



Journal Homepage: - www.journalijar.com
**INTERNATIONAL JOURNAL OF
 ADVANCED RESEARCH (IJAR)**

Article DOI: 10.21474/IJAR01/7444
 DOI URL: <http://dx.doi.org/10.21474/IJAR01/7444>



RESEARCH ARTICLE

DENTAL ENVIRONMENT STRESS, BURNOUT AND PERCEIVED HEALTH STATUS AMONG DENTAL STUDENTS.

Dr. Jyoti Bala¹, Dr. Rajkumar² and Dr. Varun Pratap Singh³.

1. Public Health Dentist, Private Practice, Dubai, UAE.
2. Specialist Orthodontist, Private Practice, Dubai, UAE.
3. Specialist Orthodontist, Alain International Medical Polyclinic, Alain, UAE.

Manuscript Info

Manuscript History

Received: 20 May 2018
 Final Accepted: 22 June 2018
 Published: July 2018

Keywords:-

Stress, Burnout, Physical health, mental health, Dental students..

Abstract

Objective: To assess the stress, burnout and health status of dental students and establish the correlation between these entities.

Methods: A total of 382 consenting dental students (III year & IV year undergraduate students, interns and the post graduate students) at Jaipur Dental College and Hospital, Jaipur participated in the study. They completed a Performa consisting of three components: The Modified Dental Environment Stress Questionnaire (DES), Maslach Burnout Inventory-General Survey (MBI-GS), and Short form 12 (SF-12) Health survey Questionnaire.

Results: 95.6 % of the participants responded. There were significant differences in the year of the study for DES mean scores, MBI-GS total scores ($P=0.003$ and $p < 0.001$) and health status. The perception of stress is also influenced by gender, as females are more stressed than males.

Conclusion: One side relation of stress and burnout and a reciprocal relationship of stress and burnout with health have been well understood by the study, but a causal relationship cannot be explained. Psychological stress and burnout in early years of profession are also predictive of occupational stress later.

Copy Right, IJAR, 2018,. All rights reserved.

Introduction:-

Stress is a feeling that's created when we react to particular events. It's the body's way of rising to a challenge and preparing to meet a tough situation with focus, strength, stamina, and heightened alertness. The events that provoke stress are called *stressors* and they cover a whole range of situations - everything from outright physical danger to making a class presentation or taking a semester's worth of your toughest subject. While it is also said that stress in moderation can stimulate one's faculties to delve deep into and discover one's true potential.

The profession of dentistry is considered to be extremely stressful. This is true for all stages of the dental career, that is for established dentists, young dentists and dental students^[1]. Dental schools are known to be highly demanding and stressful learning environments. Contemporary curricula require dental students to attain diverse proficiencies, including the acquisition of theoretical knowledge, clinical competencies, and interpersonal skills.^[2]

Corresponding Author:- Jyoti Bala.

Address:- Public Health Dentist, Private Practice, Dubai, UAE.

It has been reported that dental students express considerable stress symptoms during their training, and that they are more anxious than the general population, showing higher levels of depression, obsessive-compulsive disorders, and interpersonal sensitivity than age-matched norms.^[2] As a result of high demands and continuous occupational stress, professionals working with patients are at risk of developing a burnout syndrome.^[1] Burnout, a distinct psychological construct that has a number of features which separate it from occupational stress, is strongly associated with the emotional effects of providing patient or client services. Therefore, burnout can be observed in all manner of occupations (dentists, doctors, nurses, social workers, teachers etc.) in which patients or clients are provided with assistance, care or treatment.^[3] While occupational stress and burnout is well-recognized in qualified dentists, little is known about the influence of dental undergraduate and postgraduate training on the evolution of occupational stress and burnout in students^[4]. Stress and health are closely linked and even for burnout, the same relation holds good. It is well known that stress, either quick or constant, can induce risky body-mind disorders.

This has been well documented and the persistence of stress related symptoms may lead to mental and/ physical ill health, substance misuse, absenteeism and diminished efficiency at work or learning. These high numbers of physical complaints and alcohol abuse amongst dentists and dental students indicate that further investigations are necessary to gather more information on the health status of dental students and its effect on their long-term dental career.^[1]

However, the relationship between stress, burnout and health status of dental students has never been reported. Hence this study attempts to assess the stress, burnout and health status of dental students and establish the correlation between these psychological entities.

