

Prevalence and correlates of university students' perceived stress in southwestern Saudi Arabia

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Abstract

The university period can be stressful for most students. It may be due to exposure to various stressors. Objectives: To establish the prevalence and factors associated with high perceived stress among university undergraduates in south-western Saudi Arabia.

A self-administered survey was conducted among a representative sample of King Khalid University students through a cross-sectional study. Data obtained included socio-economic, academic characteristics, and grade point average (GPA) scores. Stress was assessed using the Perceived Stress Scale.

This study included 2467 students. The average Perceived Stress Scale score was 19.13 ± 6.56 , which was notably higher ($P = .02$) among health care undergraduates (19.45 ± 6.49) compared to others (18.85 ± 6.61). High perceived stress prevalence rate was 12.7% (13.6% in health care institutions and 12.0% in non-healthcare institutions). Multivariable analysis revealed that high perceived stress was considerably greater among females (adjusted odds ratio [aOR] = 2.35, 95% confidence interval: 1.67–3.30), smokers (aOR = 1.65), those with an unsatisfactory income (aOR = 3.10), and healthcare students (aOR = 1.33). In contrast, it was negatively associated with the GPA score (aOR = 0.77).

High perceived stress is a substantial problem among university students. Female students and healthcare students are at a greater risk. High stress is correlated with smoking, lower GPA scores, and perceived insufficient family income.

Abbreviations: 95% CI = 95% confidence interval, aOR = adjusted odds ratio, GPA = Grade Point Average, KKU = King Khalid University, PSS = Perceived Stress Scale.

Keywords: academic performance, health and non-healthcare colleges, perceived stress, smoking, University students

Editor: Massimo Tusconi.

All relevant data are within the paper and its Supporting Information files. However, access to the study data can be provided by request to authors.

The authors have no funding and conflicts of interest to disclose.

The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

All data generated or analyzed during this study are included in this published article [and its supplementary information files].

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How to cite this article: Alsaleem MA, Alsaleem SA, Shehri SA, Awadalla NJ, Mirdad TM, Abbag FI, Mahfouz AA. Prevalence and correlates of university students' perceived stress in southwestern Saudi Arabia. *Medicine* 2021;100:38 (e27295).

Received: 1 May 2021 / Received in final form: 11 August 2021 / Accepted: 1 September 2021

<http://dx.doi.org/10.1097/MD.00000000000027295>

1. Introduction

Stress is a state of inadequacy between our needs and our capability and offers of our environments and demands from us.^[1] The university period could be stressful for most students. It may be due to exposure to various stressors. These include separation from family support, high personal expectations, time urgency, academic overload, examinations, competitions, attempting to achieve educational goals despite financial limitations, and lack of leisure time activities.^[2]

The prevalence rate of high perceived stress varies widely between different universities due to differences in the magnitude of university environment stressors, tools used in measurement, and target colleges.^[3,4] Students in health care colleges could be at a greater risk of stress than those in other colleges. This may be due to exposure to a higher load of academic, social, and financial stressors.^[5,6]

An acceptable level of stress could be a motivation for productivity and good performance. However, a high level that exceeds the personal capability to cope could be harmful. It may negatively impact physical and psychological well-being.^[2,7] Stress among university students may also be associated with risky behaviors, including smoking and drug abuse.^[8] Furthermore, it is correlated with low academic achievement.^[9]

The objectives of the present study were to establish the prevalence and factors associated with high perceived stress among university undergraduates in south-western Saudi Arabia.

2. Materials and methods

2.1. Study design

A cross-sectional survey was conducted among male and female students at King Khalid University (KKU) during the academic year 2017-2018.

2.2. Target population and study setting

Undergraduates in health and non-healthcare colleges in KKU were the target population for the present study. KKU is situated in the Aseer region in south-western Saudi Arabia. The seer region population amounted to more than 1.6 million persons. The university encompasses five healthcare colleges and 24 non-healthcare colleges. The total number of male and female students in the academic year 2014 to 2015 was 60,312.

2.3. Sample size and sampling method

The sample size was calculated using Epi Info program version 7.2. The calculation was based on an anticipated occurrence of high perceived stress among university undergraduates of 33.8%,^[3] 95% confidence level, and an acceptable margin of error of 3%. The estimated sample size was 912 undergraduate students. To consider the possibility of non-response, 1100 undergraduates were targeted at each health and non-healthcare college.

