     | 1.15 (1.40) |
| Q31  | 2.638 (1.223)         | 2.088 (1.335)         | 1.631 (1.293)     | 1.459 (1.237)     | 1.62 (1.33) |
| Q32  | 1.170 (1.221)         | 1.044 (1.057)         | 1.795 (1.348)     | 1.643 (1.310)     | 1.67 (1.30) |
| Q33  | 1.957 (1.301)         | 1.029 (1.209)         | 1.721 (1.581)     | 1.908 (1.593)     | 1.77 (1.51) |
| Q34  | 3.217 (1.298)         | 2.868 (1.315)         | 3.779 (1.327)     | 3.388 (1.524)     | 3.54 (1.40) |
| Q35  | 1.106 (1.068)         | 1.250 (1.274)         | 2.533 (1.404)     | 2.429 (1.385)     | 2.35 (1.46) |
| Q36  | 2.152 (1.333)         | 1.971 (1.119)         | 2.557 (1.466)     | 2.214 (1.423)     | 2.38 (1.38) |
| Q37  | 1.702 (1.121)         | 1.809 (1.261)         | 1.787 (1.325)     | 1.490 (1.310)     | 1.66 (1.28) |
| Q38  | 1.891 (1.286)         | 1.706 (1.425)         | 2.402 (1.609)     | 2.102 (1.726)     | 2.18 (1.58) |
| Q41  | 2.298 (1.443)         | 2.118 (1.276)         | 2.689 (1.494)     | 2.122 (1.575)     | 2.41 (1.48) |
| Q42  | 3.283 (1.501)         | 2.897 (1.135)         | 1.730 (1.336)     | 1.449 (1.211)     | 1.81 (1.46) |
| Q43  | 1.894 (1.323)         | 2.118 (1.216)         | 1.926 (1.331)     | 1.602 (1.274)     | 1.83 (1.29) |
| Q44  | 1.196 (1.439)         | 1.309 (1.136)         | 1.344 (1.316)     | 1.020 (1.084)     | 1.22 (1.34) |
| Q45  | 0.404 (0.825)         | 0.701 (1.128)         | 1.000 (1.324)     | 0.816 (1.170)     | 0.87 (1.19) |
| Q46  | 2.064 (1.480)         | 1.015 (1.178)         | 1.500 (1.570)     | 0.949 (1.222)     | 1.27 (1.43) |
| Q47  | 0.574 (0.994)         | 0.603 (1.161)         | 1.172 (1.458)     | 0.959 (1.354)     | 1.02 (1.33) |
| Q48  | 1.404 (1.116)         | 1.403 (1.349)         | 3.057 (1.490)     | 2.449 (1.574)     | 2.63 (1.59) |
| Q49  | 1.805 (1.188)         | 1.448 (1.105)         | 1.738 (1.341)     | 1.582 (1.392)     | 1.65 (1.29) |
| Q51  | 3.630 (1.323)         | 2.853 (1.162)         | 3.197 (1.709)     | 2.571 (1.741)     | 2.98 (1.59) |
| Q52  | 3.304 (1.489)         | 3.088 (1.231)         | 3.083 (1.599)     | 2.857 (1.573)     | 3.03 (1.49) |
| Q53  | 2.234 (1.237)         | 2.382 (1.159)         | 2.762 (1.559)     | 2.663 (1.566)     | 2.69 (1.44) |
| Q54  | 1.783 (1.172)         | 1.574 (1.041)         | 2.426 (1.537)     | 1.929 (1.286)     | 2.16 (1.36) |
| Q55  | 2.065 (1.162)         | 2.015 (1.321)         | 2.107 (1.335)     | 1.918 (1.345)     | 2.02 (1.30) |
| Q56  | 1.362 (1.150)         | 1.441 (1.042)         | 2.303 (1.335)     | 1.439 (1.317)     | 1.85 (1.31) |
our study was equal to 1.74 (level 2 on the Likert scale). This finding is consistent with the results of other studies. The observed stress level in the study was in wide range. The mean values for the five factors were 0.96, 1.36, 2.08, 1.62 and 2.42, respectively. In a similar study, Al-Omari et al. found: 1.65, 2.02, 1.94, 1.93, and 2.10, which are higher levels, except for factor V (1.94, clinical education).

