Original Research Article

Determinants of academic stress and stress-related self-medication practice among undergraduate male pharmacy and medical students of a tertiary educational institution in Saudi Arabia

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Abstract

Purpose: To identify factors that promote academic stress and stress-related self-medication practice among undergraduate male students of pharmacy and medical colleges at Imam Abdulrahman Bin Faisal University, Dammam, Saudi Arabia.

Methods: A cross-sectional survey was conducted among undergraduate students of pharmacy and medical colleges of the university. The study used Perceived Stress Scale (PSS) to document academic stress. The responses of the students were analyzed using SPSS version 22.

Results: As many as 51.6 % of students' perceived moderate stress. The majority of students (55.9 %) highlighted examination as a stressor followed by course load (43.2 %) and cGPA (40.4 %). Prevalence of self-medication was 31.58 and 29.20 % among pharmacy and medical students, respectively. Most of the students consumed caffeine (63.8 %) and nicotine (17.8 %) as a drug. Students blamed heavy course load (23.9 %), followed by assignment load (23 %) and examination (21.1 %) for indulging in self-medication.

Conclusion: Academic stress in undergraduate students in health disciplines is perceived to be high by the students. Examinations, course load and lack of time for leisure are major determinants of stress. Caffeine and nicotine are most frequently used by a majority of the students for self-medication.

Keywords: Stress, Self-medication, Stressor, Caffeine, Nicotine, Students

INTRODUCTION

Stress may be defined as any non-specific body response towards any change whose outcome may affect one's life. Besides the general populace, students are also victims of stress and its outcomes as reported in various studies [1]. The predisposing factors for stress in students may be lack of sufficient time for managing courses, exams, academic load, social and

interpersonal issues etc. as supported by a study regarding stress, depression and anxiety conducted in undergraduate students of Kathmandu University Medical School, Nepal. The result of the study revealed a high prevalence for stress 27 %, anxiety 41.1 % and depression 29.9 % [1].

Similarly, a study in King Saud Bin Abdulaziz University for Undergraduate Sciences, Riyadh, Saudi Arabia reported 33.8 % of students with severe stress. Nervousness, restlessness, feeling hopeless as well as depression were observed as the predisposing and dominant factors for stress [2].

During preclinical studies and research it has been observed that individuals with stress used to self-medicate hence leading to drug abuse for controlled or addicted substance [3]. The concept of self-medication is widely observed in undergraduate students also as medical students revealed a high ratio i.e. 75.2 % of student with self-medication particularly for analgesics [4] In addition, a study about factors resulting in the use of alcohol and eliciting drugs revealed cannabis as widely used illicit drug among students with stress [5] as well use of non-prescription stimulant medication such as dextroamphetamine and amphetamine, etc [6].

Stress may also affect the sleep patterns of an individual whereby tendency for self-medication of stimulant drugs increases as observed with the use of psychoactive drugs among undergraduate students in a university [7] as well as the use of sedative drugs in undergraduate students at King Saud University, Saudi Arabia. The reasons observed for this stress were low grade point, less sleeping hours per day, poor as well as disturbed sleeping patterns [7].

The aim of this study is to investigate the level of stress and self-medication among undergraduate male students of Imam Abdulrahman Bin Faisal University.

METHODS

A cross-sectional survey was conducted among undergraduate male students of pharmacy and medicine colleges at Imam Abdulrahman Bin Faisal University (IAU) (formerly University of Dammam) located in the city of Dammam, Saudi Arabia.

Duration and venue of the study

The study was of four month duration, i.e., February 2017 to May 2017. The venues of the study were College of Clinical Pharmacy and College of Medicine, IAU.

Target population and exclusion criteria

Male students currently enrolled in these colleges were identified as the target population. Students studying in other universities and drop-out students were excluded. Additionally, those who did not consent to participate were also not included.

Research instrument, piloting and validation

The study used the Perceived Stress Scale (PSS) to document academic stress in target population. The PSS contained 10 – items related to quantifying stress level. It is already validated in Arab population [8]. Hence, there was no need to validate the tool. A separate questionnaire was used to document demographics of students and information about the stressors.

This questionnaire was also developed and validated in the same population. The investigators obtained and used the questionnaire with permission from Al Rasheed F [9]. The reliability analysis reported a *Cronbach alpha* value 0.715 for N = 10 items. It was piloted in 29 female students and was validated.

