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ORIGINAL RESEARCH

Perception of academic stress among Health Science Preparatory Program students in two Saudi universities

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Abstract: The Health Science Preparatory Program (HSPP) is a special program that aims to enhance the educational preparedness of students for participation in a health sciences career. Students spend their first university year in a combined extensive teaching program before they can be assigned to a particular health science specialty. It is thought that students enrolled in a highly competitive environment such as HSPP with a long list of potential stressors, including developmental, academic overload, language barriers and competition, are more disposed to stress and stress-related complications. This study aims to measure the level of academic stress and to determine its risk factors in students enrolled in HSPP-adapted local universities in Saudi Arabia. The study was conducted at two Saudi universities, King Saud University (KSU) and Imam Mohammad ibn Saud Islamic University (IMSU) with competition-based and non-competition-based HSPP learning models, respectively. Both universities adopt the HSPP system. The scale for assessing academic stress (SAAS) was used to assess students' perceived stress. A total of 290 students successfully completed the questionnaire (N=290), with a mean age of 18.66 years. Mean SAAS scores for KSU and IMSU students were 8.37 (SD = 4.641) and 7.97 (SD = 5.104), P=0.480, respectively. Only "satisfaction" and "associated social and health problems" have shown statistically significant correlation with university (P=0.000 and P=0.049, respectively). This study has found mean SAAS score for two local universities with competition-based versus non-competition-based HSPP learning models. Academic stress correlation with age, gender and universities was discussed, and valuable future work guidance was recommended.

Keywords: academic stress, HSPP, competition, stress mediators, SAAS score

Introduction

Stress is defined as the body's non-specific response to demands made upon it or to disturbing events in the environment. It is not just a stimulus or a response but rather, it is a process by which individuals perceive and cope with environmental threats and challenges. In small amounts, stress is normal and can help individuals to be more active and productive. However, very high levels of stress experienced over a prolonged period can cause significant mental and physical problems. Recently, Abdulghani et al[1] have found that stress prevalence among medical students has reached up to 63%, with 25% considered to be of severe type.

Academic stress is defined as the body's response to academic-related demands that exceed adaptive capabilities of students.[2] It is estimated that 10–30% of students experience some degree of academic stress during their academic career.[3] Indeed, academic stress among students enrolled in highly academic standards universities has a major impact. According to the American College Health Association 2006 survey of

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college students, the one greatest health obstacle to college students' academic performance was academic stress. Of the 97,357 college students who participated in the survey, 32% reported that academic stress had resulted in an incomplete, dropped course or a lower grade. Most commonly reported stressors in the academic environment are related to oral presentations, academic overload, lack of time to meet commitments and taking examinations.

From a neurohormonal physiology perspective, Al-Ayadhi[4] has shown that academic stress induces significant neurohormonal changes at the hypothalamic–pituitary–adrenocortical axis. A marked increment of stress hormones such as ACTH and cortisol has been found in first- and second-year Saudi medical students during an academic stressful situation. Other studies[5,6] have proven substantial immunological dysregulation in a similar group of students.

Indeed, stress can be augmented even more when students leave their parents and attend university for the first time, as it has been found that psychological symptoms, including stress, were commonly manifested among first-year college students.[1] Another stress-inducing factor is the highly competitive educational environment existing in the preparatory years. In a study demonstrating the dark side of competition,[7] the authors suggest that elevated competitive behavior or people feeling that they have become too inferior may increase vulnerability to depression, anxiety and stress. In another study, Feld[8] investigated the stress effect on high-pressure college preparatory school students and reported that there are high prevalences of harmful physical and psychological correlates of stress and related unhealthy behaviors, such as widespread and chronic sleep deprivation.