There was no relation between the most preferred disciplines and the perceived level of stress. In Plovdiv, the students who preferred ‘orthodontics’ (about 10% of them) seemed to perceive more stress for clinical work and education (factors III and V). This result was not observed in Montpellier.

Females were significantly more stressed than males, and the junior students more stressed than the senior ones, which is in agreement with the findings of other studies. This result was not changed in 2011 and 2016 in both faculties.

Globally, the mean stress levels between 2011 and 2016 decreased, the decreasing tendency being more pronounced in the Plovdiv Dental Faculty (Fig. 2). The trend of the stress factors related to accommodation (living conditions and personal factors) between the two years of observation, demonstrated a great difference between Plovdiv and Montpellier dental students. In Montpellier, living conditions and personal factors of stress decreased, while all other factors increased between 2011 and 2016. In Plovdiv all factors of stress decreased.

The percentage of students living with their parents in Montpellier was lower than in Plovdiv, and the French students were less stressed. A possible explanation could be that the French dental students think the living conditions out of the family house for less stressful and more suitable to studying.

Academic work and clinical environment were more stressful factors for dental students. This result was repeated in 2011 and in 2016. Factors like ‘examinations’ and ‘compliance of patients’ showed the highest scores for stress, which is in accordance with most studies. The score for ‘Examinations’ in Montpellier was 3.0 (1.31) and in Plovdiv: 3.6 (1.43); compared to 3.29 in Jordanian in 2005. However, stress from ‘Examinations’ did significantly decrease between 2011 and 2016 in both towns, while the stress from ‘compliance of patients’ significantly decreased only in Plovdiv.

The difference in the stress level for clinical work between Plovdiv and Montpellier could be explained with the different clinical organization in both faculties. In Montpellier, the work in clinics is organized on box system and hospital principle. More precisely all students’ work takes place in separated boxes leading to a large common room. Assistant professors from different specialties supervise the students and help in case of difficulties. In Plovdiv dental faculty, the students are grouped in small groups. One students’ group works in a smaller room comprising 8 dental units. One assistant professor from one dental specialty supervise the work in the group. The different dental specialties were separated on different floors of the building. In both faculties the students have no dental assistant during their work.

There was a reorganization in clinical work in Montpellier between 2011 and 2016. A binomial principle of work and quotation of dental students was introduced. A senior student works together with a junior one for the same patient’s treatment. The supervisor intervenes in case of greater difficulty. These facts could be an explanation for statistically significant decrease in Montpellier for three stress factors: ‘compliance of patients’, ‘completing clinical requirements and quota’ and ‘insufficient treatment time’ (Table 2).

Significant correlations were found between ‘uncertainties about the field of study as a future career’, ‘transition from preclinical to clinical year’, ‘confidence in own clinical decision’ and ‘communication with patients’. The predominance of these stress factors in 2011 in a Plovdiv Dental Faculty was already described, the same tendency persisting in 2016. Age was also related with some stressors. It seems that fifth year students, who were older, had more capability in stress management.

To reduce the stress level of academic work and the clinical education of dental students could be an important point to improve the efficacy and the quality of the student work. The stress management programs reported in the literature for dental students were limited, and included self-hypnosis, meditation, mindfulness-based stress reduction, changes in the ‘pass/fail’ grading system, feedback on various health habits, educational discussion, and changes in the length and type of curriculum provided.

Alternative methods of education and examination such as interactive methods, could be considered in order to reduce the stress during theoretical exams. These methods would probably not replace the classical methods in which the presence of the student is needed, but they could be a part of the whole
student program. The distance education and examination could be realized by means of the internet platform inside the dental faculties. The students could follow the lectures or the exams, staying at home facing their computer, which could be as effective and less stressful for the student.

To reduce the clinical stress of dental students a regular discussions and debriefs concerning the clinical cases could be introduced. All the students could be involved in these discussions, together with their supervisors from different specialties. That approach would help resolving difficult clinical cases, in order to improve the patients’ follow up and to reduce the stress in taking the clinical decisions.