Sampling procedure

The study used convenient sampling technique. The male students enrolled in pharmacy and medical institutes in Saudi Arabia are 3432 and 9610 [10]. Sum of these two values, i.e., 13042, was the total population used. Sample size was calculated at 95 % confidence level and was 373 [11].

Data analysis

The responses were entered and analyzed by using SPSS version 22 software. Data were presented in the form of sample counts (N), percentages (%) and *p*-value. Prevalence data were reported in percentages (%) and 95 % confidence interval ranges.

Ethical approval and consent

The students were briefed about the purpose of the study and verbal consent was sought from the respondents before handing them the questionnaire. The study was approved as an undergraduate research project by Department of Pharmacy Practice, College of Clinical Pharmacy. The reference number of approval was 2130000502.

RESULTS

Demographics of the respondents

A total of 213 male students responded to the study. The majority was in age group between18 to 20 years (N = 135, 63.4 %). The study included students from all academic years i.e. preparatory year to 5th year and from clinical pharmacy (N = 76, 35.7 %) and medicine (N = 137, 64.3 %) colleges. Almost all students were single (N = 210, 98.6 %) and most of the students stayed with family (N = 136, 63.8 %). The majority of students (N = 161, 75.6 %) did not suffer from any disease however, some students reported anxiety (N = 21, 9.9 %) followed by few students who highlighted obesity (N = 10, 4.7 %) and depression (N = 8, 3.8 %). A fourth proportion (N = 85, 39.9 %) never practiced self-medication. More than half of those students who mentioned practicing self-medication highlighted the use of caffeine (N = 136, 63.8 %) followed by some students who consumed nicotine (N = 38, 17.8 %) as a drug. The demographic characteristics are summarized in Table 1 and 2.

Table 1: Respondents' demographic characteristics

Variable	N	%
Age (years)		
18 to 20	135	63.4
21 to 23	76	35.7
24 to 26	2	0.9
Total	*213*	*100.0*
College		
Clinical pharmacy	76	35.7
Medicine	137	64.3
Total	*213*	*100.0*
Study year		
Preparatory year	44	20.7
2nd year	78	36.6
3rd year	51	23.9
4th year	35	16.4
5th year	5	2.3
Total	*213*	*100.0*
Living status		
Campus (away from family)	77	36.2
Stay with family	136	63.8
Total	*213*	*100.0*
Marital status		
Married	3	1.4
Single	210	98.6
Total	*213*	*100.0*

Determinants of academic stress

The majority of the students (N = 119, 55.9 %) higlighted exams followed by those (N = 92, 43.2 %) who mentioned course load. Furthermore, nearly half of the students strongly agreed (N = 86, 40.4 %) that cGPA is a stressor for them. Most of the students were unsure whether assignment load (N = 82, 38.5 %) and competition among classmates (N = 137, 64.3 %) are stressors. A third proportion of students (N = 62, 29.1 %) strongly agreed that thinking about career and future perspectives results in academic stress followed by some students (N = 60, 28.2 %) who mentioned lack of recreational time during semester caused academic stress. Additionally, most of the students (N = 75, 35.2 %) strongly disagreed with the notion of family issues acting as a stressor. The summary of students' response to determinants of academic stress is presented in Table 3 and 4.

Table 2: Respondents' demographic characteristics

Variable	N	%
Disease information		
Diabetes mellitus	4	1.9
Hypertension	3	1.4
Anxiety	21	9.9
Depression	8	3.8
Obesity	10	4.7
Migraine	5	2.3
Asthma	1	0.5
I do not suffer from any disease	161	75.6
Total	***213***	***100.0***
Self-medication due to stress over the last month		
Always (three day per week)	13	6.1
Often (one day per week)	21	9.9
Sometimes (once in two weeks)	43	20.2
Rarely (once in a month)	51	23.9
Never	85	39.9
Total	*213*	*100.0*

Prevalence of academic stress among students

A perceived stress scale (PSS) was used to report academic stress among undergraduate students. More than half of respondents (N = 110, 51.6 %) perceived moderate stress. The summary of PSS results is presented in Table 5.

Prevalence of self-medication in stress

The prevalence of stress related self-medication was documented in two colleges. Comparatively, a high prevalence rate of 31.58 % *(21.39 - 43.25 % for 95 % CI)* was observed for pharmacy students followed by prevalence in students of medical college i.e. 29.2 % *(21.75 % – 37.57 % for 95 % CI)*.

