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PREVALENCE OF STRESS AMONG MEDICAL STUDENTS IN JEDDAH, SAUDI ARABIA.

Surgery

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ABSTRACT

Purpose: Education can be very stressful, and medical practice has been described as one of the most stressful professions. Undergraduate medical students have demonstrated high stress levels, which is becoming a serious concern the aim was to determine the prevalence of perceived stress among medical students at King Abdulaziz University, and to assess the association of the stress levels with different academic and socio-demographic variables.

Methods: This cross-sectional survey targeted medical students attending King Abdulaziz University (KAU) in January 2016 using the Arabic version of the Perceived Stress Scale–10 (PSS-10) questionnaire.

Results: Six hundred thirty medical students were included, of whom (51.1%) were females. The overall prevalences for *High perceived Stress* and *Average perceived Stress* were (56.6%) and (42.9%), respectively. Second-year students reported the highest mean perceived stress score of (22.34±5.1, P=0.004), and female students had a higher mean perceived stress score than male students (21.85± 4.7 vs 20.19± 5.2, P=0.001). The use of public transportation was associated with higher perceived stress levels, particularly among female students (P=0.027). No difference in stress levels was detected according to different GPAs.

Conclusion: perceived stress is very common among medical students, and especially females. More support such as orientation workshops and counselling services is needed to help students to promote their psychological well-being.

KEYWORDS

Medical students, perceived stress, Grade Point Average (GPA), Psychological Health

Introduction

Education may impose serious pressure on students and place them in a stressful environment [1]. This can alter students' social behaviours and health and presents a considerable challenge for academic administrations. Globally, medicine is recognized as one of the most stressful professions [2], and the escalating stress facing undergraduate medical students is becoming a concern [3-5]. Medical students are exposed to long-term stress in their pursuit of better performance [6], but this stress can be accompanied by undesirable effects on their physical and mental health. Consequently, the students' educational process, their relationships with colleagues, and in the future, their care for patients, are also negatively affected [7].

From a global perspective, the prevalence of stress among medical students at three British universities was (31.2%) [8], while it reached (41.9%) at a Malaysian university in 2002 and even (61.4%) at a university in Thailand in 2003 [7-9]. A study in Sweden reported lower levels of depression (12.9%) among their medical students, but (2.7%) of those students attempted suicide [4]. Although an association is expected between the clinical years and stress levels, a study in the United Kingdom showed that stress levels were higher during the first years of medical college and decreased as students proceeded to their clinical years, unlike another cohort in Pakistan, which demonstrated the opposite [3,10].

Although many studies worldwide have assessed perceived stress among medical students [3-5], studies in Saudi Arabia remain limited [11-13]. A local study revealed that the overall prevalence of stress in one sample was (71.7%) and that the prevalence of severe stress was (18.3%). The latter study emphasized the importance of workshops for medical students focusing on stress management techniques and the need to investigate the effect of academic, socio-demographic and psychosocial variables on students' stress levels [6]. In fact, studies have shown that stress may have a different impact on males than females [13,14] and have described some socio-demographic variables as major stressors with evident negative implications on students. One Indian study confirmed the latter and described the serious effects of similar variables, including gender, hostility, study environment, transportation, and time needed to reach one's school, on students' health [15].

These potential risk factors could be used to compare stress scores among medical students and to understand how stress influences their academic performance. Very few studies have measured the association between stress and socio-demographic variables among undergraduate medical students in Saudi Arabia. It is important for medical educators to understand the magnitude of this problem and determine the causes of stress among their students. The aim was to determine the prevalence of perceived stress among medical students at King Abdulaziz University, and to assess the association of the stress levels with different academic and socio-demographic variables.

Methods

1- Participants

This cross-sectional study targeted male and female medical students studying at King Abdulaziz University (KAU), one of the largest universities in Saudi Arabia, in January 2016. The curriculum of the faculty of medicine at KAU is a six-year programme, in which the 1st

year (pre-med) is an orientation, the 2nd and 3rd years focus on pre-clinical sciences, and the 4th, 5th and 6th years are the clinical years. During the latter years, students attend lectures, clinical rounds, clinical sessions, and surgical procedures. During this phase, medical students are not expected to care for patients or to be on-call to cover emergency cases as these duties are beyond their capacity. To enhance the scope of this study and for better representation of different phases, we targeted second-, fourth- and sixth-year students, and we aimed to include a randomly selected sample covering 50% of the total students registered in all three batches. Ethical approval was obtained from KAU's Ethical and Technical Committee.

