

## Perceived Sources of Stress and Stress Coping Strategies among Junior Dental Students at Ajman University

Sundus A. A. Al Omar<sup>1\*</sup>, Al-Moutassem Billah Khair<sup>2</sup>, Nisha Shantakumari<sup>3</sup>,  
Mawada Abdelmagied<sup>4</sup>, Karrar M. H. Hadi<sup>4</sup>

1. Assistant Professor in the Unit of Basic and Medical Sciences, College of Dentistry, Ajman University, UAE.
2. Assistant Professor and Head of the Unit of Basic and Medical Sciences, College of Dentistry, Ajman University UAE.
3. Adjunct faculty at the Unit of Basic and Medical Sciences, College of Dentistry, Ajman University, UAE.
4. Teaching Assistant and Dental GP at College of Dentistry, Ajman University, UAE.

### Abstract

The aim of our study was to evaluate the sources of stress among junior students in the dental college, their perceived levels of stress and coping strategies they adopt.

This study was conducted during the fall semester of academic year 2018-2019 at the College of Dentistry at Ajman University, United Arab Emirates. 227 students answered a self-administered set of validated questionnaires, including Modified Dental Environment Stress (DES) questionnaire, Perceived Stress Scale (PSS) and COPE inventory.

The study showed that junior dental students of Ajman University, perceived stress across the two junior years and females perceived more stress than males. The factors of "study load" and "examinations" were identified among the main sources of stress. Coping strategies adopted by the students showed gender differences in the coping methods used. The regression analysis showed that the active coping and suppression of competing activities had a strong negative correlation to the PSS scores. The factors "focus on" and the "venting of emotions" however, had positive association with perceived stress scores.

Junior dental students at Ajman University displayed relatively high-perceived stress scores. The study load and examinations were identified among the main source of stress. Incorporating stress management methods and implementing new pedagogical tools is necessary to reduce the level of stress in dental education.

**Clinical article (J Int Dent Med Res 2020; 13(1): 306-314)**

**Keywords:** Dental students, Stress, Coping strategies, UAE.

**Received date:** 10 July 2019

**Accept date:** 19 November 2019

### Introduction

Stress was defined by Lazarus and Folkman as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his resources and endangering his wellbeing".<sup>1</sup> Therefore the term "stress" describes external demands (physical or mental) on an individual's physical and psychological wellbeing.<sup>2</sup>

High prevalence of stress was reported among dental students worldwide.<sup>2-10</sup>

The stressors reported varied primarily in relation to culture, ethnicity, geographical and

educational background.<sup>11,12</sup> In addition, stress may have a negative impact on the students' mental and physical health and affect his learning ability.<sup>13</sup> Coping strategies are specific behavioral and psychological efforts that individuals employ to tolerate and reduce stressful events.<sup>12,13</sup> Ethnic, cultural, and socioeconomic characteristics influence the approaches in coping.<sup>12,14</sup>

Identifying the common stressors, stress levels and the coping strategies, would help educators to implement effective student support services to provide a healthy learning environment.

Good number of studies on stress among dental students were done in the Middle East.<sup>9,12,15-19</sup> However, from United Arab Emirates, there is only one study which investigated the stressors and coping strategies adopted by a limited sample of junior students of various health professions colleges.<sup>12</sup>

#### \*Corresponding author:

Dr. Sundus A. Al Omar,  
Unit of Basic and Medical Sciences, College of Dentistry,  
Ajman University, Ajman, UAE, PO Box 346,  
E-mail: s.abdulwahhab@ajman.ac.ae

With all the above points in view, the objectives of this study were to identify common stressors, perceived level of stress and the coping strategies adopted by our dental students. Another aim was to study the effect of year of study and gender on those parameters.

## Materials and methods

This is a cross-sectional study, which was conducted during the fall semester of academic year 2018-2019 at the College of Dentistry, Ajman University, Ajman, United Arab Emirates. The study was initiated after obtaining approval from the Research and Ethical committee of the University. All the participants were briefed on the objectives of the study and an informed consent was obtained from each student before enrollment in the study.

### Participants

The study population included all the junior students in the first and second year at the College of Dentistry in Ajman University during the fall semester of the academic year 2018-2019.

Exclusion criteria included:

1. Students who are older than twenty-one years.
2. Married students.
3. Any student who was diagnosed to have any psychological disorders and on any medication for such illness.