Materials and Methods:-

The study was carried out at a private dental college of Jaipur, Rajasthan, India, which is affiliated to a deemed university of Jaipur, Rajasthan, India. The dentistry curriculum at this dental college spans five years, of which the first two are the preclinical years, third and final pertain to clinical dental education and last is the rotatory internship program. And the post graduate programme is undertaken for a period of three years. This cross-sectional study was conducted on undergraduates in their third and final year including the interns and all the post graduate students. A total of 382 consenting dental students of this dental college were included in the study.

Prior consent and ethical clearance was obtained from the ethical committee of the institution before initiating the study. Every participant signed a consensus module and gave their consent prior to the start of the study. The participation of the subjects in the study was voluntary and anonymity was maintained. The survey period extended over a span of 40 days in the months of December 2012 and January 2013.

The required data was collected and recorded using printed Performa which consisted of two sections:

The I Section was specially developed to know the study subject's socio-demographic details including gender, residential address, contact details, year of study, department (for Post Graduates and interns), probable date / month of the coming examinations, mode of admission to the College, and duration of the training hours, marital status and number of children, dentistry as a career choice and personal habits viz. alcohol/ tobacco intake.

The Ii Section contained three components:-

Stress was assessed by the modified version of DENTAL ENVIRONMENT STRESS QUESTIONNAIRE (DES),^[2,4,5,6,7] which assesses the frequent sources of stress associated with dental students. It is a 31-item questionnaire based on a 4 point Likert scale, with scores ranging from 1 to 4 indicating the condition as 'not stressful' to 'severely stressful'. The items were sub-divided into categories as self-efficacy beliefs, faculty and administration, workload, patient treatment, clinical training, performance pressure and others. Example items include 'fear of failing the course or year', 'responsibilities for comprehensive patient care'. This instrument has a good reliability with an internal consistency of 0.93 as measured by Cronbach's alpha.

Burnout was assessed by revised MASLACH BURNOUT INVENTORY –GENERAL SURVEY (MBI-GS).^[8,9] The standard measure of burnout, Maslach Burnout Inventory - General Survey (MBI-GS; Maslach et al., 1996) was used.

MBI-GS is a 16 item questionnaire which assesses three aspects of burnout:

1. Emotional exhaustion (EX)5 items
2. Lack of professional efficacy (PE).....6 items
3. Cynicism (CY)5 items

The emotional exhaustion (EX) scale measures the depletion of emotional resources, as distinct from physical exhaustion or mental fatigue. Examples of items are "I feel emotionally drained from my work". The second scale Cynicism, (CY) measures the development of negative, cynical attitudes toward the recipients of one's services. e.g. "I feel less enthusiastic about working with patients". Finally, the Lack of professional efficacy (PE) scale measures the tendency to evaluate one's own work with recipients negatively. This lowered sense of efficacy has been linked to feelings of insufficiency and poor self-esteem e.g. "I can effectively solve my patients' problems".

Each statement is rated on a 7-point scale from 1 to 7 denoting the categories from Never to 5 times a week or more. Lower scores of professional efficacy and higher scores of Emotional exhaustion and Cynicism indicate higher burnout. The MBI-GS has been shown to have good reliability and validity in the measurement of burnout in dentists. The internal consistency scores assessed by Cronbach's alpha for revised MBI-GS are $\alpha = 0.89$ (Emotional exhaustion), $\alpha = 0.83$ (Lack of professional efficacy) and $\alpha = 0.81$ (Cynicism)^[8]

Health Status was assessed by Short-form-12 (SF -12)^[10,11,12] Health survey Questionnaire, Short version of SF-36 Health survey Questionnaire, which is frequently used internationally. It is a self-administrated questionnaire which takes 2 minutes or less to complete and records subjects' self-perceived physical and mental health status.

