

PERCEIVED SOURCES OF STRESS AMONG DENTAL STUDENTS IN SOUTH INDIA

<sup>1</sup>Sudhakar Kaipa  
<sup>2</sup>Shanthi Margabandhu  
<sup>3</sup>Nusrath Fareed  
<sup>4</sup>Krishna Kumar R.V.S

<sup>1</sup>Senior Lecturer  
<sup>2</sup>Professor  
<sup>3</sup>Professor And Head  
<sup>4</sup>Senior Lecturer

<sup>1</sup>, Department Of Public Health Dentistry, Mamatha Dental College and Hospital, Khammam, Andhra Pradesh.  
<sup>2,3,4</sup> Department Of Public Health Dentistry, Narayana Dental College and Hospital, Nellore. Andhra Pradesh.

ABSTRACT:

**Introduction:**Stress in dental students may be multifactorial, arising from both the academic and socio-cultural environment, and attributable to social support issues. The intensity of the bachelor of dental surgery curriculum requires enormous commitment and hard work by students which may produce stress on them. This study was conducted with an aim to investigate perceived sources of stress among dental students in South India. **Methods:** A modified version of the Dental Environment Stress questionnaire was used to measure sources of stress. **Results:** A total of 343 of the 369 registered undergraduate students participated in the study with an overall response rate of 92.9%. Among them, 167 (48.6%) were males and 176 (51.3%) were females. Mean age of the total sample was 20.19 (1.5) years. Examinations were perceived to be the highest sources of stress followed by fear of unemployment after graduation and fear of failing the year. **Conclusion:** Stress levels were slight to moderate and were higher amongst senior students. Students during clinical training period exhibited higher levels of stress. Overall third years were the most stressed followed by fourth years, second years and first years.

**Key words:** Stress, Dental students, Dental education, India

INTRODUCTION

Student life is said to be a best period for any person. However they face a significant amount of stress due to various factors. Many aspects of college life, as well as the stress that comes with it, can all impact a student's physical and emotional health. Before condemning stress outright, we need to understand that stress is only harmful when it is excessive. Some stress is desirable to prevent boredom and under-stimulation, but the persistence of stress-related symptoms may result in mental and/or physical ill health, substance abuse, and diminished efficiency at work or learning<sup>1</sup>. Dentistry is recognized as a highly stressful profession and dental education is also included as being a stressful learning environment due to the dental profession requiring interpersonal skills and clinical competencies as well as theoretical knowledge<sup>2,3</sup>. Several studies identified the major academic stressors among dental college students to be examinations, competition for grades, fear of failing the year and inadequate time for relaxation<sup>1,4,5,6</sup>. Contemporary curricula require dental students to attain diverse proficiencies, including the acquisition of theoretical knowledge, clinical competencies and interpersonal skills<sup>4</sup>.

Stress in dental students may be multifactorial, arising from both the academic and socio-cultural environment, and attributable to social support issues (emotional and

financial)<sup>7</sup>. It has been reported that stress negatively affects the academic performance of dental students and that they are more anxious than general population, showing higher levels of depression, obsessive-compulsive disorders, and interpersonal sensitivity than age-matched norms<sup>8</sup>. Although increasing stress may result in declining student performance, high levels of stress can result in wide variety of physical and psychological complaints and reaction to stress is influenced by a person's system of beliefs and attitudes. The stressors in dental students were generally related to internal factors related to the course. It was also suggested occupational hazards related to practice environment, such as materials used and intra-surgery risk including aerosols, particulate debris, and noise, could further exacerbate the problem<sup>9</sup>. It is clear; admission to dental schools is not seen just as a stressful course but also as a stressful career<sup>10,11</sup>. Stress also arises from the need to meet treatment requirements, to pass stringent academic assessments, and is related to clinical and supporting staff<sup>12</sup>. Moreover, uncertainty about dentistry as a career and unhealthy perfectionism may predispose to stress<sup>13</sup>. It has also been found academic pressure, service working hours, as well as clinical events are more stressful than personal problems<sup>14,15</sup>. In a study<sup>10</sup>, it was concluded that many factors led to dentistry being

particularly stressful: the combination of time pressure, frightened patients, financial problems, staff supervision and the routine and boring work regime.

