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# Evaluation of Emotional intelligence and Perceived Stress in Dental Undergraduates: a Cross-sectional Study

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**ABSTRACT**:
**Introduction***:* Emotional intelligence (EI) is a tool with those working in stressful environment and managing high work pressure in different settings. Dentistry is considered as a highly demanding and stress oriented profession. Elevated stress levels due to prolonged workload may precipitate fatigue declining student performance. The aim of the present study was to assess the Perceived sources of stress among first year dental undergraduate students at a private institution in India and if there was any significant relation between EI and Perceived stress. **Materials and methods**: It was a Descriptive, Epidemiological, Institution based Cross-sectional study. The Schutte Emotional Intelligence Scale and modified dental environment stress (DES) questionnaire were administered to 84 First year dental students to assess the levels of Emotional Intelligence and stress. **Results***:* The major stressor for all students was lack of time for relaxation followed by examination and grades. Students belonging to nuclear family were found to perceive significantly greater stress and have lesser Emotional Intelligence than those of Joint family. (p=0.001). By Pearson's correlation, there was a strong negative correlation between Perceived Stress and EI, which means that high Perceived stress variable scores go with low Emotional Intelligence variable scores.( P <0.00001) . **Conclusion**: The primary sources of stress were increased workload and Performance pressure. This study examined the link between perceived stress and emotional intelligence in First year undergraduate dental students. This study would contribute to enhance students' stress-bearing skills and help in deciding future course of action through counselling and psychiatric support systems.

***Keywords: First year BDS students, Questionnaire based study, Schutte Emotional Intelligence Scale, Modified DentalEnvironment Stress (DES) Questionnaire***

## INTRODUCTION:

Stress is a psychological or physiological imbalance resulting due to the disparity between situational demand and the individual's ability and motivation to meet those needs. It is better defined as the body's response to any real or imagined event perceived as requiring some adaptive response and/or producing strain [1] Stress is usually an emotional discrepancy which may be due to various reasons such as financial issues, job selections, social status, level of education, competition with colleagues and family problems. [2]High-stress levels may even impair the immune system function [3]

Emotional intelligence (EI) is understanding one's own feeling and able to handle those feelings without disturbing themselves. Research indicates that unconventional methods of assessing intelligence such as emotional intelligence may be an enhanced predictor than customary psychometric methods like intelligence quotient and other traditional measures of educational achievement. Emotional intelligence involves one's ability to access and create feelings when they facilitate thought, and the ability to appreciate one's emotions and its knowledge to control emotions to encourage emotional and intellectual growth. [4]

Dentistry is considered as a highly demanding and stress oriented profession.[5]Dental students have to face the additional stress of study in addition to the stress related to dentistry as a profession. Moreover, increasing stress may result in declining student performance. Some sources of stress include changes in sleeping habits, lack of holidays, irregular eating habits, increased workload and new responsibilities [6]. Elevated stress levels due to prolonged workload may precipitate long- term work-related exhaustion.

Over the past three decades, there is an increase in the stress reported among medical students from all over the world.[7,8] A study from Seth G.S. Medical

College in Mumbai showed that 73% of the medical students participated in the study had stress[9] Like medical students, dental students also are prone to develop stress because of the vast syllabus and other academic activities, social and personal issues. Many studies are reported in various parts of the world,[10] but studies from dental colleges from India are less.[11,12] A study conducted by Chilukuriet al. from Tamil Nadu revealed a high prevalence of stress among dental students whereas another study conducted at Raichur, Karnataka, showed a prevalence rate of 29.5% only.[11]

Studies have proved that emotional intelligence usually advances with age and experience. Dental and medical school may be stressful and the potential to cope with such a situation can be the key to success for these students.[13] The academic success and well-being of an individual are governed by the balance between academic and personal experiences. However, psychometric studies pertaining to EI scales used for health care professionals are rarely conducted which decides the individual level of coping and handling stress in their workplace. These studies provide a basis to decide whether there is a need to expand the research dedicated to emotional intelligence in healthcare education.

Although studies have been conducted on medical and dental undergraduates to evaluate the causes of stress. However, to our knowledge no study has been reported on the relationship between Emotional Intelligence and perceived stress among Eastern Indian dental students. In this study, we aimed to assess EI and perceived stress of the 1st year undergraduate students of the private dental institution as well to ascertain their relationship. This can further lead to enhance students' stress-bearing skills and also may help to prevent student burnout.