The two component scales of the SF-12 are:

1. **Physical Component Summary scores (PCS-12)** including Physical Functioning, Role Physical, or Bodily Pain scale,
2. **Mental Component Summary scores (MCS-12)** including Mental Health, Role Emotional, and Social Functioning scales,

SF-12 and its component scales are valid and can be used to measure the relationship between physical and mental health functioning and the social determinants of health.^[12]

The SF-12 has good internal consistency, reliability and construct validity. The test-retest reliability measures for the PCS-12 and MCS-12 are 0.890 and 0.774 respectively^[11].

A Professor in the Department of Psychiatry was consulted prior to the start of the study to take an advice about the survey instrument and to know whether it met the criteria for an adequate questionnaire. Then it was piloted on a total of 38 dental students from same institution randomly selected in equal numbers from all the classes to be included in the study who represented the entire study population. Pre-test evaluation was conducted to know the practical difficulties while conducting study, to check the average time of answering the questionnaire before the application to the students, to know the appropriateness of study design, questionnaire.

The survey data so obtained from the selected sample was compiled, systematized, tabulated and master table was prepared. The data was subjected to statistical analysis wherever required using inferential statistical techniques. The Statistical software namely SPSS 15.0 was used for the analysis of the data. Analysis of variance (ANOVA) and Student t-test (two tailed, independent) were used to find the significance of study parameters between socio-demographic characteristics. Pearson correlation has been used to find the correlation of burnout, stress and health status.

Computation Of Health Status:-

There were 12 items in the SF-12 questionnaire, out of 12 items 2 are five-point scale, 2 items were three-point scale 4 items were of two-point scale and remaining 4 items were of six-point scale. The maximum score in this questionnaire was 6; therefore, all the questions were translated in to 6-point scale by giving equal weights. The negative question/item was reversed to make it positive.

Results:-

The response rate was good (93.19%), 356 out of 382 enrolled dental students returned the completed questionnaires. Age distribution of the students was 19 years to 35 years and the mean age was 23.49 years. The gender split for the whole population was 34.8% and 65.2% males and females respectively. A total of 53% students reported that dentistry was their option as a career while almost equal numbers (46.91%) described it is not (Table 1).

III-year BDS students were found to be most stressed and also showed the highest levels of burnout while the poorest self-perceived health status was seen amongst the IV-year students. The house-surgeons enjoyed the best self-perceived physical and mental health status and also least burnout and stress levels. (Table 2)

An increasing trend of stress and burnout was present in the students whose first option of career was not dentistry especially in terms of the items pertaining to clinical training like difficulty in learning clinical procedures, shortage of allocated clinical time, getting an ideal case for the exam etc. And also they reported more physical and mental health problems than the ones who opted dentistry as their first choice as a career (Table 3). The unmarried student population was more stressed than their married colleagues, and also showed higher levels of burnout and a poorer self-perceived health status. (Table 3)

Splitting of the burnout values under its three components namely: **emotional exhaustion, lack of professional efficacy and cynicism** gave the following picture.

Females showed a significantly higher value of emotional exhaustion, while the remaining two component subscales were taken over by the male students. (Table 4) Comparing students in different years of the course, the III BDS students exhibited statistically significant highest values on all the three subscales of burnout, while the interns showed the least simulating their overall total burnout scores. (Table 4) When it was assessed in various departments, the Post Graduates of Department of Oral Pathology had the maximum emotional exhaustion, while the ones in Department of Orthodontics had the least ($p=0.002$). And lack of professional efficacy and cynicism were the highest in postgraduates of Departments of Conservative Dentistry and Pedodontic respectively. (Table 5) **The top five stressors** in this population were found to be in the order as follows:

Getting an ideal case for clinical exam was perceived stressful by 69.7% of students, Fully loaded day by 66.5%, Lack of time to do the assigned work by 62%, Examinations and scores by 60.9%, Fear of failing a course or a year by 60.6%, Fear of facing parents after failure by 58%

A Pearson correlation showed a significantly positive correlation between burnout levels and the DES scores ($p=0.026$) and at the same time a negative correlation between the burnout levels and DES scores with the health status ($p<0.001$ and $p=0.046$ respectively). (Table 6)

Table 1:-Gender split-up and distribution of career options of the study population

Gender	Number	%
✓ Male	124	34.8
✓ Female	232	65.2
1st option as a career		
✓ Dentistry	189	53.1
✓ Others	167	46.9
✓ Total	356	100.0