The perception of stress differs between individuals and can be influenced by the ability to cope with pressure, a factor often influenced by personal beliefs and attitudes<sup>16</sup>. Previous studies showed that stress levels in dental students may vary according to ethnic differences as well as gender and year of study<sup>12,17</sup>. In India, the duration of the Bachelor of Dental Surgery programme is of four calendar years with progression examination at the end of each year, followed by 1 year paid rotatory internship in the dental colleges and is governed by the Dental Council of India. During the first 2 years of graduation, students are taught basic sciences and preclinical dentistry whereas the later years are dedicated for imparting clinical education. In the hope of preparing students for their future roles as successful dentists, it is important to identify stressful factors that may affect their successful development. This is especially true since student stress has been associated with a variety of negative outcomes, including effects on general and health-related quality of life. Hence a study was undertaken with an aim to evaluate the perceived sources of stress among dental students of Narayana Dental College, Andhra Pradesh in south India.

#### Materials And Method

**Study design:** This Questionnaire based survey was conducted during September 2009 and October 2009. Questionnaire was distributed to students during class hours for each year with prior permission from Dean of the Institution.

**Ethical approval:** Ethical approval for conducting survey was obtained from the ethical committee of Narayana Dental College and Hospital.

**Participants:** A total of 369 undergraduate dental students registered with Dr. NTR University of Health Sciences, Andhra Pradesh, were approached to participate in the survey.

**Informed consent:** Verbal consent was obtained from the participants

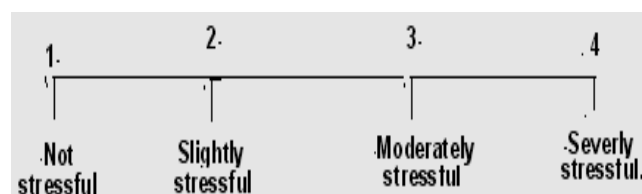
**Inclusion criteria:** All willing students who were present on the day of survey were included.

**Exclusion criteria:** Students who were absent on the day of survey were excluded.

#### Questionnaire design:

A modified version of the dental environment stress questionnaire was used to measure sources of stress. The questionnaire was modified to be applicable and suitable to younger Indian students, questions related to marital status and parenting were not included as it is very rare (illegal if married below 21 years for boys) for students in India to be married at this age and have a

family of their own. It consisted of two sections, in first section demographic characteristics like age; gender and year of study were included. Second section included 38 questions that related to possible sources of stress. Among the 38 questions, 24 related to both preclinical and clinical years and 14 related to clinical years (3<sup>rd</sup> and 4<sup>th</sup> years) were included. Questions related to clinical factors were administered to only the clinical students. Each stressor was rated on a four point Likert scale



#### Statistical analysis

Data analysis was performed by using SPSS-version 12 for windows. Mean scores and standard deviations were generated for each stressor. The t-test was used for independent samples to compare scores by gender. ANOVA was used to assess any differences on outcome measures of DES between the years of study. Post hoc analysis was performed with Scheffe test. Level of significance was set at 0.05

#### Results

A total of 343 of the 369 registered undergraduate students participated in the study with an overall response rate of 92.9%. (**Table I**).

Among 343 students, 167 (48.6%) were males and 176 (51.3%) were females. There was no significant statistical difference in gender distribution. Percentages of participation were 27.4%, 22.4%, 25.7% and 24.5% for first year, second year, third year and fourth year respectively.

Preclinical group consists of first year and second year students and constitute 171 (49.8%) students whereas third and fourth year students constitute clinical group and consists of 172 (50.1%) students. Among 171 preclinical students 86 (50.2%) were males and 85 (49.7%) were females and in clinical group (172) 81 (47%) were males and 91 (53%) were females.

Mean age of the total sample was 20.19 (1.5) years and ranged between 18.7 (0.88) for the first year students to 22.0(0.89) for the final year students. 32.9% of the respondents were aged above 20 years and the remaining 67.1% were aged 20 years and under (**Table I**).

