

## ARTICLE

## Perceived Stress and Burnout among Medical Students during the Clinical Period of Their Education

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### Abstract

**Background:** Transition from pre-clinical to clinical training has been identified as a crucial stage of medical education regarding student stress. When entering the clinical environs, students may become more prone to burnout. **Aims:** This study aimed to determine the prevalence, sources and predictors of high stress levels and burnout among medical students at King Faisal University, Saudi Arabia, during the clinical phase of medical education. **Subjects and Methods:** A cross-sectional survey of medical students in years four through six at Al-Ahsa Medical College during the academic year 2011-12 was performed. All 324 regular course attendants were invited to participate in the study and 233 participated (response rate of 71.9%). A self-reported questionnaire was used which covered three categories, including 18 sources of stress. Short Perceived Stress Scale and Emotional Exhaustion Subscale of Maslach Burnout Inventory were used to measure stress and burnout. **Result:** Sixth year students were more likely to cite relationship, hospital,

and professional issues as stressors. Top stressors cited by final year students were concern about the future, defective clinical practice skills, fear of harming patients, and high parental expectations. Whereas first year students cited stressors such as transportation problems to hospital, fear of infection, and time limitations for training. The prevalence of emotional exhaustion and high levels of perceived stress was 76.8 and 71.7% respectively. Year of study was the only single independent risk factor for burnout and high levels of stress among students of clinical years. **Conclusions:** Clinical phase of medical education is a necessary area of intervention in order to provide an improved transition between pre-clinical and clinical periods. In addition, adoption of a new curriculum that integrates pre-clinical and clinical training of students from an early stage of education may reduce the stress.

**Key word:** Saudi Arabia, medical students, clinical period, perceived stress, emotional exhaustion.

## Introduction

Medical schools have unique stressors beyond those of university education (1,2). Tertiary medical training has always been regarded as highly stressful (3-7). Stressful moments in the academic life of medical students have been described, and medical training is considered to have high psychological toxicity (8). High levels of stress may have a negative effect on both cognitive functioning and comprehension of medical students (3). Medical training stressors may also have associated negative consequences on the mental and physical health of medical students (3-7). This may impact not only the personal distress of the individual doctor but it might affect patient care (9). Stress can reach burnout levels (10).

In Arabic countries, data about psychological morbidity among medical students is limited. Some studies suggested high rates of depression and anxiety (11,12). Egyptian and Saudi medical students have almost the same rates of high stress, though anxiety and depression were significantly higher among the Egyptian students. Satisfactory family income and having a college-educated father were independent protective factors in both groups (13). In Saudi Arabia, medical school consists typically of one pre-medical course, then five years of the study of medicine, and one internship year (14). The curriculum is traditional starting with pre-clinical studies followed by clinical courses (9,14). Transition from pre-clinical to clinical training, and from introductory clinical cycle to clerkship cycle, has been identified as a crucial stage of medical school since it is when students in traditional curriculums begin to grasp the image of their future profession (9). However, students' stress increases (15) when entering the clinical environs. Students may become more inclined to experience burnout and compassion fatigue (16,17). Clinical period presents another occasion for intense anxiety, uncertainty, expectations, and fear caused by feelings of limitations regarding scientific knowledge. Transitions from one stage to another, and direct contact with seriously ill people who have poor prognoses, likely to contribute. Excessive workload and educational content, combined with high levels of educational demands, a lack of leisure time, limited contact with family and friends, choosing a specialty, and delayed income may also contribute to medical students' stress (1,8). In addition, personality traits inherent to medical students, including obsessiveness, perfectionism and self-exigency, may also factor in (8,9). The clinical period of medical education opens up additional challenges such as studying away from home, living up to high parental expectations,

completing degree requirements, and preparing for exams (19). Medical students have been shown to experience depression, lack of sleep, disengagement, exhaustion, worry about the future, and financial concerns (20).

In many medical schools, the environment itself presents an all-prevailing pressure situation. Students face an authoritarian, rigid system that encourages competition rather than cooperation among learners (21). It is not just the undergraduate study period which brings stress, but this often continues during the internship, postgraduate study period, and even later into the physician's practical life (22). Some studies have reported deterioration in students' mental health as courses progress (23). Burnout often increases as students enter more advanced subjects (2,15). Another study found a higher prevalence of burnout in the introductory clinical cycle (8). One study conducted at King Saud University, Saudi Arabia, reported that the level of stress progressively decreased as year of study increased, except for the final year (21). Some stress in medical school training is arguably necessary for learning. Stress that facilitates learning is called "favorable stress" while stress that suppresses learning is called "unfavourable stress" However, students may perceive the same stressors differently depending on cultural backgrounds, personal traits, experience and coping skills (24).