Table 2:-DES (Dental environment stress) mean scores, Burnout and Health status according to year of study

Parameter	III years	Final year	Interns	Post Graduates	P value
Stress	77.7±18.7	76.9±13.9	69.4±15.4	70.0±19.8	0.003**
A. Self –efficacy Beliefs	10.6±2.7	10.0±2.8	9.1±2.6	9.2±3.6	0.004*
B. Faculty and Administration	8.1±2.0	8.0±2.3	6.9±2.5	7.4±2.6	0.001**
C. Workload	11.4±2.9	12.0±3.0	10.2±3.0	10.7±3.4	0.037*

D. Patient treatment	12.7±3.4	11.9±3.5	11.0±3.8	11.7±3.9	<0.001**
E. Clinical training	13.5±3.5	13.4±3.3	11.8±3.1	11.4±3.8	0.001**
F. Performance pressure	8.7±2.1	8.0±2.4	7.6±2.5	7.3±2.8	0.068 ⁺
G. Others	14.5±4.3	13.5±4.5	12.8±4.0	13.2±4.2	0.001**
Burn out	52.5±12.8	49.3±14.0	42.8±13.5	45.3±15.4	<0.001**
Health status	50.77±8.46	50.31±8.65	57.02±7.59	55.15±9.31	<0.001**

⁺ weak statistical significant as p between 0.05 and 0.1

*statistically significant as P < 0.05

**statistically highly significant as P < 0.001

Analysis of Variance has been used to find the significance of study parameters between years of studying

Table 3:-Association of DES, Burnout and Health status with 1st option as a career, gender and marital status

Parameters	Dentistry	Others	P value
✓ Stress	73.13±18.69	74.59±15.87	0.430
✓ Burn out	47.02±14.89	48.53±13.85	0.326
✓ Health status	53.97±8.84	51.93±9.08	0.033*
	Male	Female	P value
✓ Stress	72.92±17.48	74.30±17.39	0.478
✓ BURN OUT	47.23±16.02	47.99±13.50	0.637
✓ Health status	54.33±8.69	52.29±9.09	0.042*
	Single	Married	P value
✓ Stress	74.47±17.19	68.95±18.46	0.054 ⁺
✓ BURN OUT	47.86±14.62	46.74±12.89	0.636
✓ Health status	52.88±9.13	53.94±7.97	0.477

⁺ weak statistical significant as p between 0.05 and 0.1

*statistically significant as P < 0.05

Analysis done using Student t test (two tailed, independent)

Table 4:-Mean pattern of components of burnout according to Gender and year of study

Gender	BURN OUT: components		
	Emotional Exhaustion	Lack of Professional Efficacy	Cynicism
Male	18.16±8.43	16.36±8.03	12.75±6.19
Female	20.03±7.99	15.71±6.99	12.25±5.44
Total	19.38±8.18	15.94±7.37	12.41±5.71
Significance	0.040*	0.427	0.470
Year of study	BURN OUT: components		
	Emotional Exhaustion	Lack of Professional Efficacy	Cynicism
III year	21.76±7.39	16.91±6.48	13.81±6.56
Final year	21.35±8.39	15.32±6.69	12.61±5.28
Interns	16.13±7.44	15.83±8.38	10.84±4.97
PG	17.37±7.96	15.84±8.07	12.06±5.63
Total	19.38±8.18	15.94±7.37	12.41±5.71
Significance	<0.001**	0.519	0.012*

*statistically significant as P < 0.05

**statistically highly significant as P < 0.001

Analysis done using Student t test

Table 5:-Mean Pattern of Burn out according to Department for PG students

Department	BURNOUT		
	Emotional Exhaustion	Lack of Professional	Cynicism

		Efficacy	
Oral Medicine, Diagnosis & Radiology	18.38±8.37	11.71±7.25	12.19±4.33
Oral & Maxillofacial surgery	14.94±7.74	13.63±7.61	10.94±6.79
Periodontics	21.24±8.15	15.41±7.05	11.12±4.99
Conservative dentistry & Endodontics	14.39±7.51	18.54±10.69	10.96±5.49
Preventive & Community Dentistry	14.63±5.69	15.70±7.58	10.96±4.78
Prosthodontics	16.33±7.89	17.05±7.76	12.38±5.71
Orthodontics	12.00±6.44	12.25±7.54	9.88±6.19
Paedodontics & Preventive Dentistry	19.82±7.72	18.18±6.95	13.24±6.61
Oral Pathology & Microbiology	23.00±4.00	18.38±5.99	11.75±2.92
Significance	F=3.198, P=0.002**	F=1.787, P=0.084	F=0.517, P=0.842