Mean DES scores for each item were compared with all years of study (**Table II**). There was a statistically significant difference ( $p < 0.05$ ) between years of study for the lack of confidence to be a successful student, lack of confidence to be a successful dentist, fear of not having

Table 1: Demographic details, response rate and mean age of the sample

Year of study	N	%	Males		Females		Mean age
			n	%	N	%	
1st Year	94	27.4	50	53	44	47	18.7 (0.88)
2nd Year	77	22.4	36	46.7	41	53.3	19.6 (0.78)
3rd Year	88	25.7	42	47.7	46	52.3	22.0 (0.89)
4th Year	84	24.5	39	46.4	45	53.6	22.0 (0.89)
Total	343	100	167	48.6	176	51.4	20.19 (1.50)

possibility to pursue a post graduate dental education program, fear of failing year, difficulty in understanding lecture materials, fear of unable to catch up if getting behind the work, atmosphere created by clinical supervisors, rules and regulations of the dental faculty, shortage of allocated clinical time, difference in opinion between clinical staff concerning patient treatment, amount of work assigned, lack of time for relaxation, lack of time to do assigned college work, responsibilities of patient management, competition with peers for grades, examinations, relationship with opposite sex, accommodation is not suitable environment for studying, fear of unemployment after graduation, financial problems, personal health and availability of laboratory technicians. Overall third years were the most stressed followed by fourth years, second years and first years.

Mean DES score for each item were compared with gender (**Table III**). Statistically significant differences were found ( $p<0.05$ ) between males and females for fear of not having possibility to pursue a post graduate dental education programme, fear of failing year, difficulty in understanding lecture materials, approachability of teaching staff, attitude of faculty towards women dental students, full working day, lack of time for relaxation, lack of time to do assigned college work, late ending time, responsibilities of patient management, working on patients with dirty mouths, examinations and relationship with opposite sex.

**Ranking of stressors among the subjects studied:** Examinations were perceived to be the highest sources of stress by the total sample with a mean of 2.72 (1.12), followed by fear of unemployment after graduation 2.69 (1.04), fear of failing the year 2.39 (1.17), lack of time for relaxation 2.29 (1.05) and fear of unable to catch up if getting behind the work 2.28 (1.07)

**Ranking of stressors among males:** Examinations 2.73 (1.20) were perceived to be the highest stressor by males followed by fear of not having possibility to pursue a post-graduate dental education programme 2.51 (1.03), completing clinical requirements 2.50 (1.08), atmosphere created by clinical supervisors 2.49 (1.05) and responsibilities of patient management 2.48 (1.05).

**Ranking of stressors among females:** Examinations were perceived to be the highest sources of stress by females with a mean of 2.91 (1.02), followed by fear of not having possibility to pursue a post-graduate dental education programme 2.86 (0.99), completing clinical requirements 2.74 (1.05), late ending time 2.68 (0.98) and fear of unemployment after graduation 2.66 (1.02).

**Ranking of stressors among first year students:** Fear of failing the year was found to be the highest source of stress for first year students with a mean of 2.71 (1.25), followed by examinations with a mean of 2.61 (1.27), difficulty in learning skills required for laboratory work 2.32 (1.12), full working day 2.31 (1.07), fear of unemployment after graduation 2.31 (1.09).

**Ranking of stressors among second year students:**

Examination was perceived to be the highest stress provoking factor by the second year students with a mean of 3.05 (1.02), followed by fear of unemployment after graduation 2.84 (1.00), competition with peers for grades 2.49 (1.13), fear of failing year 2.40 (1.17) and full working day 2.36 (1.09).

**Ranking of stressors among third year students:** Fear of unemployment after graduation was perceived as highest stressor by the third year students with a mean of 2.84 (1.04), this was followed by examinations 2.75 (1.12), patients not attending or being late for appointments 2.71 (0.92), lack of time for relaxation 2.71 (0.99) and fear of not having possibility to pursue a post graduate dental education program 2.67 (1.07).

**Ranking of stressors among fourth year students:** Atmosphere created by the clinical supervisors was perceived to be highest stressor by fourth year students with a mean of 3.08 (0.76), followed by amount of work assigned 2.95 (0.82), Fear of unemployment after graduation 2.82 (0.97), completing clinical requirements 2.82 (1.01) and shortage of allocated clinical time 2.67 (0.93)

**Ranking of stressors in preclinical period of dental education:** When mean stress scores for preclinical students were evaluated, it was found that they were facing maximum stress about examinations 2.81 (1.18), followed by fear of failing the year 2.57 (1.22), fear of unemployment after graduation 2.55 (1.07), amount of cheating in dental faculty 2.34 (1.10) and full working day 2.33 (1.08)