All health care colleges in KKU were involved in the study; namely, colleges of dentistry, nursing, applied medical science, pharmacy, and medicine. Four non-healthcare colleges were chosen using a random method. They were colleges of languages and translation, science, administrative and financial sciences, and education. The students included in the study were selected using the stratified cluster random sampling technique. In each college, students were stratified by academic level. For each level, a cluster (study section group) was selected. All listed undergraduates in each set were involved in the survey whenever possible. Inclusion criteria were students present at the university campus during the survey. Exclusion criteria were those who were not willing to participate in the study.

2.4. Study measures

A self-administered questionnaire was disseminated personally between the participants by medical students as part of their community medicine course teaching. The questionnaire comprises the following elements: a) personal data such as age, sex, marital status, smoking status, and family income; b) academic data, which include academic level, name of college, and grade point average (GPA) score; c) the Arabic version of Cohen's Perceived Stress Scale (PSS)^[10] which has been translated and validated by a previous study.^[11]

2.5. Data collection and ethical issues

Before data collection, written approvals were taken from the designated colleges' authorities to perform the study in the setting. The medical students (data collectors) presented themselves to the participants at each level, notified them about the study objectives, and guaranteed data anonymity and confidentiality. Participation in the study was voluntary. The authors state that the study was conducted according to the

ethical codes of the relevant national and institutional committees on human research and the Helsinki Declaration of 1975, as revised in 2008. KKU Ethical Committee approved the study. Informed consent was taken from participants.

All incomplete questionnaires were eliminated. The response rate was 87% in healthcare colleges and 92% in non-healthcare colleges. The reasons for non-response were lack of time and interest.

2.6. Data analysis

Data were entered, double-checked, and analyzed using the Statistical Package for the Social Sciences version 22 software package. The grading of PSS into low, moderate, and high PSS was based on Cohen et al.^[10]. Using univariate and multivariable logistic regression analyses, the crude odds ratio and adjusted odds ratio (aOR) were estimated. The 95% confidence intervals (95% CIs) were used to identify significant factors associated with stress among university students. Statistical significance was set at $P < .05$.

3. Results

The current study was conducted among 2467 students (overall response rate of 91.37%) affiliated with King Khalid University's nine colleges. A total of 1342 students (54.4%) were selected from four non-healthcare colleges. These colleges include the college of languages and translation (313 12.9%), science (336, 13.6%), administrative and financial sciences (338, 13.7%), and Education (355, 14.4%). The study also included 1125 students (45.6%) from five healthcare colleges. These were colleges of dentistry (155, 6.3%), nursing (164, 6.5%), applied medical science (220, 8.9%), pharmacy (243, 9.8%), and medicine (343, 13.9%). The participants' ages ranged from 18-to-36 years, with an average age of 21.58 ± 1.60 years. The distribution of students was proportional across the different academic levels of KKU colleges. Of the 2467 participants, 1353 (54.8%) were women.

In contrast to students in health care colleges, non-healthcare colleges contained more students with younger (≤ 20 years) age (32.1% vs. 20.9%), males (55.1% vs. 33.2%), married (7.2% vs. 4.8%), with unsatisfactory family income (8.6% vs. 3.5%), smokers (15.4% vs. 9.5%), and ex-smokers (9.2% vs. 4.2%), students in 1st to 6th academic levels (68.0% vs. 44.7%), and with GPA ≤ 4.1 vs. 1.8%). Hence, the two groups of students were unmatched concerning these personal and academic criteria (Table 1).

The average PSS score of university students was 19.13 (SD=6.56). Overall, the prevalence of severe perceived stress was 12.7%. High perceived stress was 13.6% in healthcare colleges and 12.0% in non-healthcare colleges. The average PSS score of health care students (19.45 ± 6.49) was significantly higher ($P = .02$) than that of non-healthcare students (18.85 ± 6.61).