***statistically significant** as $P < 0.05$

****statistically highly significant** as $P < 0.001$

Analysis done using Analysis of variance

Table 6:-Correlation of Burnout, health status and stress

Pair	Pearson correlation coefficient (r)	P value
Stress vs Burnout	0.118	0.026 (moderately positive correlation)
Burnout vs Health status	-0.316	<0.001 (negative correlation)
Health status vs Stress	-0.106	0.046 (moderately negative correlation)

Analysis done using Pearson correlation

Discussion:-

The results of this study confirm that dental students experience considerable stress in the clinical period of dental education. The primary sources of stress for students in the dental college in question were getting an ideal case for clinical exam, Fully loaded day, Lack of time to do the assigned work, Examinations and scores, Fear of failing a course or a year and Fear of facing parents after failure which is consistent with the findings of a study on Greek dental students in whom assigned workload, performance pressure, and self-efficacy beliefs are the top most stressors.^[2] Identifying possible sources of stress may allow for their alleviation through changes in the curriculum, student and staff (academic and administrative) education, as well as providing resources such as counseling services to those who may require them.

Regarding the relationship of gender and perceived sources of stress, females reported higher stress in approximately all the aspects, in accordance with a number of other studies.^[2,5,6,7] Gender differences in most of the perceived stressors could be explained by their differing patterns of psychological morbidity and because male are simply less expressive of their concerns.

Furthermore, significant differences are observed in the stress levels in different years of study as third year BDS students are most stressed and the least are the house-surgeons. Burnout is a result of the interaction of particular characteristics with situational factors.^[13] The situational factors are comparatively less stressful for the house surgeons than the other classes thus they exhibited a significantly lesser stress and burnout.

The students residing in the college hostel or quarters exhibited a higher stress and a poorer health status in this study suggesting that the living conditions provided in the hostel are not up to the mark and also the students feel a lack of home atmosphere in the hostel, home sickness and lack of parental guidance and support which adds on to their stress and deprives them of the much required support. This favors the findings of Humphris et al^[4] where the

students who resided at home appeared to have some protection against stress, thus justifying the fact that the influence of a home situation appears to afford benefits to the student.

Another factor which was evaluated and correlated was the probable date of next exam. Not surprisingly the students who were about to appear for their university exams with two weeks of conduct of this investigation; experienced very high stress, burnout levels and also a poorer health status. Thus the examination undoubtedly accelerates the stress mechanism in the students which may also prove to be detrimental to their health. In spite of high stress scores the overall health scores are above the norm values i.e. mean of $50 \pm 10^{[10]}$ showing a good physical and mental health perception by the students which proves the fact that in moderation stress is normal and may not cause any devastating effects on the health.

Since admission to professional courses is largely on the basis of merit, the competition is intense, and many students may have to settle for an educational program (medicine, dentistry, pharmacy) that is not their first choice as a career. This adds on to the perceived stress of a student and in turn, the development of burnout, which is very well depicted by this study, as students with dentistry as their career choice showed significantly lower stress scores and burnout levels. The results are in accordance with a number of other studies^[5, 7] showing a significantly higher DES scores in those whose first career choice was not dentistry.

Burnout has been considered an important occupational hazard. The emotional exhaustion (EE) component of burnout had shown the most prevalence and the highest values in all the groups as compared to the other two components of the burnout syndrome. Female students showed a significantly higher value of emotional exhaustion, while the remaining two component subscales (cynicism, reduced professional efficacy) were taken over by the male students. It can be argued that females in occupations that require a relatively high educational background have to prove themselves more than their male colleagues. This may result in increased strain, and consequently increased burnout scores. It is also believed that men hide their emotions and attitudes, whereas women are more emotionally expressive, and tend to reveal their emotions and problems more easily.