Table 2: Mean DES Score of stress questions between different years of study

Sl.No.	Stress Questions	1st year (mean ± SD)	2nd year (mean ± SD)	3rd year (mean ± SD)	4th year (mean ± SD)	p value
1.	Lack of confidence to be a successful dental student	1.37 ± 0.76	1.75 ± 0.98	1.57 ± 0.94	2.21 ± 0.83	.000**
2.	Lack of confidence to be a successful dentist	2.02 ± 1.18	2.26 ± 1.09	2.51 ± 1.09	2.15 ± 0.85	.021*
3.	Completing clinical requirements			2.62 ± 0.99	2.82 ± 1.01	.176
4.	Fear of not having possibility to pursue a post graduate dental education programme			2.67 ± 1.07	2.58 ± 1.02	.020*
5.	Lack of confidence in clinical decision making			2.11 ± 0.76	2.34 ± 0.91	.145
6.	Fear of failing year	2.71 ± 1.25	2.40 ± 1.17	1.98 ± 1.17	2.45 ± 0.94	.000**
7.	Difficulty in understanding lecture materials	1.89 ± 1.07	1.75 ± 0.98	1.79 ± 1.05	2.21 ± 0.83	.013*
8.	Language barrier	1.48 ± 0.50	1.48 ± 0.50	1.45 ± 0.50	1.50 ± 0.50	.942
9.	Fear of unable to catch up if getting behind the work	2.01 ± 1.07	2.02 ± 0.91	2.18 ± 1.02	2.61 ± 0.87	.012*
10.	Atmosphere created by clinical supervisors			2.11 ± 0.87	3.08 ± 0.76	.000**
11.	Receiving criticism from supervisors about clinical work			2.27 ± 1.01	2.40 ± 1.06	.705
12.	Amount of cheating in dental faculty	2.31 ± 1.07	2.27 ± 1.02	2.10 ± 1.03	2.13 ± 0.84	.574
13.	Rules and regulations of the dental faculty	1.42 ± 0.72	2.20 ± 0.95	2.51 ± 1.10	2.55 ± 0.99	.000**
14.	Approachability of teaching staff	2.08 ± 1.00	1.96 ± 0.95	2.19 ± 1.15	2.10 ± 1.06	.564
15.	Expectation of dental faculty and what in reality it is like	1.85 ± 0.77	1.75 ± 0.98	1.9 ± 1.17	1.96 ± 0.75	.349
16.	Availability of supervisors in clinic			2.06 ± 0.93	2.13 ± 0.84	.521
17.	Attitudes of faculty towards women dental students	1.46 ± 0.50	1.46 ± 0.50	1.44 ± 0.49	1.50 ± 0.50	.907
18.	Shortage of allocated clinical time			1.94 ± 1.02	2.67 ± 0.93	.000**
19.	Differences in opinion between clinical staff concerning patient treatment			1.97 ± 0.78	2.54 ± 0.97	.000**
20.	Amount of work assigned	1.46 ± 0.72	2.27 ± 1.02	2.21 ± 0.99	2.95 ± 0.82	.000**
21.	Full working day	2.31 ± 1.07	2.36 ± 1.09	2.39 ± 1.01	2.45 ± 0.94	.855
22.	Lack of time for relaxation	1.63 ± 0.90	2.28 ± 1.04	2.71 ± 0.99	2.59 ± 0.94	.000**
23.	Lack of time to do assigned college work	2.02 ± 1.08	1.58 ± 1.06	2.10 ± 1.03	2.13 ± 0.84	.003*
24.	Late ending time	2.29 ± 1.07	2.32 ± 1.09	2.51 ± 1.09	2.59 ± 0.94	.282
25.	Difficulty of co-operation with patients			2.32 ± 0.95	2.45 ± 1.04	.123
26.	Responsibilities of patient management			2.03 ± 0.90	2.64 ± 0.96	.000**
27.	Patients not attending or being late for appointments			2.71 ± 0.92	2.50 ± 1.04	.122
28.	Working on patients with dirty mouths			2.23 ± 1.07	2.55 ± 1.04	.054
29.	Difficulty in learning clinical procedures			2.06 ± 0.93	2.13 ± 0.84	.521
30.	Difficulty in learning skills required for laboratory work	2.32 ± 1.12	2.36 ± 1.09	2.39 ± 1.01	2.38 ± 1.15	.979
31.	Competition with peers for grades	1.85 ± 0.77	2.49 ± 1.13	2.39 ± 1.01	2.51 ± 0.98	.000**
32.	Examinations	2.61 ± 1.27	3.05 ± 1.02	2.75 ± 1.12	2.52 ± 0.99	.000**
33.	Relationship with opposite sex	1.53 ± 0.92	2.25 ± 0.84	1.79 ± 1.05	2.38 ± 1.15	.000**
34.	Accommodation is not suitable environment for studying	1.54 ± 0.78	1.96 ± 0.95	2.30 ± 1.00	2.39 ± 0.80	.000**
35.	Fear of un-employment after graduation	2.31 ± 1.09	2.84 ± 1.00	2.84 ± 1.04	2.82 ± 0.97	.000**
36.	Financial problems	2.02 ± 1.18	2.36 ± 1.09	2.51 ± 1.09	2.15 ± 0.85	.021*
37.	Personal health (chronic diseases, drugs, others)	1.42 ± 0.49	1.49 ± 0.50	1.43 ± 0.52	1.52 ± 0.59	.000**
38.	Availability of laboratory technicians			2.13 ± 1.24	2.15 ± 0.85	.000**