## OBJECTIVES:

1. To assess the Perceived sources of stress among first year dental students.
2. To assess Emotional Intelligence among first year dental students
3. To investigate whether there is any relationship between EI and Perceived Stress.

## MATERIALS & METHODS:

***Ethical Clearance***: Study commenced after obtaining the ethical clearance from Institutional Ethics Committee of Medical College, Kolkata. Written Permission was also obtained from the authorities of the private dental college where study was conducted.

***Study Type****:* Descriptive, Epidemiological, Institution based

***Study Design****:* Cross-sectional.

***Study Area****:* The study was conducted at a private dental college and hospital in Kolkata

***Study Period****:* Total study duration was 3 months. (September 2023- November 2023)

***Study Population****:* The study population was all the First year Dental (BDS) students, who got admission at the private dental college and hospital in Kolkata, in 2023-24 session.

### Inclusion Criteria*:*

1. All First year Undergraduate BDS students enrolled in the said private dental college and hospital in Kolkata in 2023-24 session.
2. Those who gave written consent for participation.

### Exclusion Criteria:

1. Those who could not be approached for data collection
2. Those who would not give consent.
3. Students who were already diagnosed with depression and taking treatment for any Psychiatric condition.

**Sample Size***:* The total number of 1st year BDS students enrolled in the said private dental college and hospital in Kolkata was 102. Out of them, 84 participated in the study.

**Sampling Design***:* Complete enumeration was done.[14]

**Study Tool***:* The questionnaire was divided into three parts. First part comprised of demographic information like age gender and type of family. The second part of the questionnaire was based on stress aggravating factors. The third part was related to Emotional Intelligence.

**Perceived Stress**: Stress was measured using a modified dental environment stress (DES) questionnaire [15] which consists of 38 questions that are applicable to the Indian dental education background. [Fig: 1]

The categories were- self-efficacy beliefs, Faculty and administration, Workload, Preclinical and clinical training, Performance pressure and Other. Questions related to clinical training 3, 4, 10, 16, 18, 19, 25, 26, 27, 28, 29 and 38 were excluded from the questionnaire administered to non-clinical First year students.

| |
|---|
| **Self-efficacy beliefs** |
| 1 Lack of confidence to be a successful dental student |
| 2 Lack of confidence to be a successful dentist |
| *3 Completing clinical requirements* |
| *4 Fear of not having possibility to pursue a postgraduate dental education programme* |
| 5 Lack of confidence in own decision making |
| 6 Fear of failing a course or a year |
| 7 Difficulty in understanding lecture materials |
| 8 Language barrier |
| 9 Fear of unable to catch up if getting behind the work |
| **Faculty and administration** |
| *10 Atmosphere created by clinical supervisors* |
| 11 Receiving criticism from supervisors about academic or clinical work |
| 12 Amount of cheating in dental faculty |
| 13 Rules and regulations of the faculty |
| 14 Approachability of teaching staff |
| 15 Expectation of dental faculty and what in reality it is like |
| *16 Availability of supervisors in clinic* |
| 17 Attitudes of faculty towards women dental students |
| *18 Shortage of allocated clinical time* |
| *19 Differences in opinion between clinical staff concerning patient treatment* |
| **Workload** |
| 20 Amount of work assigned |
| 21 Full working day |
| 22 Lack of time for relaxation |
| 23 Lack of time to do assigned college work |
| 24 Late ending time |
| **Patient treatment** |
| *25 Lack of cooperation by patient in their home care* |
| *26 Responsibilities for comprehensive patient care* |
| *27 Patients being late or not showing for their appointments* |
| *28 Working on patients with dirty mouths* |
| **Preclinical and clinical training** |
| *29 Difficulty in learning clinical procedures* |
| 30 Difficulty in learning precision manual skills required for preclinical and laboratory work |
| **Performance pressure** |
| 31 Competition with peers for grades |
| 32 Examination and grades |
| **Other** |
| 33 Relation with members of the opposite sex |
| 34 Difficult home/ hostel environment in which to study |
| 35 Fear of unemployment after graduation |
| 36 Financial resources |
| 37 Personal physical health |
| 38 Availability of laboratory technicians |