Professional burnout, a long-term consequence of occupational stress, is considered to be a factor that explains a substantial proportion of incapacity for work. Ignoring the risk of burnout may have serious negative implications for the dentist personally, the patient, the quality of work, and the professional image in general.^[14]

Engagement has been defined as the opposite of burnout. As burnout is the negative pole of a continuum, with engagement representing the positive antipode. Analogous to burnout, work engagement encompasses three subscales: Vigor, dedication and absorption. Vigor (VI) is characterized by the high levels of energy and mental resilience while working and by the willingness and ability to invest effort in one's work. Dedication (DED) is characterized by a sense of significance, enthusiasm, inspiration, pride and challenge. Final scale absorption (AB), is characterized by being fully concentrated and happily engrossed in one's work.^[15]

As expected, the students with a high risk for burnout report health complaints to greater extent than the ones with a low burnout risk. A challenge in the burnout research is the validation of self-report with more objective measures. To do so, one needs to understand more about the relationship between burnout and objectively measurable phenomena such as physiological reactions. The future research can be aimed at linking these psychological entities with biochemical parameters. This would not only contribute to the knowledge of the burnout concept, but would also enlarge our understanding of the relation between burnout and health.

References:-

1. K. Poehlmann, I. Jonas, S. Ruf and W. Harzer. Stress, burnout and health in the clinical period of dental education. *Eur J Dent Educ* 2005; 9: 78– 84.
2. Argy Polychronopoulou and Kimon Divaris. Perceived Sources of Stress among Greek Dental Students. *Journal of Dental Education* 2005; 69(6): 687-92.
3. Humphris Gerry. A review of burnout in dentists. *Dental Update* 1998, 392-96.
4. Gerry Humphris, Andy Blinkhorn *et al*, Psychological stress in undergraduate dental students: baseline results from seven European dental schools. *Eur J Dent Educ* 2002; 6: 22– 29.
5. Acharya Shashidhar. Factors Affecting Stress among Indian Dental Students. *Journal of Dental Education* 2003; 67(10): 1140-48.
6. Rahul S. Naidu, Jerry S. Adams, Donald Simeon, Suzette Persad. Sources of Stress and Psychological Disturbance among Dental Students in the West Indies. *Journal of Dental Education* 2002; 66(9): 1021-30.
7. G. Sugiura, K. Shinada, Y. Kawaguchi. Psychological well-being and perceptions of stress amongst Japanese dental students, *Eur J Dent Educ* 2005; 9: 17– 25.
8. Rosalind c. Barnett, Robert T. Brennan, Karen C. Gareis. A Closer Look at the Measurement of Burnout. *Journal of Applied Biobehavioral Research*, 1999; 4(2): 65-78.
9. Christina Maslach, Susan E. Jackson, Michael P. Leiter. *Maslach Burnout Inventory Third Edition, Evaluating Stress A Book of Resources* 1997; 191-218.
10. Crispin Jenkinson, Richard Layte, Damian Jenkinson, *et al*. A shorter form health survey: can the SF-12 replicate results from the SF-36 in longitudinal studies? *Journal of Public Health Medicine* 1997; 19 (2): 179-184.
11. Ware John E. Jr., Kosinski Mark, Keller Susan D., A 12-Item Short-Form Health Survey: Construction of Scales and Preliminary Tests of Reliability and Validity. *Med care*, 1996; 34(3): 220-233.
12. James N. Burdine, Michael R.J. Felix, Amy Llewellyn Abel, *et al*. The SF-12 as a Population Health Measure: An Exploratory Examination of Potential for Application. *HSR: Health Services Research* 2000; 35(4):885-904.
13. Adelson Richard. Professional burnout and the operative dentist. *Journal of Dental Education* 1984; 48(2): 98-101.
14. Gorter RC, Albrecht G, Hoogstraten J, Eijkman MAJ, Professional burnout among Dutch dentists. *Community Dent Oral Epidemiol* 1999; 27:109-16.
15. Te Brake H., Bowman A.M. *et al*. Professional burnout and work engagement among dentists. *Eur J Oral Sci* 2007; 115: 180-85.