\* p < 0.05 \*\* p < 0.001

Table 3: Mean DES Score of each stress questions between Males and Females of all Years

	STRESS QUESTIONS	Male (Mean $\pm$ SD)	Female (Mean $\pm$ SD)	p value
1.	Lack of confidence to be a successful dental student	1.78 $\pm$ .99	1.67 $\pm$ .85	.254
2.	Lack of confidence to be a successful dentist	2.13 $\pm$ 1.10	2.31 $\pm$ 1.06	.104
3.	Completing clinical requirements	2.50 $\pm$ 1.08	2.74 $\pm$ 1.05	.099
4.	Fear of not having possibility to pursue a post graduate dental education programme	2.51 $\pm$ 1.03	2.86 $\pm$ 0.99	.012
5.	Lack of confidence in clinical decision making	2.18 $\pm$ 0.90	2.18 $\pm$ 0.95	.967
6.	Fear of failing year	2.39 $\pm$ 1.21	2.13 $\pm$ 1.08	.024
7.	Difficulty in understanding lecture materials	2.03 $\pm$ 1.05	1.81 $\pm$ 0.95	.040
8.	Language barrier	1.52 $\pm$ 0.50	1.44 $\pm$ 0.49	.134
9.	Fear of unable to catch up if getting behind the work	2.11 $\pm$ 1.03	2.21 $\pm$ 1.03	.351
10.	Atmosphere created by clinical supervisors	2.49 $\pm$ 1.05	2.48 $\pm$ 0.94	.938
11.	Receiving criticism from supervisors about academic or clinical work	1.15 $\pm$ 0.12	1.00 $\pm$ 0.08	.971
12.	Amount of cheating in dental faculty	2.15 $\pm$ 1.07	2.23 $\pm$ 0.96	.391
13.	Rules and regulations of the dental faculty	2.36 $\pm$ 1.17	2.26 $\pm$ 1.07	.079
14.	Approachability of teaching staff	1.90 $\pm$ 1.00	2.24 $\pm$ 1.05	.003
15.	Expectation of dental faculty and what in reality it is like	1.95 $\pm$ 0.93	1.84 $\pm$ 0.93	.267
16.	Availability of supervisors in clinic	2.09 $\pm$ 0.95	2.16 $\pm$ 0.92	.586
17.	Attitudes of faculty towards women dental students	1.58 $\pm$ 0.49	1.37 $\pm$ 0.48	.000
18.	Shortage of allocated clinical time	2.30 $\pm$ 0.98	2.26 $\pm$ 1.08	.791
19.	Differences in opinion between clinical staff concerning patient treatment	2.22 $\pm$ 0.94	2.27 $\pm$ 0.93	.688
20.	Amount of work assigned	2.26 $\pm$ 1.14	2.23 $\pm$ 0.99	.752
21.	Full working day	2.11 $\pm$ 1.01	2.59 $\pm$ 0.99	.000
22.	Lack of time for relaxation	2.15 $\pm$ 1.04	2.37 $\pm$ 1.06	.037
23.	Lack of time to do assigned college work	2.11 $\pm$ 1.13	1.85 $\pm$ 0.98	.021
24.	Late ending time	2.14 $\pm$ 1.07	2.68 $\pm$ 0.98	.000
25.	Difficulty of co-operation with patients	2.16 $\pm$ 0.97	2.39 $\pm$ 0.98	.080
26.	Responsibilities of patient management	2.48 $\pm$ 1.05	2.18 $\pm$ 0.97	.032
27.	Patients not attending or being late for appointments	2.38 $\pm$ 1.05	2.64 $\pm$ 0.96	.063
28.	Working on patients with dirty mouths	2.24 $\pm$ 0.98	2.58 $\pm$ 1.16	.026
29.	Difficulty in learning clinical procedures	2.09 $\pm$ 0.95	2.16 $\pm$ 0.92	.586
30.	Difficulty in learning skills required for laboratory work	2.27 $\pm$ 1.08	2.43 $\pm$ 1.09	.178
31.	Competition with peers for grades	2.33 $\pm$ 0.96	2.21 $\pm$ 0.99	.211
32.	Examinations	2.73 $\pm$ 1.20	2.91 $\pm$ 1.02	.103
33.	Relationship with opposite sex	2.25 $\pm$ 1.23	1.78 $\pm$ 0.99	.000
34.	Accommodation is not suitable environment for studying	1.90 $\pm$ 0.91	1.97 $\pm$ 0.92	.449
35.	Fear of un-employment after graduation	2.31 $\pm$ 1.07	2.66 $\pm$ 1.02	.001
36.	Financial problems	2.13 $\pm$ 1.10	2.31 $\pm$ 1.06	.104
37.	Personal health (chronic diseases, drugs, ..others)	1.46 $\pm$ 0.56	1.57 $\pm$ 0.57	.071
38.	Availability of laboratory technicians	0.92 $\pm$ 1.26	1.19 $\pm$ 1.34	.061