All 380 junior dental students including (first and second year) were invited during their regular classes, 227 answered the questionnaire.

### Study instrument

The self-administered questionnaire used in the study consisted of four measures: Demographic details, Modified Dental Environment Stress (DES) questionnaire, Perceived Stress Scale (PSS), and COPE inventory.

**Modified DES:** The original DES is well known validated tool that is used all over the world.<sup>20</sup> Many studies employed the modified version of the tool.<sup>16,21</sup> A modified DES version was also used in this study. All the items in the DES related to clinical exposure were dropped from

the questionnaire because the population is in the preclinical years. The final modified version was containing thirty stress-related items was used in the survey. Students were asked to respond to the questionnaire items (on a four-point Likert scale) as "not stressful at all", "somewhat stressful", "quite stressful", or "very stressful".

**Perceived Stress Scale (PSS):** The PSS is a Ten-item scale used to measure the degree of stress perception.<sup>22</sup> The students were asked to indicate the frequency of certain items and thoughts during the past one month by choosing: 0 = Never, 1 = Almost never, 2 = Sometimes, 3 = Fairly often and 4 = Very often.

The PSS scores of four positively stated items were computed by reversing responses (i.e., 0 = 4, 1 = 3, 2 = 2, 3 = 1 and 4 = 0). The reverse-coded items were finally summated to the remaining scale items to achieve the assessment score.

**COPE inventory:** This sixty-item tool is employed to evaluate the coping strategies adopted in response to stress.<sup>23,24</sup> The choices in the four-point Likert-type scale ranged from: 1. "I have not been doing this at all" to 4: "I've been doing this a lot". The items in the scale could be summed up into fifteen scales: positive reinterpretation and growth, mental disengagement, focus on and venting of emotions, use of instrumental social support, active coping, denial, religious coping, humor, behavioral disengagement, restraint, use of emotional social support, substance abuse, acceptance, suppression of competing activities and planning.

### Statistical analysis

This study was a descriptive cross sectional involved a close-ended questionnaire, which initially validated using factor analysis. The data collected was entered and analysed using software IBM SPSS statistics version 20. The collected data were organized as descriptive results, and they included the student's age, gender and year of study; then they were analysed and tabulated as frequency and percentage distribution. The mean score and SD for each of the measures under research were tabulated. Statistical analysis was done after dividing the questionnaire into three categories:

thirty stress related items, ten-item PSS (along with reversal of coding to the four positively stated items of 4, 5, 7 and 8) and sixty items for coping strategies.

Internal reliability of all three tools of the questionnaire was assessed by calculating Cronbach's alpha.

The Mann-Whitney test was employed to determine significant differences between first and second year students.

Differences between individual years were assessed using a pairwise comparison test. Pearson's correlation and beta coefficient were calculated to compare the strength of the effect of coping strategies in relation to the perceived stress scale scores.

The statistical significance (p-Value) was set at below 0.05 (95% confidence interval).

## Results

### Demographic characteristics of the participants:

All (380) junior dental students were invited and 227 were finally enrolled in the study (59.7 %). The demographic characteristics of the participants were as follows; the participants were 93 males (41%) and 134 females (59%) . 117 of the participants were first year students (51.5%), and 110 were second year students (48.5%).

### Reliability of the questionnaires:

Internal reliability of all three tools of the questionnaire (30 Items stressors, 10 Items PSS, and 60 Items coping strategies) was assessed by calculating Cronbach's alpha. The three tools were reliable as the alpha coefficients were 0.874-0.876, 0.790-0.793, and 0.829-0.831 respectively.

### Determination of the different stress-associated factors:

The most common stressors as identified by the majority of the participants regardless of gender or year of study were as follows:

"Study load" was the highest stress-related factor as identified by 64.8% of the participants with the mean score of 3.53. Next was the factor of "fear of not being able to catch up if falling behind" (60.4%) and "examinations" (59.5%) with the mean score of 3.38 and 3.45 respectively. On the other hand, the least identified as source of stress were the factors "dependencies" 8.4% (mean = 1.78) and "making friends", 8.8% (mean

= 1.55). (Table 1)

### Perception of stress:

The mean PSS score for the study population was 2.33 ( $\pm 0.62$ ) and the median was 2.3. Among the years of study, first year students had the highest score (2.41) compared to the second year students (2.23) but it was not a statistically significant difference. However, gender distribution showed significant association with PSS ( $p < 0.010$ ) by univariate analysis in which female students perceived stress significantly more than male students. (Table 2)

### Coping Strategies:

In this study, we investigated the coping strategies used by our junior students to deal with the stress. A sixty-item brief coping strategies tool was grouped into 15 domains with no reversal of coding. The results of analysis of this tool are shown in Table 3.