2- Survey instruments

After reviewing the literature, we constructed a self-administered two-part questionnaire. The first part focused on the students' characteristics, namely, socio-demographic and academic data including gender, marital status, history of chronic illness, place of residence and whether the students lived with their parents/families, parents' relationship, high school type (public, private or international), means of transportation to the faculty, and current academic batch and GPA. For the second part, which focused on assessing stress levels, we adopted the Perceived Stress Scale (PSS-10) questionnaire. The PSS-10 questionnaire was developed by (Cohen S and Williamson G1988), and it is the most widely used tool for measuring an individual's stress level. The PSS-10 was selected for its improved internal reliability and factor structure compared with other versions of the PSS [16]. The scale comprises 10 items capturing emotional and cognitive responses to certain circumstances in the respondents' lives over the past month. Each item is rated on a 5-point scale ranging from (0)=never to (4)=almost always. Items 4, 5, 7 and 8 are reverse scored and then all ratings are summed. The maximum score on the scale is 40, with higher scores indicating higher levels of perceived stress [16,17]. To determine the prevalence of stress, the scores were classified into three categories: low stress (PSS score 0-7), average stress (PSS score 8-20) and high stress (PSS score 21 and over) [16]. This cut-off point for high stress has been used in other studies [6,18]. Different studies have confirmed the validity and reliability of the PSS-10 as a suitable instrument for measuring perceived stress among Arabic individuals [19,20]. Data collection was conducted one month before exams so exam stress would not affect the students' responses. Participation was voluntary, and the students responded privately and on their own time. Informed consent was obtained from each participant. The students' academic performance was estimated using the students' GPA. GPA was analysed as an independent variable in this study, and it was principally self-reported by the students themselves. GPA was classified into the following five categories: ($\leq$2.5 – 2.99), (3.0 -3.49), (3.5 – 3.99), (4.0 – 4.49) and ($\geq$4.5).

3- Data analysis

For Statistics analysis we used "IBM SPSS Statistics, Version 21.0 (IBM Corporation, Armonk, NY)".

For the descriptive analysis, categorical variables are presented as counts and percentages, and continuous variables are presented as means and standard deviations. The mean and standard deviation of the total PSS scores was also calculated. The independent t-test and one-way analysis of variance were used to test the differences in stress scores among the medical students and according to their demographic characteristics. The chi-square test was used to identify factors that were significantly associated with stress. The results were considered significant at a (P-value $\leq$0.05).

Results

A total of 630 medical students participated in the study. The students had a mean age of (21.49 ±1.9) years, with males and females constituting (48.9%) and (51.1%) respectively. Approximately (32.7%) of the students were in their second year, (33%) were in their fourth year, and sixth-year students represented (34.3%) of the total participants. The students' demographic and academic data (with their mean stress scores) are presented in Table 1. The overall prevalence rates of perceived stress among the medical students in this study were (56.6%) for high stress, (42.9%) for average stress and (0.5%) for low stress.

Regarding gender differences, the female students reported significantly higher mean stress scores than the male students (21.85) vs (20.19, P=0.001), as shown in (Table 1). Moreover, this study identified statistically significant differences between the stress levels of medical students' in different academic years, showing that the second-year students exhibited higher stress (22.34) than the fourth-year (21.13) and sixth-year (20.71) students (P=0.004). In comparison, marital status was associated with significantly lower stress levels (P=0.047), suggesting that married students are under less stress than single students. Students who used public transportation to commute to the university had a higher mean stress score (22.68) than those who used private transportation (20.89, P=0.013; Table 1). Additionally, the mean stress scores were higher among female students who used public transportation to commute (23.05) than among those who used private transportation (21.99, P=0.027). However, the male students showed no differences in stress scores in relation to the type of transportation they used (Table 2). Other socio-demographic and academic variables, such as having a chronic illness, residence, living with parents, parents' relationship, high school type and current GPA, also had no effect on the students' stress levels (Table 1).

Discussion

This survey estimated the prevalence of stress among medical students attending KAU, where (56%) of the sample reported high stress and approximately (42%) reported average stress. In general, the female students showed higher mean stress scores than the males, and the highest mean stress levels were reported among second-year students.

The prevalence of stress among medical students has been reported in a few local studies. A study by Alsaggaf [21] focused on another population of students in Jeddah and revealed that approximately (65%) of clinical medical students were experiencing high stress. However, that study had a smaller sample size than the current study, and its focused on the quality of the students' sleep. Additionally, two recent studies focusing on similar groups reported (63.8%) and (71.9%) prevalences of stress, respectively [13,22]. Furthermore, a very recent survey conducted among pre-clinical medical students at Umm Al-Qura University, just a few kilometres from our study location, reported a (70%) stress prevalence for that group [23], and even regionally, researchers found that the prevalence of stress among Egyptian medical students was (30.9%) [19].

In our study, the mean stress scores for medical students were highest among second-year students; this finding was similar to a study conducted in Al-Riyadh (13). Early in their academic life, students are abruptly separated from family and friends and must adapt to a demanding new learning environment. Moreover, as Arabic is the dominant language in Saudi Arabia, an English-based learning environment may create an obstacle for junior students and can lead to a need to spend more hours studying, which adds to the students' stress. Canadian studies have noted that mental health worsens and remains poor as students enter and progress through medical school [20]. In comparison, stress among the fourth-year students could be due to many factors, including the transition from basic science (pre-clinical) subjects to clinical training, the different educational environment with a disrupted schedule, and other difficulties they may face when dealing with sick patients. A study at McGill University agrees with our findings and suggests that the transition to the clinical training years is associated with an increase in stress and depressed mood [24]. A well-organized transition process is required to avoid similar issues. In our study, the sixth- and last-year medical students showed the lowest stress scores, probably because they are better able to adapt to their surroundings, study environment and educational demands.