\* p &lt; 0.05

\*\* p &lt; 0.001

**Ranking of stressors in clinical period of dental education:** When mean stress scores for clinical students were evaluated, it was found that they were facing maximum stress in fear of unemployment after graduation 2.83 (1.00), followed by completing their clinical requirements 2.72 (1.01), lack of time for relaxation 2.65 (0.96), examinations 2.63 (1.06), fear of not having possibility to pursue a post graduate dental education programme 2.62 (1.04) and patients not attending or being late for appointments 2.61 (0.98).

**Comparison of stress between preclinical and clinical years:** When mean stress scores were compared between clinical and preclinical years it was found that that students from clinical years reported high levels of stress 86.88 (16.6) than preclinical year students 48.5 (10.5).

## DISCUSSION

Stress has been described as a two-edged sword that can either stimulate and motivate the students to peak performance or reduce the students to ineffectiveness. Dental education includes considerable stress on students but it is difficult to eliminate all stressful factors in dental education programs.

Stress levels and perceived sources of stress among dental students were investigated by using various scales such as DES<sup>18</sup>, PGWB (Psychological General Well Being)<sup>19</sup> index, MBI (Maslach Burnout Inventory)<sup>20</sup>, and PSSI (Psychosocial Stress Inventory)<sup>20</sup> BSI (Brief Symptom Inventory)<sup>21</sup> in several reports. DES is used frequently among these scales. In this study, modified DES questionnaires were used to identify sources of stress

The main sources of stress among dental students have been investigated in several studies which were performed in different countries.

The most stress provoking factors in previous studies were found to be assigned workload, examinations, fear of failing course or year, unemployment, completion of clinical requirements and lack of time for relaxation<sup>1,4,6,18</sup>

In this study, examinations, fear of unemployment after graduation, fear of failing the year, lack of time for relaxation and fear of unable to catch up if getting behind the work were the most stress provoking factors respectively.

The highest stress provoking factor was found to be examination anxiety. This was in confirmation with previous studies<sup>12,16</sup> where examinations were amongst the most potent forms of stress in almost all the years. There was no statistically significant difference found between males and females in this stressor. However, females experienced slightly more stress than male counterparts. This finding was in contrary to that reported by Kumar S et al (2009) in which males perceived more stress when compared to females. When compared between years of study, there was statistically significant

difference between the various years with second year students perceiving more stress followed by third, first and fourth year students. Whereas in a study conducted by Kumar S et al (2009), third year students perceived examinations to be the highest sources of stress. Significant difference was found between second and fourth year of study.