In the present study, we aimed to determine the prevalence, sources, and predictors of high stress levels and burnout among Saudi medical students at Al-Ahsa Medical College during the clinical period. Understanding of these factors may help with planning measures to reduce perceived stress and burnout.

## Subjects and Methods

### *Setting and Design*

The study was approved by Al-Ahsa Medical College. Verbal consent was obtained. This was a cross-sectional survey of medical students in clinical training of medical education (fourth, fifth, and sixth years) at Al-Ahsa Medical College, King Faisal University, Saudi Arabia, academic year 2011-12. Completed questionnaires were collected one month before the second term examination period to minimize any associated stress symptoms. At Al-Ahsa Medical College, clinical training in undergraduate medical courses is three years (fourth to sixth year), and consists of clinical training along with didactic courses. Incomplete questionnaires were excluded. A total of 233 (123 male, 110 female) completed questionnaires were analyzed, there were 93 fourth

year (43 male, 50 female), 139 fifth year (77 male, 62 female) and 105 sixth year (60 male, 45 female), a total of 337 students collectively. All students were approached to participate in this research. Questionnaires were distributed to 324 regular course attendants. 233 complete questionnaires were received (response rate, 71.9%). Non-participation was due to lack of interest, absence, or incomplete questionnaires.

### ***Survey instruments***

Students were given a pack of four instruments in English. The first enquired about socio-demographic data, the second evaluated stressors primarily related to or affected by the period of the clinical training. In the third, perceived stress levels were measured by Cohen's Perceived Stress Scale. The fourth was the emotional exhaustion subscale of Maslach Burnout Inventory Scale. The potential stressors included in the questionnaire were derived from review of the literature, and by informal discussions with students. Students were asked to enumerate potential sources of stress faced and found most stressful during their clinical training. Finally, 18 sources of stress were listed and grouped as relationship (four items), hospital (five items) and professional issues (nine items). Both a psychiatrist and psychologist working independently completed the categorization of stressors. The raters agreed upon 85% of the categorizations. Stress was measured by a previously validated short four-item perceived stress scale derived from questions 2, 4, 5 and 10 of the Perceived Stress Scale (10 item, PSS). Cronbach's coefficient of internal consistency was reported to be 0.85, and test-retest reliability during a short retest interval (several days) was 0.85 (26). Perceived Stress Scale is the most widely cited psychological instrument used to measure an individual's level of perceived stress. The scale does not tie appraisal to a particular situation. It is sensitive to the non-occurrence of event as well as to ongoing life circumstances. The stress score was stratified into no, mild, moderate (merged as low level) stress or severe (high level) stress according to first, second, and third quartiles. Respondents who expressed high levels of stress were the only ones displayed. The level of burnout was measured by the subscale of emotional exhaustion. This subscale provides a quantified measure of burnout (27). Burnout is a concept that consists of three dimensions: emotional exhaustion, depersonalization, and lack of personal accomplishment (28). Practically, the use of the subscale of emotional exhaustion alone (nine items) appears to be a valid measure of professional burnout (29, 30). The student is asked to answer each item on a scale of

occurrence from 0 (never) to 6 (every day). A score <17 is below burnout, 18-29 was moderate level of burnout, and values >30 indicated high levels of burnout (31). Respondents who expressed high levels of burnout are the only persons focused.

### ***Data Analysis***

Data were analyzed using SPSS (Statistical Package for Social Science, version 11, SPSS Software, SPSS Inc., Chicago, USA). In quantitative data, a student t-test for independent sample and One Way ANOVA were used for group comparisons. In categorical data, Chi-squared test was used for comparison between groups. Significant factors predicting high levels of stress and burnout on univariate analysis were entered into multivariate logistic regression analysis to find the independent predictors of stress and burnout. Odds ratio and 95% confidence interval were calculated.  $P \leq 0.05$  was considered statistically significant.

### ***Results***

#### ***Students Demographics***

Medical students were distributed in the three years (57, 79, 97 in fourth, fifth, and sixth years respectively). Age ranged from 20-25 years with a mean of  $23.3 \pm 1.0$ . Males represented 52.8% of the sample and 67.4% were from urban areas. Family income was reported to be unsatisfactory in 30.9% of students. The majority of students were single (81.5%) and subsequently 83.3% lived with their family during study (Table 1).