Drug used and reasons for self-medication

Almost half of the students (N = 85, 39.9 %) never used any drug during stress however,

most students who indulged in self-medication practice mentioned using caffeine (N = 136, 63.8 %) followed by some students (N = 38, 17.8 %) who mentioned nicotine. Reasons given as justification for practicing self-mediation by students were: course load (N = 51, 23.9 %), examinations, quizzes and assignments (N = 49, 23 %) and examination stress (N = 45, 21.1 %). The summary of results regarding drugs and reasons of self-medication is presented in Table 6.

Table 3: Determinants of academic stress among undergraduate students

Determinant	N	%
Stress due to course load		
Strongly agree	92	43.2
Agree	84	39.4
Neutral	29	13.6
Disagree	5	2.3
Strongly Disagree	3	1.4
Total	213	100.0
Stress due to assignment load		
Strongly agree	35	16.4
Agree	67	31.5
Neutral	82	38.5
Disagree	24	11.3
Strongly Disagree	5	2.3
Total	213	100.0
Stress due to exams		
Strongly agree	119	55.9
Agree	67	31.5
Neutral	21	9.9
Disagree	4	1.9
Strongly Disagree	2	0.9
Total	213	100.0
Stress due to competition among classmates		
Strongly agree	33	15.5
Agree	35	16.4
Neutral	77	36.2
Disagree	43	20.2
Strongly Disagree	25	11.7
Total	213	100.0

Cross tabulation of demographic variables and perceived stress score

The cross tabulation between college and perceived stress score (PSS) was significant (*p value < 0.05*). Similarly, living status of students was also significantly assciated with stress score (*p value < 0.05*). The variables such as age group, college and study year were not statistically significant. The summary of cross tabulations is presented in Table 7 and 8.

DISCUSSION

Academic stress has become a psychological challenge for students that need to be tackled as it has the potential to cause emotional and mental breakdown which may hinder academic performance and growth. This study was conducted in male students of pharmacy and medicine colleges who were studying in different academic years. The students were mostly single in age group 18 to 20 years and lived with their family [12]. Two thirds of respondents highlighted good self-perceived health and well-being. This was in concordance with earlier findings and was a characteristic feature of Saudi academia [9,13-15].

Academic stress was reported using Perceived Stress Scale (PSS). We found that almost half of the students perceived moderate stress followed by a third segment who perceived high academic stress. This figure was similar to the stress reported among female students by Al Rasheed *et al* [9], however, it was dissimilar to the findings in British students where percentage of students

Table 4: Determinants of academic stress among undergraduate students

Determinants	N	%
Stress due to thinking about career and future perspectives		
Strongly agree	62	29.1
Agree	79	37.1
Neutral	52	24.4
Disagree	13	6.1
Strongly Disagree	6	2.8
Total	213	100.0
Stress due to lack of recreational time (free time) during semester		
Strongly agree	60	28.2
Agree	62	29.1
Neutral	61	28.6
Disagree	25	11.7
Strongly Disagree	5	2.3
Total	213	100.0
Stress due to cGPA		
Strongly agree	86	40.4
Agree	74	34.7
Neutral	37	17.4
Disagree	9	4.2
Strongly Disagree	7	3.3
Total	213	100.0
Stress due to family issue		
Strongly agree	16	7.5
Agree	30	14.1
Neutral	46	21.6
Disagree	46	21.6
Strongly Disagree	75	35.2
Total	213	100.0

Table 5: Perceived stress score interpretation

Perceived Stress Score Interpretation	Sample (N)	%
Low perceived stress (Less than 13)	40	18.8
Moderate perceived stress (13 to 20)	110	51.6
High perceived stress (Above 20)	63	29.6
Total	*213*	*100.0*