Health Science Preparatory Program (HSPP) is a special program that aims to enhance the educational preparedness of students for participation in a health sciences career. Students spend their first university year in a combined extensive teaching program before they can be assigned to a particular health science specialty. HSPP mainly focuses on improving English language proficiency among the students. This is alongside introductory courses in Chemistry, Biology, Physics, Biostatistics, Computer science and communication skills. It is thought that students enrolled in a highly competitive environment such as HSPP with a long list of potential stressors including developmental, academic overload, language barrier and competition are more disposed to stress and stress-related complications. This study aims to measure the level of academic stress and to determine its risk factors in students enrolled in HSPP-adapted local universities in Saudi Arabia.

Methodology

Samples and procedure

Two Saudi universities were selected to be involved in this study: King Saud University (KSU) and Imam Mohammad ibn Saud Islamic University (IMSU). Both universities adopt the HSPP system. KSU is the oldest and largest university in the Kingdom of Saudi Arabia (KSA), with leadership in health care teaching and providing. KSU campus includes five health-related colleges (College of Medicine, College of Dentistry, College of Pharmacy, College of Applied Health Sciences, and College of Nursing). HSPP students compete with each other for the limited seats each college provides (competition-based HSSP curriculum). On the other hand, IMSU has only recently established HSPP in its curriculum. The college of medicine is the only available college for HSPP students to pursue their career. This makes HSPP students at IMSU almost medical students. To enter medical school in their next year, HSPP students at IMSU are required to successfully finish all courses with an overall grade point average of 3.75 or above (non-competition-based HSPP curriculum). Moreover, they are obligated to enter International English Language Testing System examination at the end of the year and score minimally 5.5 out of 9, or more.

Official invitation letters for participation were sent to both universities' preparatory year deanship, and both the universities accepted to participate in this study. Student participation in the study was completely voluntary, and there were no consequences for either participation or withdrawal. A printed copy of the questionnaire was handed to the students during their break time. The attending investigator gave a short introduction explaining the idea behind the study to students.

Tool

The scale for assessing academic stress (SAAS) was used to assess students' perceived stress. SAAS is a 30-item self-report tool with "Yes" or "No" answers. Each item was given 1 point for "Yes", with a total score of 30, where 30 indicates maximum stress perceived and 0 lowest or no stress. All dimensions of possible human manifestation of stress were covered by the SAAS tool, including cognitive, affective, social/interpersonal, physical and emotional aspects. Besides simplicity of use of the SAAS, it was found to have high test–retest and split-half reliability, adequate internal consistency and ability to draw normally distributed data on academic stress. Mean (SAAS) score of students from Grade VII to XII was 5.06 with a standard deviation (SD) of 2.78.

Five more ("high", "moderate" and "low") multiple choice items were added to the finalized copy of the study tool to assess students' perception toward some potential stress mediators including motivation for achievement, social support, self-esteem, satisfaction and associated social and health problems. Students were asked to choose from "high", "moderate" or "low" to express their feelings regarding the following statements: 1) I would like to be within the top ranking of my class; 2) I receive adequate social support; 3) I am self-confident; 4) I am satisfied about my institution's quality of teaching, and 5) I have social and health problems that affect my life.

Ethical consideration

This study was ethically approved by the IMSU institutional review board committee, registered with KACST, KSA, reference No: HAPO-01-R-010.

Students' participation was completely voluntary and since there was no risk for participation in this study except for confidentiality of participant data, only verbal consent was required by the institutional review board. For insuring privacy and confidentiality of participants, no identity disclosure was needed from participants, and data were kept secure and anonymous.

Statistical analysis

The data have been analyzed using SPSS software v20 (IBM Corporation, Armonk, NY, USA). Basic descriptive statistics including frequency, mean values and SD were used to describe the study population. Pearson chi square and analysis of variance (ANOVA) tests were used to test the correlation between the study groups. *P* value of <0.05 was considered statistically significant.

Results

A total of 290 students successfully completed the questionnaire (N=290), with a mean age of 18.66 (16–23 years), SD = 0.695. A total of 171 (59%) students were from KSU, and 119 (41%) students were from IMSU. Male students were 186 (64.1%), while female students represented 104 (35.9%). Other sociodemographic data are shown in Table 1.