Table 2 shows that the univariate and multivariable analysis of factors associated with high perceived stress. Multivariable analysis revealed that high perceived stress was significantly higher among female university students (aOR=2.35, 95% CI:1.67–3.30) than male students. Similarly, the following factors were found significantly associated with high perceived stress: being ex-smoker (aOR=1.63, 95% CI:1.04–2.56) or current smoker (aOR= 1.65, 95% CI: 1.01–2.77), perceiving unsatisfactory family income (aOR=3.10, 95% CI:1.94–4.89) and

Table 1
Characteristics of health and non-healthcare university students (n=2467).

Factors	Total N = 2467 n (%)	Health care colleges N = 1125 n (%)	Non- health care colleges N = 1342 n (%)	P-value
Age (yr)				
≤20	666 (27.0)	235 (20.9)	431 (32.1)	.001
+ 20	1801 (911)	890 (79.1)	911 (67.9)	
Sex				
Male	1114 (45.2)	474 (33.2)	740 (55.1)	.001
Female	1353 (54.8)	751 (66.8)	602 (44.9)	
Marital status				
Married	150 (6.1)	54 (4.8)	96 (7.2)	.01
Single	2317 (93.9)	1071 (95.2)	1246 (92.8)	
Smoking status				
Never smoker	1983 (80.4)	971 (86.3)	1012 (75.4)	.001
Ex-smoker	170 (6.9)	47 (4.2)	123 (9.2)	
Current smoker	314 (12.7)	107 (9.5)	207 (15.4)	
Family income				
Satisfactory	2313 (93.8)	1086 (96.5)	1227 (91.4)	.001
Unsatisfactory	154 (6.2)	39 (3.5)	115 (8.6)	
Academic level				
1–6	1416 (57.4)	503 (44.7)	913 (68.0)	.001
7–12	1051 (42.6)	622 (55.3)	429 (32.0)	
GPA score †				
≤ 2.5	62 (3.1)	15 (1.8)	47 (4.1)	.004
+ 2.5	1911 (96.9)	808 (98.2)	1103 (95.9)	

P-value= Chi square test P value, GPA Grade point average.

† = missed data for 604 students.

Table 2
Univariate and multivariable analysis of academic and personal factors associated with high perceived stress among study university students (n=2467).

Factors	Total n (%)	High perceived stress n (%)	cOR (95%CI)	aOR (95%CI)
Overall	2467 (100)	314 (12.7)	–	–
Age (yr)				
≤20	666	96 (14.4)	Ref	Ref
+ 20	1801	218 (12.1)	0.82 (0.631–1.06)	0.85 (0.60–1.21)
Sex				
Male	1114	100 (9.0)	Ref	Ref
Female	1353	214 (15.8)	1.90 (1.48–2.45)	2.35 (1.67–3.30)
Marital status				
Married	150	22 (14.7)	Ref	Ref
Single	2317	292 (12.6)	0.84 (0.52–1.34)	0.98 (0.56- 1.72)
Smoking status				
Never smoker	1983	244 (12.3)	Ref	Ref
Ex-smoker	170	23 (13.5)	1.255 (0.89–1.76)	1.63 (1.04–2.56)
Current smoker	314	47 (15.0)	1.11 (0.70–1.76)	1.65 (1.01–2.77)
Family income				
Satisfactory	2313	272 (11.8)	Ref	Ref
Unsatisfactory	154	42 (27.3)	2.81 (1.93–4.10)	3.10 (1.94–4.89)
College				
Non- health colleges	1342	161 (12.0)	Ref	Ref
Health colleges	1125	153 (13.6)	0.87 (0.86–1.10)	1.33 (1.01–1.77)
Academic level				
1–6	1416	188 (13.3)	Ref	Ref
7–12	1051	126 (12.0)	0.89 (0.70 – 1.13)	1.01 (0.72 – 1.40)
GPA score †				
≤ 2.5	62	12 (19.4)	Ref	0.77 (0.62–0.96)‡
+ 2.5	1911	232 (12.1)	0.57 (0.30–1.10)	

GPA Grade point average.

† = missed data for 604 students, 95%CI= 95% confidence interval, ref = reference group, cOR= crude odds ratio, aOR=adjusted odds ratio.