While some studies have detected no gender-related differences in stress levels [11,25], in this sample, the female students showed consistently higher stress levels compared with their male counterparts, and this result is consistent with the findings of other studies in Saudi Arabia [8,13]. Females are more likely to report their concerns and may sometimes tend to exaggerate symptoms [24]. As women are prohibited from driving in Saudi Arabia, we believe the mode of transportation to the university may have affected the female students' stress scores. In fact, the use of public transportation for commuting was associated with higher stress for all students, particularly for females. Another notable finding of this study was that being married significantly decreased stress levels for both genders. Married couples can motivate and support one another, which can increase their confidence and generally relieve stress. However, the sample of married students in the present study was not large enough to represent a wider population.

Different studies have shown different impacts of stress on academic

performance, and some have found a significant correlation between stress and academic performance [26]. Interestingly, our study found no association between stress levels and students' academic performance, as determined by their GPAs. This result was consistent with the findings of other studies conducted in Saudi Arabia [13,23]. However, and in consideration of the above findings, many medical colleges have launched programmes to effectively reduce the negative effects of stress on the health and possibly the performance of medical students [27,28]. The use of similar stress reduction methods by the faculty of medicine at KAU is much needed, bearing in mind that a reasonable amount of stress is also necessary to motivate students and to encourage optimal performance [13].

We believe this study is the first to investigate the effects of socio-demographic and academic characteristics on stress levels among both pre-clinical and clinical medical students in Saudi Arabia. Another strength of this study is its large sample size as we included more than 50% of the medical students studying at KAU. However, this study have some limitation, first the self-reported nature of the questionnaire may have over-estimated some facets of this assessment. Therefore, a cohort study is needed to accurately evaluate stress levels among medical students during all six years of their training and to explore other variables, such as having a relative in a medical field, the family's financial status and the student's residential location. Perceived stress may vary significantly over time; that is why only one PSS-10 application would have some methodological limitations. Finally, students' personality traits not assessed in this study, could be a determining factor in stress levels.

Conclusion

The study revealed a high prevalence of high perceived stress among medical students at King Abdulaziz University. Females and second-year students reported significantly higher perceived stress scores. GPA was not associated with perceived stress. It is necessary to initiate programmes focusing on the mental and psychological well-being of students, especially among juniors.

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Table 1. Student characteristics and the differences in mean perceived stress scores

Variables	N	%	Mean stress score	P-value
Gender				
Male	308	48.9%	20.19± 5.2	0.001
Female	322	51.1%	21.85± 4.7	
Academic year				
Second	206	32.7%	22.34±5.11	0.004
Fourth	208	33.0%	21.13±4.84	
Sixth	216	34.3%	20.71±5.50	
Marital status				
Single	608	96.5%	21.11±5.02	0.047
Married	22	3.5%	18.95±4.55	
Do you have a chronic illness?				
Yes	48	7.6%	21.5±4.61	0.507
No	582	92.4%	21.0±5.05	
Residence				
Private	588	93.3%	20.97±5.03	0.177
Public (university-owned)	42	6.7%	22.05±4.71	
Do you live with your parents/family?				
Yes	525	83.3%	21.10±5.05	0.456
No	105	16.7%	20.70±4.86	
Parents relationship				
Married (still together)	555	88.1%	21.08±5.02	0.955
Divorced	30	4.8%	20.37±5.51	
Separated	25	4.0%	21.24±4.62	
Father dead	7	1.1%	20.71±6.50	
Mother dead	13	2.1%	20.77±4.25	
Transportation				
Private	577	91.6%	20.89±5.12	0.013
Public	53	8.4%	22.68±3.33	
School				
Private	203	32.2%	20.59±5.36	0.055
Public	404	64.1%	21.14±4.77	
International school	23	3.7%	23.13±5.76	
GPA				
2.5 to 2.99	7	1.1%	19.57±9.34	0.437
3.0 to 3.49	34	5.4%	21.24±6.09	
3.5 to 3.99	82	13.0%	20.13±4.94	
4.0 to 4.49	186	29.5%	21.19±5.05	
4.5 and above	321	51.0%	21.19±4.77	

Data are presented as the mean±standard deviation.
N: number

Table 2. Stress score according to the type of transportation among male and female students

Transportation	N	Mean±SD	P-value
Male			
Private	299	20.58±5.40	0.866
Public	9	20.89±3.48	
Female			
Private	278	21.99±5.16	0.027
Public	44	23.05±3.21	

Data are presented as the mean±standard deviation. N: number

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