**Figure: 1 Modified dental environment stress (DES) questionnaire**

Questions in the italics were excluded from the questionnaire administered

**EI scale:** A 33-item questionnaire developed by Schutte et al. with a 5-point Likert-type scale was used.[16] It is a self-administered,structured, prevalidated questionnaire where the students have to read each and every statement and

choose from among “strongly disagree,” “disagree,” “ neutral,” “agree,” or “strongly agree” for every statement. [Fig: 2]

| |
|---|
| 1) I know when to speak about my personal problems to others |
| 2) When I am faced with obstacles, I remember times I faced similar obstacles and overcame them |
| 3) I expect that I will do well on most things I try |
| 4) Other people find it easy to confide in me |
| 5) I find it hard to understand the non-verbal messages of other people* |
| 6) Some of the major events of my life have led me to re-evaluate what is important and not important |
| 7) When my mood changes, I see new possibilities |
| 8) Emotions are one of the things that make my life worth living |
| 9) I am aware of my emotions as I experience them |
| 10) I expect good things to happen |
| 11) I like to share my emotions with others |
| 12) When I experience a positive emotion, I know how to make it last |
| 13) I arrange events others enjoy |
| 14) I seek out activities that make me happy |
| 15) I am aware of the non-verbal messages I send to others |
| 16) I present myself in a way that makes a good impression on others |
| 17) When I am in a positive mood, solving problems is easy for me |
| 18) By looking at their facial expressions, I recognize the emotions people are experiencing |
| 19) I know why my emotions change |
| 20) When I am in a positive mood, I am able to come up with new ideas |
| 21) I have control over my emotions |
| 22) I easily recognize my emotions as I experience them |
| 23) I motivate myself by imagining a good outcome to tasks I take on |
| 24) I compliment others when they have done something well |
| 25) I am aware of the non-verbal messages other people send |
| 26) When another person tells me about an important event in his or her life, I almost feel as though I have experienced this event myself |
| 27) When I feel a change in emotions, I tend to come up with new ideas |
| 28) When I am faced with a challenge, I give up because I believe I will fail* |
| 29) I know what other people are feeling just by looking at them |
| 30) I help other people feel better when they are down |
| 31) I use good moods to help myself keep trying in the face of obstacles |
| 32) I can tell how people are feeling by listening to the tone of their voice |
| 33) It is difficult for me to understand why people feel the way they do* |

**Figure 2: The 33-item emotional intelligence scale developed by Schutte et al.**
***These items are reverse scored.**

From the total 33 items in the model, thirteen items belonged to appraisal and expressions of the emotions, 10 items in the regulation of emotion category, and the remaining 10 items to the utilization of emotion category.
Out of 33 items, 5, 28, and 33 were reversed scored for crosschecking [17]

**Data collection and interpretation**: The study was conducted during the middle of the academic year 2023-2024. Questionnaires were distributed by the authors during one lecture for with prior permission from the Dean of the institution and the aims of the study were explained. The time allocated for completion of the questionnaire was 30 minutes. The questionnaire was distributed and submitted anonymously for assuring confidentiality to the students. All participants took part in the study voluntarily and no incentives were used for the respondents. Students who could not be approached for data collection after three attempts were excluded from the study.

**STATISTICAL ANALYSIS**:
The data was entered and analyzed using SPSS (statistical package for the social sciences) statistical software 22 version. Means and standard deviations were determined for stress scores of individuals for

each item and used to compare the genders. Students' t-test (unpaired) was used for two group comparisons like gender difference. A p value of less than 0.05 was considered statistically significant. Descriptive statistics, Pearson's correlation test and Chi square test were used to determine the significant differences, as required.

**RESULT**:

Out of a total of 102 students, 84 participated in the study for a participation rate of 82.35%. Mean age of all the participants was 21.06 ± 3.26 years. Out of them Mean age of male participants was 21.47 ± 4.65 years, while Mean age of female participants was 20.72 ± 1.26 years.

**Table 1: Distribution of participants according to their Demographic Characteristics studied**

| Characteristics | Frequency | Percent |
|---|---|---|
| **Age group** | | |
| ≤21 | 59 | 70.24 |
| >21 | 25 | 29.76 |
| **Gender** | | |
| Male | 38 | 45.1 |
| Female | 46 | 54.9 |
| **Family** | | |
| Nuclear | 72 | 85.7 |
| Joint | 12 | 14.3 |

Mean age of the participants was 20.79± 1.41 year, out of which Mean age of male participants was 20.87 ± 1.6 years, while Mean age of female participants was 20.72 ± 1.26 years

