

Relationship between Level of Stress Experienced by Dental Students during Endodontic Treatment and Their Coping Strategies

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Abstract

Background and Aim: Dentistry is among the most stressful professions. Dentists' occupational stress usually begins during their university education. This study aimed to assess the relationship between the level of stress experienced by dental students during endodontic treatment and their coping strategies.

Materials and Methods: This descriptive study was conducted on 204 fifth and sixth year dental students of Isfahan Islamic Azad University and Dental School of Isfahan University of Medical Sciences. The questionnaires used included 29 questions regarding level of stress experienced during endodontic treatment along with a coping strategies questionnaire, which were filled out by self-reporting. Data were analyzed using the Pearson's correlation coefficient and multiple regression analysis.

Results: Among effective coping mechanisms, only conflict and ambiguity were negatively correlated with overall stress ($P=0.002$). Among ineffective coping mechanisms, anxiety, workload, conflict and ambiguity were significantly correlated with overall stress ($P=0.001$).

Conclusion: Coping mechanisms are directly correlated with level of stress of students such that effective coping mechanisms decrease stress. Male dental students experience higher level of stress due to ineffective coping mechanisms.

Key Words: Stress, Physiological, Adaptation, Psychological, Dentistry, Root Canal Therapy

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Introduction

Dentistry is a stressful career [1]. This stress is often due to the nature of clinical work, working environment and personality traits of individuals who choose this carrier as well as the small field of work, i.e. the oral cavity [2]. Endodontic treatment can cause occupational stress for most dental students and even endodontists due to the type of treatment, indirect view of the field of work and anatomical variations and complexities of the root canal system [2,3]. Several factors affect the

level of stress in dental students. Coping mechanisms are among these factors [4]. Stressful conditions can negatively affect the occupation and wellbeing of dentists. Dental occupational stress has several complications [5-9].

Cherkil et al, [10] in 2013 evaluated the correlation of stress with coping mechanisms in medical students and concluded that a significant association existed between overall stress and coping styles namely negative cope, blame and humor. Kumar et al, [11] in 2009 evaluated the

causes of stress in dental students in the clinical and preclinical courses. They reported the complications caused by stress to be cognitive and physical problems, decreased self-esteem and decreased learning ability. They suggested programs to decrease the stress level of students. Since no previous study is available on the stress coping styles for dental students during endodontic treatment, this study aimed to assess the correlation of effective and ineffective coping mechanisms with the stress experienced by dental students during endodontic treatment (anxiety, workload, loss of control, conflict, ambiguity and overall stress).

Materials and Methods

This descriptive analytical study was conducted to assess the correlation of effective and ineffective coping mechanisms with stress experienced by dental students during endodontic treatment namely anxiety, workload, loss of control, conflict, ambiguity and overall stress. Simple and multiple logistic regressions were used for assessment of this correlation. The study was conducted on 204 fifth and sixth year dental students of Isfahan Islamic Azad University (n=110) and Dental School of Isfahan University of Medical Sciences (n=94). Sample size was calculated to be 220 based on a previous study [12] and 220 participants were chosen using convenience sampling. After collecting the questionnaires, 10 questionnaires (8.3%) collected from Isfahan University of Medical Sciences and 6 collected from Islamic Azad University were excluded since they were incomplete. Thus, 204 questionnaires (110 from Islamic Azad University and 94 from Isfahan University of Medical Sciences) were evaluated.

Endodontic treatment stress questionnaire:

To assess the stress experienced by dental students when performing endodontic treatment, a researcher-designed questionnaire was designed by the help of an endodontist and a psychologist with 15 questions. The questionnaire was designed based on stress and anxiety domains and emphasized on experiencing these feelings during performing endodontic treatment. The response options were based on a five-point Likert scale (1=never, 5=forever). The questionnaire was modified according to the opinion of the experts

until its face validity and content validity were confirmed. It was ensured that the questionnaire was understandable for dental students and had optimal internal validity. To assess the construct validity of the questionnaire, 15 questions were subjected to exploratory factor analysis and KMO was found to be 0.89. The Bartlett's sphericity test result was found to be 1832.86 ($P < 0.001$), which showed that the factor analysis was feasible. Considering the load factor > 0.4 , three factors with the values of 6.4 (42.68% variance), 2.7 (18.03% variance) and 1.01 (6.7% variance) and variance of 67.41 for the entire questionnaire were obtained. Considering the content of questions covering the three factors, the first factor was named anxiety and workload with seven questions, the second factor was named loss of control with four questions and the third factor was named conflict and ambiguity with four questions. The Cronbach's alpha was found to be 0.87, 0.86 and 0.86 for the three factors namely anxiety and workload, loss of control, and conflict and ambiguity. The stress score of students in this questionnaire was determined as the sum of scores for each question (based on the five-point Likert scale of 1: never and 5: forever). The sum of scores for 15 questions was determined and then the total score was divided by the number of questions (seven, four and four for the three subscales and 15 for the total questionnaire). Thus, the scores for the three subscales and total questionnaire ranged from 1 to 5.

Coping strategies questionnaire:

A 14-question questionnaire by Park [12] (2007) was used for assessment of coping strategies. This questionnaire included two subscales including ineffective coping strategies (seven questions) and effective coping strategies (six questions) with four-point Likert scale responses (1= never and 4: most of the time). Park [12] (2007) confirmed the construct validity of this questionnaire by exploratory factor analysis with Cronbach's alpha of 0.6 and 0.61 for ineffective and effective coping strategies, respectively. This questionnaire was translated to Farsi by Golparvar et al, [13] in 2012 and its face validity and content validity were confirmed. They assessed the construct validity of this questionnaire by exploratory factor analysis and evaluated ineffective (seven questions) and

effective (six questions) coping strategies similar to the original version with Cronbach's alpha of 0.7 and 0.71, respectively. The questionnaires were self-reported. Before administration of questionnaires, participants were briefed and then filled out the questionnaires. After collection, the questionnaires were evaluated one by one and incomplete questionnaires were excluded. Data were extracted and analyzed using descriptive statistics via frequency tables and percentages. The mean and standard deviations were also calculated. For analytical statistics, the Pearson's correlation coefficient and multiple regression analysis were performed. Type one error was considered as 0.05 and type two error was considered as 0.2 (study power of 0.8). All statistical analyses were performed using SPSS version 18 (SPSS Inc., IL, USA).