Among all coping strategies, religious coping (mean = 3.46) and positive reinterpretation and growth (mean = 3.12) were found to be used by most of the students, whereas denial (mean = 1.91) and behavioral disengagement (mean = 1.85) were least used among dental students.

Stress coping strategies revealed significant differences between first year and second year students, in particular, the coping mechanism of mental disengagement ( $p < 0.014$ ).

First year students used mental disengagement (mean = 2.67) more than second year students (mean = 2.61).

Gender wise, when the stress coping strategies were compared between males and females revealed significant differences. The religious coping was higher in the female students (3.56) versus (3.33) in male students ( $p < 0.000$ ). While, the mean score of Humor ( $p < 0.003$ ), substance use ( $p < 0.001$ ) and acceptance ( $p < 0.004$ ) were all higher in males (mean score of 2.59, 1.55 and 3.04), compared to the mean score of the female (mean score of 2.16, 1.26 and 2.91), respectively.

### Correlation between coping strategies and PSS:

Pearson's correlation analysis was used to study the correlation between coping strategies and PSS scores. Among coping strategies, there was strong positive correlation between mental disengagement and humor (0.133) along with behavioral disengagement (0.146). It was found that in a stepwise approach, eight out of fifteen

coping strategies were statistically significant and independently related to PSS scores ( $p < 0.05$ ). (Table 4)

In the Stata regression analysis, coping strategies were used as coefficients of independent variables (betas) and the constant (alpha) was values of PSS. The prediction equation showed strong association between each independent variable and dependent variable. Because these correlation coefficients are statistically significant, the multiple regression analysis was carried out to assess determinants of coping strategies, which is independently related to perceived stress scores. The active coping (-0.203) and suppression of competing activities (-0.154) of the stress coping strategies showed a strong negative correlation related to the PSS scores. The factor 'focus on and venting of emotions' (0.229) however, had positive association with perceived stress scores (Table 5).

## Discussion

Stress is a normal physiological reaction that can stimulate and motivate the students to perform at their best effort.<sup>18,20</sup> However; stress can hinder the learning process of students and reduce their effectiveness.<sup>17</sup>

Dental schools are known to be highly demanding and stressful learning environment.<sup>21</sup> To become a responsible dental professional, students have to reach high levels of knowledge and professional skill, as well as developing good attitudes towards the patient care all within few years. The junior students in the first few months of their program face more stress as they struggle to understand the new environment and the new methods of teaching.

Over the past several years, dental educators have given increasing attention to investigating stress among dental students within the academic environment. Many authors have attempted to identify the factors that are perceived as stressful in both undergraduate and postgraduate dental students.<sup>8,21,25</sup> Several studies have reported that dental education is considered stressful to students.<sup>21</sup> The results of these studies were similar among different countries with different educational curricula.<sup>8</sup> Parameters including stress scales, changes in blood pressure and cortisol levels, have been used to assess the level of stress in the dental

student population.<sup>26,27</sup>

In our study, 227 junior students (59% female and 41% male) answered a set of questionnaire with a response rate of 59.7% of the total number of first year and second year students. The questionnaire included; Modified Dental Environment Stress (DES) questionnaire, Perceived Stress Scale (PSS) and COPE inventory. Analysis of the response showed that all junior dental students of Ajman University perceive stress regardless of gender or the year of study, which is in line with all other studies done before. Moreover, when the results were analyzed for gender difference we found that female students were perceiving more stress than male students were ( $P < 0.01$ ). This result is in agreement with most of other similar studies.<sup>10,17,19,21</sup> On the other hand, others like Tangade et al, in a study done in India, found that male students perceived more stress than females.<sup>23</sup> Such controversy between the results can be explained on the basis of different cultures, which affect the stress perception of students.<sup>12,23</sup>