Role games based on different clinical situations could be another pedagogical approach introduced in the pre-clinical stage of dental education. In these games the student could take the role of the patient, of the dental practitioner or the dental assistant. The games might be video recorded and discussed afterwards.

CONCLUSIONS

In this study we highlighted different groups of factors that could influence the perceived stress among dental students. Factors related to living conditions and the studying environment caused the main difference between Montpellier and Plovdiv students. Academic work and clinical education are prevailing factors of stress during education. The challenge for decreasing student’s stress is how to minimize the influence of both, without altering the quality of dental education. Simple methods like binomial principle of studying, combining students of different ages, both sex or different towns could reduce the stress levels. The interactive methods like distance education and examination, preclinical role games could make the education more attractive and decrease the students stress.

REFERENCES

1. Alzahem AM, van der Molen HT, Alaujan AH, et al. Stress amongst dental students: a systematic review. Eur J Dent Educ 2011;15(1):8-18.
2. Manolova MS, Manchorova NA, Manolova MS, Stefanova VP, Keskinova D, & Panayotov IV. Stress Impact on Dental Medicine Students Psychological Health. Dental Magazine 2015;3:46-8.
3. Anushri M, Yashoda R Puranik MP. Relationship between psychological well-being and perceptions of stress among undergraduate dental students in Bengaluru city: A cross-sectional study. J Indian Assoc Public Health Dent 2014;12(4):283-92.
4. Krohne, H.W. Stress and Coping Theories. Johannes Gutenberg-Universitat Mainz Germany 2002.
5. Lazarus, R. S. Psychological stress and the coping process. New York: McGraw-Hill 1966.
6. Lazarus R.S. Emotion and adaption. Oxford: Oxford University Press 1991.
7. Phillips A.C. Perceived Stress. In: Gellman M.D., Turner J.R. (eds) Encyclopedia of Behavioral Medicine 2013. Springer, New York, NY
8. Manolova MS, Manchorova NA, Markova KB, et al. Stress and dental education. Dental Magazine 2015;3:42-5.
9. Pohlmann K, Jonas I, Ruf S, et al. Stress, burnout and health in the clinical period of dental education. Eur J Dent Educ 2005;9(2):78-84.
10. Brondani MA, Ramanula D, Pattanaporn K. Tackling stress management, addiction, and suicide prevention in a predoctoral dental curriculum. J Dent Educ 2014;78(9):1286-93.
11. Dahan H, Bedos C. A typology of dental students according to their experience of stress: a qualitative study. J Dent Educ 2010;74(2):95-103.
12. AboaIsham 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(1):75-81.
13. Humphris G, Blinkhorn A, Freeman R, et al. Psychological stress in undergraduate dental students: baseline results from seven European dental schools. Eur J Dent Educ 2002;6(1):22-9.
14. Gorter R, Freeman R, Hammen S, et al. 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.
15. Al-Omari WM. Perceived sources of stress within a dental educational environment. J Contemp Dent Pract 2005;6(4):64-74.
16. Kumar S, Dagli RJ, Mathur A, et al. Perceived sources of stress amongst Indian dental students. Eur J Dent Educ 2009;13(1):39-45.
17. Polychloronpopoulou A, Divaris K. Dental students’ perceived sources of stress: a multi-country study. J Dent Educ 2009;73(5):631-39.
18. Langoski JÉ, Klipan LB, Bordin D, et al. Stress among Brazilian dental students in different periods: prevalence and perceptions. Psychology 2015;6(3):297-304.
19. Manolova MS, Stefanova VP, Panayotov IV, et al. Perceived sources of stress in fifth year dental students-- a comparative study. Folia Med 2012;54(2):52-9.
20. Manolova MS, Stefanova VP, Panayotov IV, et al.
21. Shiralkar MT, Harris TB, Eddins-Folensbee FF, et al. A systematic review of stress-management programs for medical students. Acad Psychiatry 2013;37(3):158-64.
22. Alzahem AM, van der Molen HT, Alaujan AH, et al. Stress management in dental students: a systematic review. Adv Med Educ Pract 2014;5:167-76.
23. Sedky NA. Perceived sources of stress among junior & mid-senior Egyptian dental students. Int J Health Sci (Qassim) 2012;6(2):141-57.
24. Elani HW, Allison PJ, Kumar RA, et al. A systematic review of stress in dental students. J Dent Educ 2014;78(2):226-42.
25. Polychronopoulou A, Divaris K. A longitudinal study of Greek dental students’ perceived sources of stress. J Dent Educ 2010;74(5):524-30.