Students were more insecure about employment after graduation. The reason may be due to the present trend of dental education in India where approximately 16,000 dentists pass out from 205 dental institutions each year. Even though the current oral health situation in India features huge unmet treatment needs, job opportunities are scanty as there is no oral health policy in India at the national level and in many states there are no dental services provided by the public health sector<sup>4</sup>. Consequently, job opportunities for fresh undergraduates are solely concentrated in the private sector where there is an increased competition that would limit their earnings. A statistically significant difference between males and females was found in respect to unemployment after graduation ( $p = 0.001$ ). This stressor is found to be statistically significant between first year students and remaining years ( $p < 0.05$ ) whereas it is not significant between second, third and fourth years.

Fear of failing the year was identified to be the third highest stressor in this study. Significant difference was found between males and females in respect to this stressor ( $p = 0.02$ ) with males reporting higher stress than female counterparts. Significant differences were also found between first and third year of study with first year students having highest stress about fear of failing the year ( $p=0.000$ ). This condition may be explained by first year students being unfamiliar with the academic environment, in accordance with results of Acharya S<sup>6</sup> et al (2003)

Lack of time for relaxation was one of the highest sources of stress reported in previous studies. In this study it was perceived as the fourth highest stressor by the students. Perception of stress related to this item gradually increased from first year to final year with a peak perception by the students of the third year. This may be due to the exposure of third year students to a greater clinical contact where they have to learn and practice the clinical procedures. Significant difference was observed between males and females with females perceiving more amount of stress.

Among students of this college fear of unable to catch up if getting behind the work was found to be an additional high stress provoking factor. It was perceived more stressful by the fourth year students when compared to the third year students. Stress related to this item showed a gradual increase from first year to final year. Final year students perceived high stress may be because of presence of more number of subjects in the final year and the university assigned number of minimum clinical cases

per subject to get qualified for exam. Though there was no significant difference between males and females in this stressor, females perception was more when compared to males. This was in accordance with previous studies<sup>12,17,19,22,23</sup>

In this study it was observed that students in the first year of BDS felt highest stress for fear of failing the year, while it was the third highest stress provoking factor for the first year students in the studies conducted by Zac Morse<sup>5</sup> et al (2007) and Kumar S<sup>4</sup> et al (2009) and fourth highest stress provoking factor for the same students in study conducted by Ilkay Peker<sup>8</sup> et al (2009). Examinations were the second highest stress provoking factors which was similar to Zac Morse<sup>5</sup> et al (2007) and Ilkay Peker<sup>8</sup> et al (2009). Difficulty in learning skills required for laboratory work was perceived as the third highest stress provoking factor in this study which was not so in other studies. However the mean score of 2.32 is very low when compared with studies from Turkey, Australia, USA and Jordan. Full working day was found to be the fourth highest stress provoking factor for these students which was similar to the studies conducted by Zac Morse<sup>5</sup> et al (2007) and Kumar S<sup>4</sup> et al (2009). In this study an interesting finding was that students from the first year perceived significant stress about fear of unemployment after graduation. This may be largely due to the fear created among them about future career by the senior students.

Second year students in this study perceived examinations as the highest stress provoking factors which was similar to the study conducted by S Kumar et al on Indian students while it was second highest in the study conducted by Zac Morse<sup>5</sup> et al (2007) in Fijian students. Fear of unemployment after graduation was perceived as the second highest stress provoking factor, while it was the first highest stress provoking factor for the second year students in the study conducted by Zac Morse<sup>5</sup> et al (2007). Competition with peers for grades was perceived as the third highest stress provoking factor which was similar to the study conducted by Kumar S<sup>4</sup> et al (2009) on Indian students. Fear of failing the year was perceived as the fourth highest stress provoking factor which was similar to the Fijian students while it was second highest stress provoking for second year students belonging to Turkey. Full working day was the fifth highest stress provoking factor in this study which was also the fifth highest for Fijian students while it was second highest in the study conducted by Kumar S<sup>4</sup> et al (2009) on Indian students.