In Dental Colleges, the sources of stress are wide variety of factors. It has been shown that different stressors are to blame at different levels of dental school.<sup>21,25</sup> In a meta-analysis and review of 214 studies, Elani et al found that the main sources of stress for dental students included examinations, grades, and workload.<sup>8</sup> This was among all levels (preclinical and clinical). In our study we found also that the majority of the participants identified the study load, fear of not being able to catch up if falling behind and the examinations as the main stress-related factors. These findings are in line with other studies done all over the world all of which agree that the study (work) load and examinations are the major causes of stress among dental students regardless of the gender and year of study.<sup>8,15,16,18</sup>

The coping strategies for stress management may play a relevant role in academic performance and success. Promoting the use of adequate coping strategies, such as problem-solving focused coping, positive reappraisal, and looking for social support, could have a positive impact on student performance and scores. On the other hand coping strategies with negative emotions can lead to poor performance, illness and substance abuse.<sup>14</sup> Grego et al stated that understanding stress and

the use of coping strategies, could have an impact not only on dental students' self-efficacy but also on their grades.<sup>28</sup>

Coping strategies also differ in different countries and cultures. Aldwin reported that culture not only could affect the perception of stress but also the coping process in many ways.<sup>11</sup>

In our study, first year students adopted mental disengagement more than second year students and this might explain why they perceived more stress. It has been reported that individuals using disengagement coping are not able to deal with the stressor and hence are more likely to experience the negative consequences of the stressor.<sup>29, 30</sup>

In addition, there was gender difference in the coping strategies adopted by students. Female students seem to prefer the religious coping, while male students adopted humor, substance use and acceptance. Waithaka & Gough studied the influence of religion on stress coping of college students, they found that students with religious commitment would have higher life satisfaction and perceive less stress.<sup>31</sup> They also found that female college students scored higher on religious coping than male college students, which is similar to our findings. Although our female students perceived more stress than male students did, we found that they scored higher marks in the exams than male students. This could mean that their stress-coping methods were effective.

In our study also, the strategies of active coping and suppression of competing activities showed a strong negative correlation related to the PSS scores. On the other hand, the method of Focus on and venting of emotions showed strong positive correlation to the PPS scores. Most of these findings agree with other similar studies that investigated the stress coping methods among dental students.<sup>16</sup>

The coping strategies (active coping and suppression of competing activities) showed a strong negative correlation related to the PSS scores. Other researchers had shown that such correlation indicates that the use of such coping strategies has been effective in lowering the stress.<sup>29</sup> Whilst focus on and venting of emotions showing strong positive correlation to the PSS scores, indicating that this coping measure was not effective in dealing with stress.<sup>32</sup> Students who report using these coping strategies were

more likely to have higher perceived stress levels.<sup>33</sup> Therefore, guiding students to adopt the appropriate coping strategies is hence of utmost important to help reduce student stress levels and improve their academic performance.

## Conclusions

Junior dental students at Ajman University displayed stress regardless of gender or year of study. The female students perceived more stress than male students did.

The students identified study load and examinations among the main sources of stress. There were also gender-related differences in stress-coping methods. This study is adding another brick in the wall of evidence that Dental students perceive stress. Therefore, there is a real need for incorporating stress management strategies and guiding dental students to adopt the appropriate coping strategies. Such measures would help to reduce the level of stress in dental education, improve their academic performance and increase the effectiveness of the program.

## Acknowledgements

The authors acknowledge the Dental students of Ajman University for answering the questionnaire.

## Declaration of Interest

The authors report no conflict of interest and the article is not funded or supported by any research grant.