#### ***Perceived Stress and Burnout Level***

The majority of students reported one or more stressors, and there was a significant difference between the three academic levels in number of stressors ( $P < 0.000$ ). In comparison, although, students belonging to the final year of clinical period were more likely to cite relationship, hospital, and professional problems than were the others, stressors that were most troublesome were worry about the future, and defective clinical practice skills (77.3% for each), followed by fear of harming patients (74.2%), and high parental expectations (71.1%). The top items for fifth year students were lack of feedback (75.9%), followed by shortage of hospital time and capacity (49.4% and 48.1% respectively). For those in the fourth year, transportation problems to and from hospital (86.0%), followed by fear of infection (84.2%), and time limitation for training (77.2%) were the most frequently mentioned stressors (Table 2). During the clinical period of medical study, high levels of stress were prevalent among 71.7% of all students, while

burnout was diagnosed in 76.8% (Table 3).

### **Determinants of Stress and Burnout**

There was a statistical association between educational level, burnout, and perceived high stress in this study. Increased prevalence of high stress (82.5%) and emotional exhaustion (88.7%) were significantly noted among students in final year of clinical training (sixth year students) as opposed to other students. Univariate analysis revealed that final year of clinical course (sixth year) was the only single significant predictor for burnout among students (OR=4.6). For PSS, univariate analysis showed that high levels of stress were reported by sixth year students with increased numbers of stressors. However the stepwise logistic regression analysis revealed that the former was the only single significant independent predictor (OR=3.2) of high levels of stress (Tables 4, 5).

### **Discussion**

Most medical students look forward to the clinical phase of their training, however, it can be a stress-producing process (31). The difference between the two periods can be linked to numerous factors such as physical environment, context, curriculum, educational methods, training atmosphere, stu-

dents' and teachers' roles, relations etc. Also, during clinical training, students often spend considerable time without specific assignments, waiting for a physician/teacher to arrive at the ward to teach and supervise. Students' desire to learn and to be useful might turn into frustration and impulsivity. Students might be apt to react (9). So, it is important to specify the situations connected to this increased stress and burnout among students, and the potential stressors behind this. Such information can make an important contribution to the preparedness of both new students and teachers for clinical training.

We found differences in the nature of top stressors reported by students in the beginning year compared to the last year of clinical phase. While the top sources of stress in fourth year students were transportation problems to and from hospital, followed by fear of infection, and time limitation for training, top stressors reported by sixth year students were very different. Sixth year students cited worry about the future and defective clinical practice skills, followed by fear of harming patients, and high parental expectations. Our study revealed that most of the top stressors of the starting year of clinical course (fourth year) lie in the domain of hospital-related stressors, while those belonging to

**Table 1.** Some socio-demographic characteristics of medical students registered in study years of clinical training

Characteristics	N=233	%
Gender:		
-Male	123	52.8
-Female	110	47.2
Academic level of clinical course:		
-4 <sup>th</sup> year	57	24.5
-5 <sup>th</sup> year	79	33.9
-6 <sup>th</sup> year	97	41.6
Marital status:		
-Single	190	81.5
-Married	43	18.5
Family residence:		
-Urban	157	67.4
-Rural	76	32.6
Student accommodation:		
-With the family	194	83.3
-Away from the family	39	16.7
Family income:		
-Satisfactory	161	69.1
-Unsatisfactory	72	30.9