‡ entered into the model as a continuous variable.

belonging to health care colleges (aOR=1.33, 95% CI:1.01–1.77). High perceived stress was negatively associated with GPA score, which was used as a proxy of academic performance (aOR=0.77, 95% CI:0.62–0.96). No significant relations were detected between high stress and participants' age, marital status, and academic level.

4. Discussion

The present study observed high perceived stress among 12.7% of university students in south-western Saudi Arabia. The literature reports varying rates of high stress among university students. A recent systematic review noted that the prevalence rate ranged widely from 14.3% to 56%.^[4] Cultural differences may explain the differences.

The average students' PSS in the current study was 19.13 ± 6.56 (19.45 and 18.85 for health and non-health care colleges, respectively). Our findings were similar to those reported among university students in India (19.2),^[12] Nigeria (19.6),^[13] and Iran (20.04)^[14] and slightly higher than those reported in France (15.9),^[8] the USA (16.0),^[15] Romania (17.3)^[16] and England (17.9).^[17] The average score was markedly lower than that reported in universities in other regions of Saudi Arabia, including Jeddah (28.5)^[18] and Riyadh (27.0).^[19] It is also remarkably lower than that reported in Malaysia (27.5).^[20] The wide variation in stress level could be related to the difference in stress study design being used in different populations and the differences in the magnitude of personal, family, academic, financial, and university environment stressors.^[4,20]

According to our results, female students are exposed to a higher risk of perceived stress than males. This was reported by several studies conducted among university students in Saudi Arabia,^[21] Malaysia,^[22] Turkey,^[23] Lebanon,^[24] the UK,^[17] and the USA.^[25] The reason for the excess risk in female students is unclear. Although studies have found that female students do not have higher academic stressors than male students, they may perceive challenging and adverse events as more stressful than males.^[26,27] Another study suggests that socially, male expression of emotions may be considered a symbol of weakness and low masculinity.^[28]

The positive association between perceived stress and smoking in the present study confirms previous studies.^[4,8] There is some evidence that stress may contribute to behavioral problems such as smoking and drug abuse.^[8] Smokers believed that smoking helps cope with stressful events at university by brief social relations during the study day, non-verbal expression of distress, and stress relief.^[29] Students' tobacco smoking in response to stress can lead to a greater risk of lifetime nicotine addiction.^[8]

The association between the higher risk of high perceived stress and students' perception of insufficient family income observed in our study follows the findings of a previous study.^[2] University time may be sufficiently stressful for students attempting to achieve academic goals despite their financial inadequacies.^[9]

The higher risk of high perceived stress observed in the present study among health care students compared to students in other colleges is following previous reports.^[4–6,20,30] Earlier studies found that healthcare students, particularly medical students, are exposed to more frequent stressors, including too many examinations, time urgency, shortage of leisure time, academic pressure, and work overload.^[5,6,31]

In the current study, high perceived stress was negatively associated with the GPA score, used as a proxy for academic

performance. A reasonable stress level is positive and helpful in making the student more energetic and a better performer. On the other hand, high-stress levels may negatively impact students' physical and psychological wellbeing, leading to low academic achievement.^[2,7]

The present study has several strengths. It included a large and representative sample of university students in south-western Saudi Arabia. It is also the first study to compare health and non-healthcare students regarding perceived stress. It could provide a deep insight into the relationship between high perceived stress and smoking, low academic achievement, and perceived insufficient family income.

However, this study had some limitations. First, the data were obtained using a self-administered questionnaire that may be affected by recall bias. Due to the study's cross-sectional nature, it was difficult to confirm the direction of the relationship between stress and other associated factors, such as smoking and GPA scores. Moreover, unevaluated factors could affect perceived stress at the time of the study, such as other academic, social, economic, and cultural criteria. The missing data for GPA in some instances was another limitation.

5. Conclusion

High perceived stress is a substantial problem among university students. Female students and students in health care colleges are at a greater risk of high perceived stress than other students. High perceived stress was correlated with smoking, lower GPA scores, and perceived insufficient family income. Our results can improve the stress prevention program by giving special attention to smokers, those with lower academic achievement, and inadequate family income. In addition, efforts should be directed toward improving the academic environment in health care colleges.

Acknowledgments

The authors would like to thank all students at the College of Medicine, KKU, for helping with the data collection.

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