Stressor	Mean score	Std. Deviation	% of students naming stressor
Amount of study load	3.5291	0.74604	64.8%
Fear of not being able to catch up if falling behind	3.3833	0.88662	60.4%
Examinations	3.4509	0.77939	59.5%
Having a lecture or laboratory session immediately before an exam	3.2863	0.91784	55.9%
Fear of failure	3.1894	1.0063	53.3%
Crowded time table	3.0487	0.92967	38.8%
Lack of time for personal life	3.0398	0.9396	37.9%
Feeling that success is determined by factors not in your control	2.854	1.03748	34.4%
Financial issues	2.7168	1.08705	31.3%
Difficulty of course work	3.022	0.80069	29.5%
Expectations versus reality of dental schools	2.5157	1.03909	21.6%
Uncertainty about dental career	2.4735	1.05902	21.6%
Inadequate breaks	2.3451	1.04792	18.5%
Competition between classmates	2.2756	1.07926	18.1%
Treated as immature and irresponsible	2.2691	1.10253	17.6%
Criticism about academic work	2.4286	1.02186	17.2%
Environment in which to study	2.3965	0.96468	15.9%
Lack of effective lectures/teaching	2.2743	0.99553	14.5%
Spacing of continuous assessment throughout the year	2.3527	0.94972	13.2%
Approachability of staff	2.1935	0.97152	12.8%
Moving away from home	2.115	1.03066	12.8%
Health issues	2.0223	1.05645	12.3%
Amount of cheating in dental school	2.0711	1.02831	11.9%
Lack of student input in faculty decision making	2.2851	0.96068	10.6%
Lack of faculty administrative response to my needs	2.2844	0.90582	8.8%
Making Friends	1.7832	0.97154	8.8%
Dependencies (smoking or medications)	1.5536	0.95963	8.4%
Other problems with accommodation	2.0905	0.93466	7.9%
Rules and regulations of dental school	2.1013	0.92332	7.0%
Discrimination on basis of nationality or social class	1.6244	0.9041	6.2%

**Table 1.** Mean score of different stress-associated factors and Percentage of students who identifying the stressor.

	Mean (SD)	Median	p-Value
Male	2.26(0.69)	2.3	0.010*
Female	2.37(0.56)	2.4	
First Year Students	2.41(0.59)	2.5	0.373
Second Year Students	2.23(0.64)	2.2	
Overall	2.33(0.62)	2.3	

**Table 2.** Comparison of Mean Scores of Perceived Stress Scale between Males and Females and between year 1 and year 2 dental students.

\* indicates statistically significant p-Value.

Coping strategies	Male Mean (SD)	Female Mean (SD)	p-Value	First Year Mean (SD)	Second Year Mean (SD)	p-Value	Overall Mean (SD)
Positive reinterpretation and growth	3.19 (0.60)	3.08 (0.62)	0.714	3.09 (0.57)	3.16 (0.65)	0.111	3.12 (0.61)
Mental disengagement	2.59 (0.70)	2.68 (0.59)	0.348	2.67 (0.68)	2.61 (0.59)	0.014*	2.64 (0.64)
Focus on and venting of emotions	2.37 (0.79)	2.75 (0.72)	0.955	2.57 (0.77)	2.61 (0.78)	0.498	2.60 (0.77)
Use of instrumental social support	2.77 (0.74)	2.64 (0.81)	0.294	2.69 (0.74)	2.70 (0.83)	0.262	2.69 (0.78)
Active coping	2.84 (0.65)	2.72 (0.57)	0.475	2.71 (0.60)	2.82 (0.61)	0.604	2.77 (0.61)
Denial	2.01 (0.86)	1.84 (0.67)	0.250	1.85 (0.65)	1.97 (0.86)	0.073	1.91 (0.76)
Religious coping	3.33 (0.74)	3.56 (0.42)	0.000*	3.45 (0.56)	3.47 (0.62)	0.809	3.46 (0.59)
Humor	2.59 (1.08)	2.16 (0.80)	0.003*	2.19 (0.85)	2.48 (1.03)	0.401	2.33 (0.95)
Behavioural disengagement	1.89 (0.62)	1.82 (0.60)	0.729	1.77 (0.62)	1.93 (0.58)	0.165	1.85 (0.61)
Restraint	2.81 (0.65)	2.54 (0.65)	0.522	2.56 (0.66)	2.76 (0.64)	0.187	2.65 (0.66)
Use of emotional social support	2.62 (0.90)	2.43 (0.82)	0.126	2.51 (0.80)	2.50 (0.92)	0.096	2.51 (0.86)
Substance use	1.55 (0.80)	1.26 (0.63)	0.001*	1.32 (0.66)	1.44 (0.77)	0.123	1.38 (0.72)
Acceptance	3.04 (0.75)	2.91 (0.59)	0.004*	2.85 (0.66)	3.08 (0.64)	0.571	2.96 (0.66)
Suppression of competing activities	2.81 (0.81)	2.66 (0.59)	0.098	2.60 (0.56)	2.84 (0.79)	0.282	2.72 (0.69)
Planning	3.12 (0.65)	2.88 (0.59)	0.469	2.88 (0.59)	3.09 (0.64)	0.407	2.98 (0.63)

**Table 3.** Comparison of Mean Scores of Mean Scores of Coping Strategies between Males and Females and between year 1 and year 2 dental students.