<b>Table 2.</b> Source of stress as reported by students enrolled in clinical years of medical education according to their academic level				
	Academic level			p-value
	4 <sup>th</sup> Grade n (%)	5 <sup>th</sup> Grade n (%)	6 <sup>th</sup> Grade n (%)	
Number of stressors Min – Max X±SD	3-17 9±3.0	1-16 6.75±3.4	2-17 9.64±3.3	=0.000
<b>Frequency Individual Stressors*</b>				
Relationship problems:	39(68.4)	50(63.3)	93(95.9)	=0.000
Problems with the opposite gender	16(28.1)	30(38.0)	39(40.2)	=0.302
Competition with course mates	21(36.8)	26(32.9)	55(56.7)	=0.003
Problems with faculties	20(35.1)	22(27.8)	60(61.9)	=0.000
High parental expectation	14(24.6)	8(10.1)	69(71.1)	=0.000
Hospital problems:	49(86.0)	64(81.0)	89(91.8)	=0.111
Shortage and unstable hospital time	34(59.6)	39(49.4)	54(55.7)	=0.472
Incompatible hospital capacity with students number	33(57.9)	38(48.1)	67(69.1)	=0.018
Inability to socialize with hospital environment	25(43.9)	16(20.3)	36(37.1)	=0.008
Fear of becoming infected	48(84.2)	31(39.2)	39(40.2)	=0.000
Transportation problems to and from hospital	49(86.0)	15(19.0)	48(49.5)	=0.000
Professional problems:	48(84.2)	67(84.8)	85(87.6)	=0.799
Personal illness or injury affect clinical performances	24(42.1)	37(46.8)	60(61.9)	=0.032
Time limitation for training	44(77.2)	30(38.0)	17(17.5)	=0.000
Fear of hurting patient	30(52.6)	34(43.0)	72(74.2)	=0.000
Clinical skills practice is not enough	32(56.1)	35(44.3)	75(77.3)	=0.000
Difficulties of case taking and presentation	32(56.1)	33(41.8)	48(49.5)	=0.246
Lack of feedback	27(47.4)	60(75.9)	46(47.4)	=0.000
Inability to answer patients questions	16(28.1)	33 (41.8)	30(30.9)	=0.180
Verbal or physical abuse by hospital staff	22(38.6)	17(21.5)	46(47.4)	=0.002
Worry about the future career	24(42.1)	30(38.0)	75(77.3)	=0.000
<i>*Categories are not mutually exclusive; Chi-square test is used to compare group; One-way ANOVA is used to compare number of stressors</i>				

**Table 3.** High levels of stress and burnout (emotional exhaustion) among studied medical students

	Total (N=233)	Academic level of clinical course			Significance
	Overall	4 <sup>th</sup> year n=57	5 <sup>th</sup> year n=79	6 <sup>th</sup> year n=97	
High stress level	167(71.7%)	34(59.6%)	53(67.1%)	80(82.5%)	0.005
Emotional exhaustion	179(76.8%)	36 (63.2%)	57(72.2%)	86(88.7%)	0.001

**Table 4.** Univariate analysis of predictors of burnout and high level of stress among total students

Predictor	Burnout	p-value	OR (95% CI)	High stress	p-value	OR (95% CI)
Educational level: -4 <sup>th</sup> year -5 <sup>th</sup> year -6 <sup>th</sup> year	36 (63.2) 57(72.2) 86(88.7)	=0.3 <0.000	1(r)* 1.5(0.7-3.3) 4.6(1.9-11.4)	34(59.6) 53(67.1) 80(82.5)	=0.4 =0.002	1(r)* 1.4(0.6-2.97) 3.2(1.4-7.2)
Gender: -male -female	96(78.0) 83(75.5)	=0.6	1(r)* 0.9(0.5-1.7)	89(72.4) 78(70.9)	=0.8	1(r)* 0.9(0.5-1.7)
Marital status: -Single -Married	142(74.7) 37(86.0)	=0.1	1(r)* 2.1(0.8-6.4)	134 (70.5) 33(76.7)	=0.4	1(r)* 1.4(0.6-3.2)
Family residence: -Urban -Rural	126(80.3) 53(69.7)	=0.07	1(r)* 0.6(0.3-1.1)	117(74.5) 50(65.8)	=0.2	1(r)* 0.7(0.4-1.2)
Student accommodation: -With the family -Away from the family	145(74.7) 34(87.2)	=0.09	1(r)* 2.3(0.8-7.9)	135(69.6) 32(82.1)	=0.1	1(r)* 2.0(0.8-5.7)
Family income: -Satisfactory -Unsatisfactory	123(76.4) 56(77.8)	=0.8	1(r)* 1.1(0.5-2.2)	115(71.4) 52(72.2)	=0.9	1(r)* 1.04(0.5-2.02)
Number of stressors** (continuous)	8.7±3.5	=0.2	-1.7 to 0.4	8.8±3.4	=0.03	-2.07 to -0.08

\*(r): reference group; \*\*independent sample t-test

**Table 5.** Logistic regression analysis of significant independent predictors of high level of stress among total students

Predictor	B	P-value	OR (95% CI)
Final year of clinical period (6 <sup>th</sup> year)	1.2	=0.002	3.2(1.5-6.7)
Number of stressors (continuous)	0.09	=0.1	1.1(1.0-1.2)
Constant Model $X^2$ % correctly predicted	10.7 P=0.005 71.7		

the final year of clinical period (sixth year) represented the domain of professional issues. We noted a significant difference regarding the number of stressors in both samples. The difference in main stressors in our results could be explained by the fact that fourth year represents a transition from pre-clinical to clinical teaching, where students often struggle to manage their time, and apply for reliable transportation to and from hospital according to the new phase requirements. Furthermore, they lack knowledge and practice regarding infection control measures.