Results

Table 1 shows the frequency and percentage of participants in terms of academic year and their demographics. Of 204 dental students, 55 (27%) were in the fifth year and 149 (73%) were in the sixth year of dental education. Of all, 43 (69.1%) were younger than 23 years, 141(69.1%) were between 24-27 years and 4 (2%) were older than 28 years. Sixteen subjects did not mention their age. Of all, 107 (83.3%) were single, 30 (14.7%) were married and 4 did not mention their marital status. Of all, 147 (72.1%) were females and 57 (27.9%) were males.

Table 2 shows the mean, standard deviation and standard error of variables. The mean score of effective and ineffective coping strategies was 3.82 and 1.82, respectively. The mean scores of effective and ineffective coping strategies based on the four-point Likert scale were higher and lower than the mean scale of 2.5. In other words, the level of effective coping strategies was higher than the mean and the level of ineffective coping strategies was lower than the mean value. Regarding the stress experienced during performing endodontic treatment, the mean scores of anxiety and workload, loss of control, conflict and ambiguity and overall stress score were 2.64, 2.98, 2.27 and 2.63, respectively. The mean stress score was less than the average based on the five-point Likert scale with an average scale of 3.

As shown in Table 3, only ineffective coping strategies were significantly correlated with overall stress in endodontic treatment ($P<0.05$). Thus, the coping strategies (both effective and ineffective) were significantly correlated with overall stress score ($P<0.05$, Table 3). Effective coping strategies were inversely correlated with conflict and ambiguity only ($P<0.05$). Ineffective coping strategies were significantly correlated with anxiety and workload and, conflict and ambiguity ($P<0.05$). As shown in Table 4, gender was only significantly correlated with ineffective coping strategies ($P<0.05$).

Discussion

As stated earlier, dentistry is a stressful profession. Stress decreases the efficiency and efficacy of work and increases the risk of procedural errors. This study was the first to assess the effect of stress coping strategies on level of stress experienced by dental students during conduction of endodontic treatment. Accordingly, some strategies can be suggested to decrease stress and improve performance both during academic education and in the future. The results of this study showed that ineffective coping strategies were significantly correlated with overall stress. In other words, participants using ineffective coping strategies had higher overall stress score. Cherkil et al, [10] in 2013 reported that a significant association existed between overall stress and coping styles namely negative cope, blame and humor (which are ineffective coping strategies); their results were in line with ours. Based on the results of this study, when people use ineffective coping strategies, they cannot change the situation to overcome their stress (in contrast to the use of effective coping mechanisms). Thus, over time, they feel inefficient since they cannot change the stressful conditions. This further increases their level of stress. A significant association was noted between ineffective coping mechanisms and occupational stress. On the other hand, it should be noted that effective coping strategies and endodontic treatment stress were not significantly correlated. It is expected that effective coping strategies decrease the level of stress experienced by dental students. However, no such result was obtained in the current study. The reason may be due to the

fact that the mean stress experienced by students based on the five-point Likert scale was less than

Table 1. Demographic data

Academic year	Frequency	Frequency percentage	Cumulative frequency percentage
Fifth year	55	27	27
Sixth year	149	73	100
Age groups			
≤23 years	43	21.1	21.1
24-27 years	141	69.1	90.2
≥28 years	4	2	92.2
Not declared	16	7.8	100
Marital status			
Single	170	83.3	83.3
Married	30	14.7	98
Not declared	4	2	100
Gender			
Female	147	72.1	72.1
Male	57	27.9	100

Table 2. Descriptive statistics

Variable	Groups	Mean	Standard deviation
Coping strategies	Effective	3.82	0.43
	Ineffective	1.82	0.48
Stress	Anxiety and workload	2.64	0.75
	Loss of control	2.98	0.95
	Conflict and ambiguity	2.27	0.86
	Overall stress	2.63	0.67

Table 3. Correlation of coping strategies and stress during endodontic treatment

Coping strategies	Anxiety and workload		Loss of control		Conflict and ambiguity		Overall stress	
	r	P	r	P	r	P	r	P
Effective	-0.13	0.054	-0.13	0.06	-0.22*	0.002	-0.08	0.24
Ineffective	0.38**	0.001	0.02	0.74	0.47**	0.001	0.33**	0.001

Table 4. Correlation of gender and coping strategies

Coping strategies	Gender	Mean	Standard deviation	value	Squared value	Significance
Effective	Male	1.83	0.48	0.03	0.001	0.84
	Female	1.82	0.41			
Ineffective	Male	2.94	0.45	0.16	0.025	0.02
	Female	2.77	0.49			

the average score of 3. It means that the level of stress was below average. There is a possibility that by an increase in this level, this association becomes significant. This needs to be evaluated in future studies. Gender was significantly correlated with ineffective coping strategies. Thus, instructors must put more emphasis on instructing effective coping strategies to male students compared to females.

Conclusion

Based on the results of this study, coping strategies have a direct correlation with level of stress of students such that effective coping strategies decrease the stress of students. Also, male students had higher level of stress since they used ineffective coping strategies.

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