\* indicates statistically significant p-Value.

Coping strategies:	PSS Score	p-Value
Positive reinterpretation and growth	-0.072	0.280
Mental disengagement	0.221	0.001*
Focus on and venting of emotions	0.342	0.000*
Use of instrumental social support	-0.001	0.988
Active coping	-0.114	0.030*
Denial	0.292	0.000*
Religious coping	-0.025	0.713
Humor	0.202	0.002*
Behavioural disengagement	0.256	0.000*
Restraint	0.178	0.007*
Use of emotional social support	0.120	0.071
Substance use	0.134	0.043*
Acceptance	0.001	0.641
Suppression of competing activities	-0.068	0.308
Planning	-0.002	0.971

**Table 4:** Correlation of PSS with the categories of Coping Strategies.

\* indicates statistically significant p-Value.

Coping strategies	$\beta$ -Coefficient	t-Value	p-Value
Constant	0.546	1.60	0.109
Positive reinterpretation and growth	-0.120	-1.67	0.096
Mental disengagement	0.099	1.79	0.075
Focus on and venting of emotions	0.229	4.47	0.000*
Use of instrumental social support	-0.075	-1.30	0.195
Active coping	-0.203	-3.14	0.002*
Denial	0.056	1.04	0.298
Religious coping	0.006	0.09	0.927
Humor	0.104	2.58	0.011*
Behavioural disengagement	0.049	0.74	0.460
Restraint	0.113	1.95	0.053
Use of emotional social support	0.028	0.54	0.587
Substance use	-0.074	-1.42	0.155
Acceptance	0.039	0.66	0.509
Suppression of competing activities	-0.154	-2.65	0.009*
Planning	0.092	1.31	0.193

**Table 5:** Regression coefficient of PSS with the categories of Coping Strategies.

\* indicates statistically significant p-Value.

## References

- Lazarus RS, Folkman S. Stress, Appraisal and Coping. New York: Springer; 1984. Available at: [https://books.google.ae/books?hl=en&lr=&id=iySQQuUpr8C&oi=fnd&pg=PR5&ots=DfINivijPh&sig=fg0cym05XetrVxOwoQ-06Ye-BRQ&redir\\_esc=y#v=onepage&q&f=false](https://books.google.ae/books?hl=en&lr=&id=iySQQuUpr8C&oi=fnd&pg=PR5&ots=DfINivijPh&sig=fg0cym05XetrVxOwoQ-06Ye-BRQ&redir_esc=y#v=onepage&q&f=false)
- Atkinson JM, Millar K, Kay EJ, Blinkhorn AS. Stress in dental practice. Dent update. 1991; 18 (2):60-4.
- 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.
- Silverstein ST, Kritz-Silverstein D. A longitudinal study of stress in first-year dental students. J dent educ. 2010; 74 (8):836-48.