In this study, the sixth year represented the final year, where students have more contact with patients, so they experienced more stress about a possible lack of proper training and skills that could lead to possible harming of patients and subsequent fear of litigation. Additionally, final year students are approaching graduation and they may face more stress related to future career and high parental expectations. Giving a wrong treatment, arriving at a wrong diagnosis, carrying out cardiopulmonary resuscitation, inadvertently harming patients, and becoming infected were recently reported to be the leading sources of stress and anxiety among students starting clinical studies (32). An earlier study suggested that talking to psychiatric patients, effects on personal life, presenting cases, and dealing with death and suffering were found to be stressful events among medical students during their clinical studies (33). Issues related to health and dying were common universal stressors reported by students in health care professions (34).

The transition from pre-clinical to clinical training has been identified as a crucial stage of medical school regarding student stress. This is likely when students in "traditional" medical schools begin to grasp an image of their future profession (9). In this study, the prevalence of high stress levels and emotional exhaustion among students of clinical phase is much higher than has been previously reported in

other studies of medical students in different grades and/or in pre-clinical period in particular (5,13,21,35). Additionally, an interesting finding of the present study was that the prevalence of high stress and burnout increased as the year of study progressed, whereas high stress level and burnout as expressed by emotional exhaustion were significantly higher in sixth year, followed by fifth year students, rather than fourth year. This was surprising because we assumed that the final year of clinical period is generally less stressful since students had become more acclimatized with clinical life and were able to adjust to different stressors. They likely had been able to develop coping mechanisms by that time. The higher rates of stress and burnout in our study could be explained by the cross-sectional nature of the study. This design was used to ensure that the stress and emotional exhaustion were really increasing in the study subjects. Burnout, which is perceived as denoting particular work-related adverse reactions, may be considered a measure of distress induced from study (9). Also, our findings of increased stress and emotional exhaustion among final clinical year students in comparison to other students may attributable to several factors including greater fear of not achieving the goal of becoming a doctor and the excessive load of clinical subjects in this year. An alternative explanation could be that the students may face increased parental expectations and competition for postgraduate training posts. Our results concur with those of Pau and Croucher who found that clinical British dental students (third and fourth year) had higher levels of stress than pre-clinical students (37). It is also in agreement with previous work showing that level of stress increased progressively during the course, reaching its peak by the end of the clinical training period (38). However, our findings are at variance with other studies that found level of stress decreased as year of study progressed (22,38). Predictably, the present study showed a significant increase in burnout with an increase of higher levels of PSS. Attempts must be made to alleviate

this high level of stress to prevent burnout. A number of stressors and final level of clinical period were significant determinants for high level of PSS but the latter was only listed for emotional exhaustion. No significant influence of gender, marital status, family residence, student accommodation and family income was detected on the prevalence of burnout and high stress levels in our study. However, regression analysis suggested that study year was the only single independent risk factor of burnout and high level of stress among students. Students belonging to final year of clinical phase were more likely to be highly stressed and emotionally exhausted than others by 3-5 fold respectively. These findings support the conclusion of a recent reported that year of study was the only significant factor affecting stress among medical students.

The cross-sectional design based on self-reported information provided by students may be a limitation of the study. Reporting bias may have resulted from the respondents' interpretation of the questions, or desire to report their emotions in a certain way, or simply because of inaccuracies of responses. In addition, the study took place at only one college, which may limit the generalization of the results.

In conclusion, higher rates of emotional exhaustion and severe stress were evident among medical students in years of clinical period, and these rates increased with progressing years of study. These findings are a cause of concern; they may adversely affect students' behavior, diminish their learning and ultimately affect future patients' care. Furthermore, medical students experiencing burnout are less likely to altruistic views about physicians' responsibility to society. Results of this study can be used to focus on clinical years as a window of opportunity to provide an improved, less anxious, transition between pre-clinical and clinical phases.

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