Mean SAAS scores for KSU and IMSU students were 8.37 (SD = 4.641) and 7.97 (SD = 5.104), *P*=0.480, respectively. Male and female student scores were 7.64 (SD = 4.856) and 9.22 (SD = 4.640), *P*=0.007, respectively. Partial representation of each SAAS indicator including cognitive, affective, physical, social/interpersonal and motivational indicators were mean scores of 1.94, 1.71, 1.51,.90 and 2.16, respectively (Table 2). Association between SAAS score and sociodemographic variables is shown in Table 3.

The majority of students who participated in the study showed high motivation to be within the top ranking of their classes (69%). The same percentage of students highly agreed with receiving adequate social support. Also, the majority of students disclosed high and moderate satisfaction regarding their institution's quality of teaching (30.3% and 51%, respectively). A total of 59.7% of students highly agreed with having

Table 1 Socio-demographic distribution of the students

University		Total, N	Age (years)	Marital status, N (%)			Economic status, N (%)			Accommodation, N (%)		
			Mean	Single	Married	Divorced	Good	Intermediate	Low	With family	University compound	Alone
IMSU	Male	73	18.91	71 (97)	2 (3)	0 (0)	47 (64)	25 (34)	1 (1)	66 (90)	3 (4)	4 (6)
	Female	46	18.35	46 (100)	0 (0)	0 (0)	35 (76)	10 (21)	1 (2)	45 (98)	1 (2)	0 (0)
KSU	Male	113	18.75	112 (99)	1 (1)	0 (0)	62 (54)	45 (39)	6 (5)	104 (92)	6 (5)	3 (3)
	Female	58	18.41	57 (98)	0 (0)	1 (2)	40 (68)	17 (29)	1 (2)	55 (95)	3 (5)	0 (0)

Abbreviations: IMSU, Imam Mohammad ibn Saud Islamic University; KSU, King Saud University.

Table 2 Distribution of students according to SAAS score with breakdown of scale indicators

University		Cognitive indicators	Affective indicator	Physical indicator	Social indicator	Motivational indicator	SAAS score out of 30
		Mean	Mean	Mean	Mean	Mean	Mean
IMSU	Male	1.75	1.47	1.30	0.82	1.86	7.15
	Female	2.15	1.83	1.80	1.13	2.41	9.26
KSU	Male	1.92	1.65	1.27	0.81	2.29	7.96
	Female	2.03	2.07	2.02	0.98	2.09	9.19
Total		1.94	1.71	1.51	0.90	2.16	8.21

Abbreviations: IMSU, Imam Mohammad ibn Saud Islamic University; KSU, King Saud University; SAAS, scale for assessing academic stress.

self-confidence and 78.6% of them admit low perception due to social and health problems that affect their lives. There was no correlation between gender and stress mediators (P=0.111, P=0.339, P=0.228, P=0.291, and P=0.795 for motivation of achievement, social support, satisfaction, self-esteem and associated social and health problems, respectively). Only "satisfaction" and "associated social and health problems" have shown statistically significant correlation with university (P=0.000 and P=0.049, respectively). Correlation between SAAS score and stress mediators are emphasized in Figure 1.

Discussion

In developing countries like the KSA, establishing an excellent higher education is a cornerstone for any future plans for development. In recent years, huge expansion of higher education facilities was made in the KSA. This can be reflected by the dramatic increment in the number of medical colleges, where within a decade, the number of medical colleges increased from five medical schools with traditional disciplined-based curricula to 21 medical colleges with varied curricula ranging from the traditional to more innovative, problem-based, and community-oriented programs. Moreover, the health system had major growth in recent years as shown by many national reports which in turn created a serious shortage in health care providers. This shortage in conjunction with Saudization movement of health care facilities has rushed local universities to graduate a larger number of health care providers to meet demand. Little is known about the quality and appropriateness of the educational environment in Saudi universities. One aspect which necessitates highlighting in any university environment is the psychological aspect. This study has examined students' perception of academic stress in two Saudi universities in Riyadh.