5. Inquimbert C, Tramini P, Alsina I, Valcarcel J, Giraudeau N. Perceived stress among French dental students and their opinion about education curriculum and pedagogy. *J Int Soc Prev Community Dent.* 2017; 7 (2):S92.
6. 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.
7. Polychronopoulou A, Divaris K. Dental students' perceived sources of stress: a multi-country study. *J dent educ.* 2009; 73(5):631-9.
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; 78 (2):226-42.
9. Abu-Ghazaleh SB, Rajab LD, Sonbol HN. Psychological stress among dental students at the University of Jordan. *J dent educ.* 2011; 75 (8):1107-14.
10. Shah M, Hasan S, Malik S, Sreeramareddy CT. Perceived stress, sources and severity of stress among medical undergraduates in a Pakistani medical school. *BMC med educ.* 2010; 10(1):2.
11. Aldwin C.M. Culture, Coping and Resilience to Stress. 2004. Available at: [https://www.researchgate.net/publication/241639325\\_Culture\\_Coping\\_and\\_Resilience\\_to\\_Stress](https://www.researchgate.net/publication/241639325_Culture_Coping_and_Resilience_to_Stress)
12. Gomathi K.G., Ahmed S., Sreedharan J. Causes of stress and coping strategies adopted by undergraduate health Professions Students in a university in the United Arab Emirates. *Sultan Qaboos Univ Med J.* 2013;13(3):437-41
13. Coyne JC, Racioppo MW. Never the Twain shall meet. Closing the gap between coping research and clinical intervention research. *Am psychol.* 2000; 55 (6):655-664.
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-Saleh SA, Al-Madi EM, Al-Angari NS, Al-Shehri HA, Shukri MM. Survey of perceived stress-inducing problems among dental students, Saudi Arabia. *Saudi dent J.* 2010;22(2):83-8
16. Al-Sowygh ZH. Academic distress, perceived stress and coping strategies among dental students in Saudi Arabia. *Saudi dent J.* 2013; 25 (3):97-105.
17. 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
18. Hamissi JH, Tabatabaei S, Hamissi H, Hamissi Z. Evaluation of the causes of stress among dental students in Iran. *Acta Medica Mediterranea.* 2016; 32:1335.
19. N.A. Sedky. Perceived Sources of Stress among Junior & Mid-Senior Egyptian Dental Students. *Int. J Health Sci. (Qassim).* 2012;6(2):117-130
20. Garbee Jr WH, Zucker SB, Selby GR. Perceived sources of stress among dental students. *J Am Dent Assoc.* 1980; 100 (6):853-7.
21. Al-Sowygh ZH Alfadley A.A., Al-Saif M.I., Al-Wadei S.H. Perceived causes of stress. *Saudi J Dent Res.* 2013; 4: 7-15
22. Cohen, S., Kamarck, T., Mermelstein, R. A global measure of perceived stress. *J Health Soc Behav.* 1983; 24: 385-396.
23. Tangade PS, Mathur A, Gupta R, Chaudhary S. Assessment of stress level among dental school students: an Indian outlook. *Dent Res J.* 2011, 8(2): 95-101.
24. Carver, C. S., Scheier, M. F., & Weintraub, J. K. Assessing coping strategies: A theoretically based approach. *J Pers Soc Psychol.* 1989;56:267-283. Available at: <http://www.psy.miami.edu/faculty/ccarver/sciCOPEF.html>
25. Madhan B, Ojha A, Gayathri H. Perceived sources of psychological stress in post-graduate orthodontic students in India: A multicenter survey. *J Int Dent Med Res.* 2011,4 (3):123-131.
26. M. Al-Mudares, F. Almaliki. Blood pressure changes of dental students affected by stresses in practicing dentistry. *J Int Dent Med Res* 2012 ;5(3): 161-164.
27. Masulili SLC, Kemal Y, Soedarsono N, Widyastuti Y, Anindhita Harsas N, Maharani DA. The Relationship of Academic Stress to Periodontal Status and Level of Cortisol Hormone, Interleukin 1-β and Interleukin-6 in Gingival Crevicular Fluid (Study on Profession and Specialist Dental Students Faculty of Dentistry Universities Indonesia. Jakarta) *J Int Dent Med Res.* 2016;9(2): 113-117.
28. Crego A, Carrillo-Diaz M, Armfield JM, Romero M. Stress and academic performance in dental students: the role of coping strategies and examination-related self-efficacy. *J dent educ.* 2016;80(2):165-72.
29. Fortes-Ferreira L., Peiró J. M., Conzález-morales G., Martin I. Work-related stress and well-being: the roles of direct action coping and palliative coping. *Scand J Psychol.* 2006; 47: 293-302.
30. Chu-Lien Chao R. Managing stress and maintaining well-being: social support, problem-focused coping, and avoidant coping. *J Couns Dev.* 2011; 89: 338-348
31. Waithaka, A.G., Gough D.M. The Influence of Religion on Stress and Coping of College Students. *IJNREL.* 2017;4(1):27-40.
32. A Pau AK, Croucher R, Sohanpal R, Muirhead V, Seymour K. Emotional intelligence and stress coping in dental undergraduates—a qualitative study. *BDJ.* 2004;197(4):205-209.
33. Ryan, K. How problem focused and emotion focused coping affects college students' perceived stress and life satisfaction. 2013. Dublin Business School. Available at : <http://esource.dbs.ie/handle/10788/1622>.