Third year students in this study perceived fear of unemployment after graduation as the highest stress provoking factor while it was only one of the high stress provoking factors among the third year students of other studies. Examinations were the second highest stress factor for the third year students of this study which was similar to that reported by Ilkay Peker<sup>8</sup> et al (2009) among Turkey students and Kumar S<sup>4</sup> et al (2009) among Indian

students. Patient being late or not attending for appointments was perceived as the third highest stress provoking factor which was similar to that reported by Zac Morse<sup>5</sup> et al (2007) on Fijian students and Kumar S<sup>4</sup> et al (2009) among Indian students. Lack of time for relaxation was the fourth highest stress provoking factor for the students of this study which was similar to the other studies this may be explained by the increased clinical exposure to the third year students containing both clinical and lab work and also due to more number of subjects from this year. Fear of not having possibility to pursue post graduate dental education program was perceived as the fifth highest by the third year students of our study. This will reflect their fear about future career and professionalism.

Fourth year students of this study perceived the atmosphere created by clinical supervisors as the highest stress provoking factor which was the third highest in study conducted by Kumar S<sup>4</sup> et al (2009) on Indian students and Zac Morse<sup>5</sup> et al (2007) on Fijian students. Amount of assigned work was perceived as the second highest stress provoking factor by the fourth year students of this study which was similar to that reported by Zac Morse<sup>5</sup> et al (2007) on Fijian students and Ilkay Peker<sup>8</sup> et al (2009) on Turkey students. Fear of unemployment after graduation was perceived as the third highest stress provoking factor by the students of final year. This may be due to the scanty job opportunities both in public as well as private sectors. Completing clinical requirements was perceived as the fourth highest stress provoking factor by the fourth year students while it was the first highest stress provoking factor for the Turkey students. Shortage of allocated clinical time was perceived as the fifth highest stress provoking factor by the students in this study. This may be due to more number of subjects in the fourth year each having a definite number of clinical quota which the students have to fulfill for obtaining permission to university examinations.

Students in first and second years tended to have higher levels of stress when compared with later years on items related to academic performance like examinations and fear of failing the year supported by previous studies<sup>12,24,25</sup>.

Third and fourth year students reported particularly high levels of stress for unemployment after graduation and fear of not having possibility to pursue post graduate dental education programme, this may be possibly due to the fact that these are exit years for dental surgeons. This may be also due to the scanty job opportunities for the fresh undergraduates and little or no recruitment and heavy competition for the limited number of post graduate seats available in the country as well as in the state. They also expressed high levels of stress for items like completing clinical requirements, lack of time for relaxation and patients not attending or being late for appointments. These relatively high scores by clinical year students reflect the reality of the stressful nature of the dental

school environment. This is opposed to the findings which expressed that final year students, who should be more experienced, mature and have greater coping skills, express less stress.

There was a trend of increasing overall mean stress scores over the years with a peak in the third year which is the transition to a greater clinical contact and may represent a problem for many students. This finding is in accordance with previous studies<sup>4,5,7</sup> except one study in which first and second year students experienced more amount of stress than third and fourth years<sup>26</sup>. Others have found however that final year students show greater anxiety about the future<sup>6,7,21</sup>

The reconsideration of the existing educational system towards a more student-centered orientation could facilitate collaborative learning and interpersonal support amongst students, which may have a protective effect against difficulties faced whilst in a dental institution<sup>27</sup>

A broad spectrum of intervention studies has evaluated such programmes for dental students, including specific courses, stress-reduction sessions, introduction to behavioural sciences and faculty-incorporated advising systems. Howard<sup>28</sup> et al (1986) stated that although some professionals have viewed stress management interventions as band-aid techniques to the over-whelming problem of faculty-induced stress, such techniques do have a significant impact

It can be concluded that the primary sources of stress as perceived by the dental students were examinations, unemployment after graduation, fear of failing the year, lack of time for relaxation and fear of unable to catch up if getting behind the work so there is a need for the establishment of student advisors and counselors combined with a faculty advising system in addition to student-oriented programs in India. Dental schools should adopt strategies for stress management and provide resources to help reduce stress in dental education. Future research is recommended including larger population, to achieve a greater understanding of stress in dental education.

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#### Corresponding Author

**Sudhakar Kaipa**

G4 - Penna Apartment  
Mamata Hospital Campus  
Giriprasad Nagar  
Khammam

Phone: 919963368167

Email: [Drsudhakarmds@Gmail.Com](mailto:Drsudhakarmds@Gmail.Com)