**Table 2: Overall Modified Dental Environment Stress (DES) Questionnaire Score among the Participants**

| DES Questionnaire | Score Mean ±SD |
|---|---|
| **Self-efficacy beliefs** | **11.94±2.58** |
| 1 Lack of confidence to be a successful dental student | 1.77± 0.7 |
| 2 Lack of confidence to be a successful dentist | 1.81±0.67 |
| 5 Lack of confidence in own decision making | 1.65±0.75 |
| 6 Fear of failing a course or a year | 1.80±0.77 |
| 7 Difficulty in understanding lecture materials | 1.5±0.61 |
| 8 Language barrier | 1.35±0.63 |
| *9 Fear of unable to catch up if getting behind the work* | *2.06±0.83* |
| **Faculty and administration** | **9.39±2.79** |
| 11 Receiving criticism from supervisors about academic or clinical work | 1.82±0.81 |
| 12 Amount of cheating in dental faculty | 1.43±0.66 |
| 13 Rules and regulations of the faculty | 1.68±0.93 |
| 14 Approachability of teaching staff | 1.39±0.62 |
| 15 Expectation of dental faculty and what in reality it is like | 1.76±0.82 |
| 17 Attitudes of faculty towards women dental students | 1.31±0.6 |
| **Workload** | **10.67±2.76** |
| 20 Amount of work assigned | 1.93±0.76 |
| *21 Full working day* | *2.12±0.83* |
| *22 Lack of time for relaxation* | *2.35±0.85* |
| *23 Lack of time to do assigned college work* | *2.2±0.85* |
| *24 Late ending time* | *2.07±0.83* |
| **Preclinical and clinical training** | **1.87±0.77** |
| 30 Difficulty in learning precision manual skills required for preclinical and laboratory work | **1.87±0.77** |
| **Performance pressure** | **4.26±1.53** |
| 31 Competition with peers for grades | 2.02±0.88 |
| *32 Examination and grades* | *2.24±0.82* |
| **Other** | **9.86±2.2** |
| 33 Relation with members of the opposite sex | 1.32±0.62 |
| 34 Difficult home/ hostel environment in which to study | 1.51±0.72 |
| 35 Fear of unemployment after graduation | 2.02±0.93 |
| 36 Financial resources | 1.93±0.72 |
| 37 Personal physical health | 1.58±0.7 |
| 38 Availability of laboratory technicians | 1.49±0.67 |
| **Total** | **47.80 ± 8.51** |

**Questionnaire in Italics were top six stressors among students. [Table 2]**

**Table 3: Observed Characteristics of Emotional Intelligence (EI Scale developed by Schutte et al.)**

| Emotional Intelligence Score | Frequency (Percent) | Mean ± SD |
|---|---|---|
| **Low** | 48 (57.1) | 89.6±12.22 |
| **High** | 36 (42.9) | 135.25±12.3 |
| **Total** | 84 (100) | 109.17±25.77 |

Out of 84 students, 48 (57.1%) had low Emotional Intelligence. The Mean Emotional score of all the participants was 109.17±25.77 [Table 3]

**Table 4: Evaluation of the Perceived Stress and Emotional Intelligence, according to the age group, gender and Family**

| Variables | Perceived Stress (Modified DES Score)Mean ± SD | Emotional Intelligence (EI Score)Mean ± SD |
|---|---|---|
| **Age Group** | | |
| ≤21 | 48.27±8.7 | 109.1±26.16 |
| >21 | 47.32±8.34 | 109.32±24.83 |
| p value | 0.645 | 0.972 |
| **Gender** | | |
| Male | 48.71±8.72 | 96.08±21.62 |
| Female | 47.39±8.56 | 119.98±24 |
| p value | 0.487 | <0.0001* |
| **Family** | | |
| Nuclear | 49.82±7.62 | 105.44±24.99 |
| Joint | 37±5.28 | 131.5±17.77 |
| p value | <0.0001* | 0.0009* |

*** p<0.05 taken as significant**

The emotional intelligence was higher in females when compared to males while the perceived stress was higher in males when compared to females (25.90%). There was a difference in high and low EI scores among males and females, and it was found to be statistically significant (p <0.0001). [Table 4]

It was observed that among students who belonged to Nuclear family, had significantly higher stress score than those belonging to Joint family (p<0.0001). Students who belonged to Nuclear family also had significantly lower EI score than those belonging to Joint family. (p=0.0009) [Table 4]

Modified Dental Environment Stress Score was divided in to two categories where < mean Score (47.9) was determined as low stress and more than equal to mean score was determined as high stress.