Пятилетнее сравнительное исследование воспринимаемого стресса среди студентов-стomatологов двух европейских факультетов

Мария С. Манолова1, Весела П. Стефанова1, Нешка А. Манчорова-Велева1, Иван В. Панайотов2,4, Бернар Левалоа 2,4, Пол Трамини5,6, Валери Орти3,4
1 Кафедра оперативного зуболечения и эндодонтии, Факультет дентальной медицины, Медицинский университет - Пловдив, Пловдив, Болгария
2 Кафедра консервативного зуболечения и эндодонтии, Факультет дентальной медицины, Медицинский университет Пловдив, Пловдив, Болгария
3 Кафедра пародонтологии, Факультет дентальной медицины, Университет Монпелье, Монпелье, Франция
4 Лаборатория биомеханики и нанонаук, Университет Монпелье, Монпелье, Франция
5 Кафедра общественного дентального здравоохранения, Факультет дентальной медицины, Университет Монпелье, Монпелье, Франция
6 Лаборатория эпидемиологии и биостатистики, Университет Монпелье, Монпелье, Франция

Адрес для корреспонденции: Мария С. Манолова, Кафедра оперативного зуболечения и эндодонтии, Факультет дентальной медицины, Медицинский университет - Пловдив, Пловдив, Болгария
E-mail: mimaci@yahoo.com
Tel: +359887322776

Дата получения: 29 марта 2018
Дата приемки: 30 августа 2018
Дата онлайн публикации: 10 сентября 2018
Дата публикации: 31 марта 2019

Ключевые слова: dental students, stress sources, stress level, education

Образец цитирования: Manolova MS, Stefanova VP, Manchorova-Veleva NA, Levalois B, Panayotov IV, Tramini P, Orti V. A five-year comparative study of perceived stress among dental students at two European faculties. Folia Med (Plovdiv) 2019;61(1): doi: 10.2478/folmed-2018-0052

Цель: Сравнить уровни, причины и влияние стресса в группах студентов-стоматологов с пятого курса обучения на факультетах стоматологии в Пловдиве, Болгария, и Монпелье, Франция.

Материалы и методы: Анкета, которую мы использовали, представляет собой модифицированный вариант анкеты Dental Environment Stress (DES) с 56 вопросами. В опросе приняли участие студенты-стоматологи пятого курса обоих факультетов в 2011 и 2016 годах - всего 335 студентов по стоматологии. Пятитабличная шкала Лайкерта использовалась для учёта ответов участников. Статистический анализ проводили с использованием специализированного программного обеспечения STATA версии 14.1 (StataCorp, College Station, США).

Результаты: Средний возраст исследуемой популяции не был статистически значимым между 2011 и 2016 годами (p = 0,08). Средний показатель стресса студентов составил 1,74 (CI: 1,64, 1,84, диапазон: 0,12, 4,50). В Пловдиве он был выше (1,79 ± 0,81), чем в Монпелье (1,63 ± 0,66); был статистически выше среди девушек (1,94 ± 0,70) по сравнению с показателем среди молодых людей (1,49 ± 0,77), и снизился в период между 2011 и 2016 годами. На значительный общий эффект общего среднего стресса оказал влияние город (p = 0,008), курс (p = 0,003), пол (p = 0,0001) и среда обитания (p = 0,01) учащегося.

Выводы: Академические круги и клинические факторы стресса являются преобладающими стрессорами во время обучения. В настоящее время задача состоит в том, чтобы уменьшить воздействие обоих факторов без изменения качества образования по дентальной медицине, регулярно проводить обсуждения и дискуссии по клиническим случаям до и после клинической деятельности, обсудить использование альтернативных методов обучения и тестирования в качестве интерактивных методов для снижения стресса при теоретических экзаменах.