The present study has found that HSPP students have an academic stress perception of 8.37 (SD = 4.641), which is considered to be high when compared to similar study,[9] which found a mean SAAS score for high school students of 5.05. Similarly, HSSP students at KSU and IMSU perceived a larger amount of stress compared to another study which targeted Physical Therapy students (a mean SAAS score of 7.6). However, there are numerous differences to be considered when comparing the previous studies populations with our population. HSPP students are a unique population; they are more exposed to a variety of risk factors for psychologi-

Table 3 Association between SAAS score and sociodemographic variables with the ANOVA test

Variable		SAAS score	*P*-value
Gender	Male	7.64	0.007
	Female	9.22	
University	IMSU	7.97	0.48
	KSU	8.37	
Marital status	Single	8.24	0.527
	Married	5.33	
	Divorced	6.00	
Economic status	Good	8.27	0.124
	Intermediate	7.81	
	Low	11.22	
Housing	With family	8.16	0.607
	University compound	8.31	
	Alone	10.00	

Abbreviations: ANOVA, analysis of variance; IMSU, Imam Mohammad ibn Saud Islamic University; KSU, King Saud University; SAAS, scale for assessing academic stress.

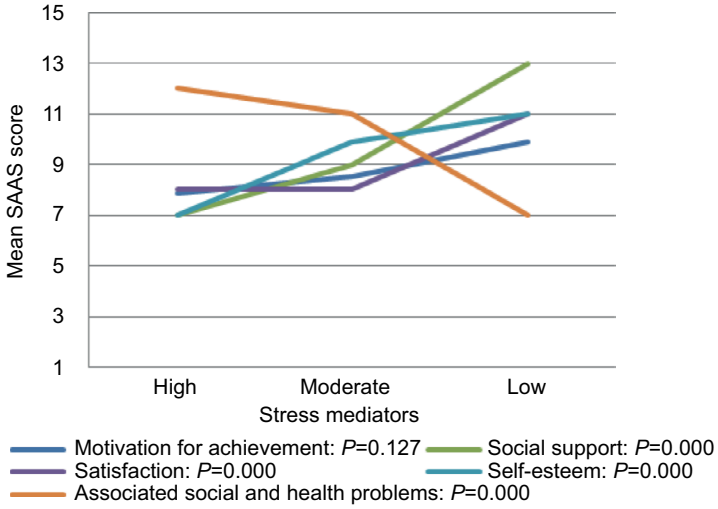

Figure 1 Variation of SAAS score according to "high", "moderate" or "low" perception of stress mediators with ANOVA test.
Abbreviations: ANOVA, analysis of variance; SAAS, scale for assessing academic stress.

cal distress, including academic stress, than any other group. On one hand, they are first-year college students, and they experience a lot of lifestyle changes to adapt with the new college environment they have been put in. This was clearly investigated by Geng and Midford,[10] and they found that first-year college students experienced higher stress than the normal population and in other college years. On the other hand, the HSPP program is very competitive. The acceptance rate of HSPP is usually the lowest among other college programs, and most of the students in HSPP have exceedingly high scores in their high school. In another term, HSSP students study in a highly competitive environment with high standards and expectations which could explain their higher stress perception compared to their counterparts.

In a similar study conducted at KSU preparatory year deanship, Al-Daghri[11] found that perceived stress was high at baseline among preparatory year students, which supports our findings. However, perceived stress and cortisol levels remained constant in both genders. Such a finding was attributed to successful stress adaption among the students. This finding, although it cannot be compared to our study due to different approaches, does contradict other studies in Western countries, which insist on stress as a predisposing factor for cardiometabolic complications in first-year college students.[12] It is worth noting that Al-Daghri's study[9] did not take into consideration the different preparatory programs adopted by the preparatory year deanship at KSU. In conjunction with HSPP, preparatory year deanship at KSU has other preparatory programs such as Science and Engineering Preparatory Program, Social Sciences Preparatory Program and others. A better research approach would consider such a variable as there could be significant difference in stress perception and coping among different preparatory programs.