Emotional Intelligence Score was divided in to two categories where < 75% Score (111.75) was determined as Low Emotional Intelligence and ≥75% was determined as high Emotional Intelligence.

**Table 5: Chi-square test showing association of included variables with Perceived Stress and Emotional Intelligence**

| Variables | Perceived Stress (%) | | $\chi^2$ value | p value | Emotional Intelligence (%) | | $\chi^2$ value | p value |
|---|---|---|---|---|---|---|---|---|
| | Low Stress < Mean score (<47.9) | High Stress ≥ Mean Score (≥47.9) | | | Low Emotional Intelligence (<111.75) | High Emotional Intelligence (≥111.75) | | |
| **Age group** | | | | | | | | |
| ≤ 21 Years | 27 (45.8) | 32 (54.2) | 0.737 | 0.391 | 35 (59.3) | 24 (40.7) | 0.08 | 0.778 |
| > 21 Years | 14 (56) | 11 (44) | | | 14 (56) | 11 (44) | | |
| **Gender** | | | | | | | | |
| Male | 17 (44.7) | 21 (55.3) | 0.461 | 0.497 | 26 (68.4) | 12 (31.6) | 2.91 | 0.088 |
| Female | 24 (52.2) | 22 (47.8) | | | 23 (50) | 23 (50) | | |
| **Family** | | | | | | | | |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Nuclear | 30 (41.7) | 42 (58.3) | | | 48 (66.7) | 24 (33.3) | 14.4 | 0.0001* |
| Joint | 11 (91.7) | 1 (8.3) | 10.29 | 0.001* | 1 (8.3) | 11 (91.7) | | |

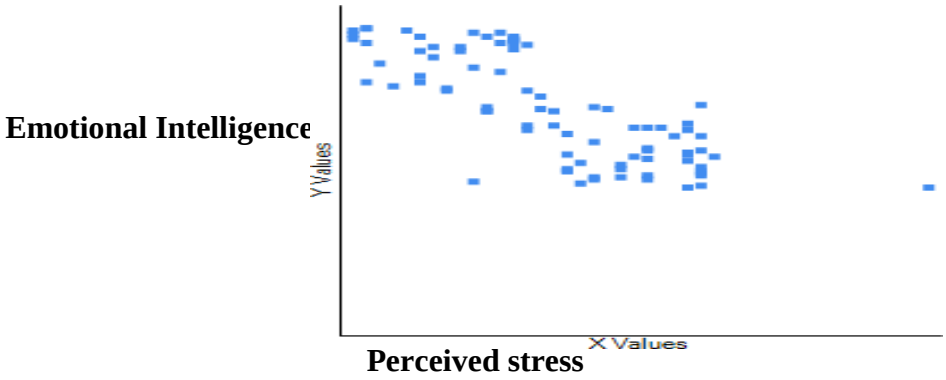
*** p<0.05 taken as significant**

Among all the students, 41(48.81%) were in the low stress group, while 43(51.19%) were in the high stress group. 49(58.33%) were in the Low Emotional Intelligence group, while 35(41.67%) were in the high Emotional Intelligence group. [Table 5]. Among students aged less or equal to 21 yrs, 27 (45.8%) were in the low stress group, while 32 (54.2%) were in the high stress group. 35(59.3%) were in the Low Emotional Intelligence group, while 24(40.7%) were in the high Emotional Intelligence group. [Table 5] Among male students, 17 (44.7%) were in Low stress group, whereas 21(55.3%) were in high stress group. 26(68.4%) were in the Low Emotional Intelligence group, while 12(31.6%) were in the high Emotional Intelligence group. [Table 5] Among Female students, 24 (52.2%) were in Low stress group, whereas 22(47.8%) were in high stress group. 23(50%) each were in the Low Emotional Intelligence group and in the high Emotional Intelligence group. [Table 5].