To measure contribution of competition to academic stress perception, assessment of academic stress perception was conducted in two universities with competition-based (KSU) versus non-competition-based HSPP learning model (IMSU). HSPP students at KSU declared higher academic stress perception than their colleagues at IMSU (SAAS score 8.37 and 7.97, respectively); however, this relationship failed to demonstrate statistical significance (P=0.480). It is less clear whether competition in the educational environment improves students' performance or not, as there is huge controversy in this area. However, competition has been clearly proven to increase stress among students.[13] The present study is seemingly contradicting previous study because competition did not have statistically significant correlation with stress. However, such contradiction could be explained by exaggerated stressors in the non-competition-based HSPP learning model or buffered stressors in the competition-based HSPP learning model rather than actual miscorrelation between competition and academic stress.

Although age and seniority in health sciences colleges did make a difference regarding academic stress in comparative studies, in this study we could not find correlation between SAAS score and age (Pearson correlation: R=0.049, R^2=0.002, P=0.403). This supports the idea that there are external factors other than age, which could influence students' perception of stress.

Females' perception of academic stress on the SAAS scale was statistically significantly higher than that of males (ANOVA test F 7.300 P=0.007). Perception of academic stress among females was more toward affective and physical indicators (P=0.016 and P=0.000, respectively). Although this finding contradicts other studies done in India,[9] Israel[16] and Nepal,[18] it does confirm other studies done in Saudi Arabia[11] and Egypt.[19] Other than the psychological and physiological discrepancies between males and females, this finding can be explained by the struggle of female students in a male-dominant environment with many fewer opportunities offered for females compared to males. Females from IMSU were the most stressed group of students in our study, with an SAAS score of 9.26, SD = 4.72. It needs to be considered that the female HSPP department at IMSU is newly established and those students involved in the study were the first ever to attend this program. Although, IMSU students are believed to be under a less amount of stress compared to KSU students due to a competition-based versus non-competition-based HSPP learning model, a newly established program like the female HSPP program at IMSU could exert academic stress in different ways. Being the first batch in a new program with no seniors and less well-established program rules and regulations could explain this finding. More and extensive evaluation of the HSPP program at IMSU is certainly recommended to discover potential stressors in such an environment.

All stress mediators have shown statistical significance with academic stress except for motivation of achievement (Figure 1). Higher satisfaction, self-esteem and social support and lower social and health problems seem to alleviate stress. Students of IMSU especially females appear to be less satisfied about their institution than KSU students (P=0.000).[14] Chraif has found that satisfaction is strongly correlated with reactivity to stress. Moreover, satisfaction about the institution could be linked to quality of the educational environment.[15] When taken collectively, this could explain the higher academic stress perception among females at IMSU. Although

satisfaction was not a main element to be assessed in this study, the satisfaction survey component revealed a major discrepancy between the two universities which could guide future work to study satisfaction in such an environment.

Limitations of the study

The study was conducted during the second half of the first semester, and there were no available data of students' marks or withdrawal rate. This is why the study did not investigate the link between academic stress and student performance at KSU and IMSU. It would be of great value to follow HSPP students for a full academic year in an attempt to draw conclusions about the effect of higher academic stress on students' performance.

Conclusion

As far as is known, this was the first attempt to study academic stress among HSPP students in Gulf countries. HSPP is a newly established educational program in most of the local universities, where students are put in a highly competitive environment with life-changing decisions and circumstances. The impact of such an environment on students' mentality was unknown. This study has found mean SAAS scores for two local universities with competition-based versus non-competition-based HSPP learning models. Academic stress correlation with age, gender and universities was discussed and valuable future work guidance was recommended.

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Disclosure

The authors report no conflicts of interest in this work.

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