It was also observed that among students who belonged to Nuclear family, 30 (41.7%) were in Low stress group, whereas 42(58.3%) were in high stress group. In case of students who belonged to Joint family, 11 (91.7%) were in Low stress group, whereas 1(8.3%) were in high stress group. So students belonging to nuclear family were found to perceive significantly greater stress than those of Joint family. (p=0.001). [Table 5]

Similarly, among students who belonged to Nuclear family, 48 (66.7%) were in Low Emotional Intelligence group, whereas 24(33.3%) were in high Emotional Intelligence group. In case of students who belonged to Joint family, 1 (8.3%) were in Low Emotional Intelligence group, whereas 11(91.7%) were in high Emotional Intelligence group. So students belonging to Joint family were found to perceive significantly greater Emotional Intelligence than those of Nuclear family. (p=0.0001). [Table 5]

**Figure 3: Graph showing Correlation of emotional intelligence and perceived stress according to Pearson's Correlation test**




The value of R is -0.7756.This is a strong negative correlation, which means that high Perceived stress variable scores go with low Emotional Intelligence variable scores (and vice versa). The p value is <0.00001. [Fig: 3]

## DISCUSSION:

This is the first self-administered questionnaire based survey among dental undergraduates in Eastern India assessing the association between EI and Perceived stress.

In our study, total 43(51.19%) students were in the High stress group. Among male students, 21(55.3%) were in high stress group whileamong Female students, 22(47.8%) were in high stress group. In a study conducted among 273 students of a dental college in Telangana using Kessler 10 Psychological Distress instrument, 58% were having stress.[12] On the other hand, in a study conducted among dental students at Raichur, the prevalence of stress was found to be only 29.5% [18]

The aim of the present study was to identify the perceived sources of stress amongst Indian dental undergraduate students and was to find whether there is any association between EI and Perceived Stress among First year dental undergraduates that may provide administrators an opportunity to be proactive in their approach to students and to modify the teaching curriculum to be more conducive to the students. Study conducted by Sekhonet al in India found that most commonly observed factors of academic stress includes marks in exams (95%), not enough time between the exams (94%) and fear of failure (90.5%).[19]

Study conducted by Ishaqueel al in Rawalpindi city of Pakistan described that the most common stress among dental students was the fear of failing in annual exams along with huge syllabus. [20]

In this study the first major stressor for all the students was lack of time for relaxation which is in accordance with previous findings. However a mean score of 2.35 (SD 0.85) is very low when compared with studies from the USA, Singapore, Australia and Jordan where the

mean scores were 3.22, 3.14, 3.34 and 3.49 respectively. Students in earlier years tended to have higher levels of stress when compared with later years on items related to academic performance supported by previous studies [21].

In our study 4 of the six highest stressors were related to Workload. This was similar to a previous study based in Karnataka.[22]

In our study, females score higher than males on the EI scale than males which was in accordance with one of the studies by Ciarrochi et al. [23] which might be due to ability of the females to have greater skills at perceiving emotions as well as regulating others' emotions.

The males had a higher stress compared to females, which is in accordance with the study done by Salovey et al.[24]

In our study, students belonging to nuclear family were found to perceive significantly greater stress than those of Joint family. (p=0.001). The cause may be the underlying beliefs and social systems that differs between a Joint and a Nuclear family. Similarly, students belonging to Joint family were found to perceive significantly greater Emotional Intelligence than those of Nuclear family.(p=0.0001)

There was a strong negative correlation between Perceived stress and Emotional Intelligence that means Lower EI scores were associated with increased perceived stress.(and vice versa). The p value is <0.00001.

## CONCLUSIONS:

The primary sources of stress as perceived by dental students were lack of time for relaxation, examination and grades, Lack of time to do assigned college work, Full working day, Late ending time and Fear of unable to catch up if getting behind the work. In the present study, males expressed higher levels of stress compared to females, so a stress management program should be conceived with special attention towards male dental students. 4 of the top 6 stressors were related to performance pressure and workload. It appears there is a need for the establishment of student advisors and counsellors combined with a faculty advising system in addition to student-oriented programs. It was also observed that students from Nuclear family expressed higher levels of stress and lower Emotional Intelligence compared to those from Joint family, so inquiry and insight of socio-economic and family life of the students will give better understanding in handling the stress. There was a strong negative correlation between Perceived stress and Emotional Intelligence, that means Lower EI scores were associated with increased perceived stress.(and vice versa). So Emotional intelligence can be a powerful tool to combat the high academic and work pressure in a stressful professional environment and individual counselling in development and advancement of Emotional Intelligence can pave the road for success in combatting stress. Future research is recommended with a greater sample size to look at these variables longitudinally at different time of the academic year and also across all the Professional years to try and achieve a better understanding of the evolution of stress and Emotional Intelligence through the dental curriculum.

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