Table 6: Drugs used and reasons for self-medication

Variable	N	%
Drugs used for self-medication		
Nicotine (Smoking)	38	17.8
Caffeine (Coffee/Tea)	136	63.8
Amphetamine (Methylphenidate)	5	2.3
Mood enhancers (Escitalopram, Fluoxetine)	20	9.4
Memory Enhancers (Ginseng, Ginkgo)	1	0.5
Personal Issues (Viagra, Yohimbine etc.)	1	0.5
Antihistaminic drugs (Cetirizine, loratadine etc.)	12	5.6
Total	213	100.0
Reasons for self medication		
Lack of sleep	12	5.6
Family problems	2	0.9
Course load	51	23.9
Examination stress	45	21.1
Hospital rounds	1	0.5
Lack of Proper Environment at University	2	0.9
Lack of Proper environment at Hostels	1	0.5
No free time for recreational activities	3	1.4
No free time for gatherings	1	0.5
Financial Problems	1	0.5
Personal Issues	6	2.8
Health Issues	14	6.6
Exams, quizzes and assignments	49	23.0
Course load and no free time for gathering and recreational activities	25	11.7
Total	***213***	***100.0***

Table 7: Cross tabulation between study variables and perceived stress score (N = 213)

Cross-tabulation		Observed (expected)			*P-value*
		Perceived stress score			
		Low (< 13)	***Moderate (13 to 20)***	***High (Above 20)***	
Age group (years)	18 to 20	22 (25.4)	71 (69.7)	42 (39.9)	>0.05
	21 to 23	18 (14.3)	39 (39.2)	19 (22.5)	
	24 to 26	0 (0.4)	0 (1)	2 (0.6)	
		Perceived stress score			
		Low perceived stress (<13)	***Moderate perceived stress (13 to 20)***	***High perceived stress (> 20)***	
College	Clinical pharmacy	17 (14.3)	45 (39.2)	14 (22.5)	0.02
	Medicine	23 (25.7)	65 (70.8)	49 (40.5)	

Table 8: Cross tabulation between study variables and perceived stress score

Cross-tabulation		Observed (expected)			*P-value*
		Low perceived Stress (Less than 13)	***Moderate perceived Stress (13 to 20)***	***High perceived Stress (Above 20)***	
Study year	Preparatory year	9 (8.3)	24 (22.7)	11 (13)	0.53
	2nd year	11 (14.6)	39 (40.3)	28 (23.1)	
	3rd year	11 (9.6)	24 (26.3)	16 (15.1)	
	4th year	9 (6.6)	20 (18.1)	6 (10.4)	
	5th year	0 (0.9)	3 (2.6)	2 (1.5)	
		Perceived stress score			
		Low perceived Stress (< 13)	***Moderate perceived stress (13 to 20)***	***High perceived stress (> 20)***	
Living status	With family	19 (25.5)	79 (70.2)	38 (40.2)	0.01
	Campus accommodation	21 (14.5)	31 (39.8)	25 (22.8)	

who perceived high stress was much lower [16]. This finding denotes that Saudi students perceive moderate to high academic stress [17,2]. Our study reported no association of some demographic variables such as age groups, study year, college affiliations and living status with PSS score. This entails that academic stress is prevalent in this population regardless of age, study year, college and residential status. This finding is contradictory to previous literature and is a novel finding in this academic environment.

Most of the students mentioned examination, course load and cumulative grade point average cGPA as stressors (in descending order). This is in accordance with the results of the study of Al Rasheed *et al* among female students studying at the same venue which also reported examination and course load as stressors [9]. Further to this, students studying in other universities of Saudi Arabia highlighted same factors that promote academic stress among them [2,3,9]. Hence, examination and course load may be considered as general determinants of stress among Saudi students.

Exam preparation may result in prolonged study duration and may encompass days and night times hence requiring CNS stimulants such as caffeine. We observed that students who indulged in self-medication mostly consumed caffeine followed by some who self-medicated with nicotine. The prevalence of self-medication in stress among students of Medicine and Pharmacy colleges was reported at 29.20 % and 31.58 %. Those who mentioned consuming caffeine used it in the form of tea, coffee and energy drinks. In this context, it was important to describe the extent to which caffeine was not considered as a drug. Students were asked to clarify if their dietary pattern changed with respect to consuming tea, coffee and energy drink in stress and if it was consumed in larger amount than standard intake. A study conducted among high school students in Riyadh city reported a nominal consumption of caffeine in the form of energy drinks (5 %) during exams. This finding implied that consumption of caffeine has increased a lot among higher secondary students during examination period which is one of the stressor [18].

Additionally, nicotine was the second most common drug highlighted by students. Study conducted among female students at the same venue reported absolutely no consumption of nicotine which draw attention to that fact that it was mainly used by male students as a recreational drug that may not relate to any stressor [9]. An interesting observation in our study was use of amphetamines i.e. methylphenidate. Though in less but significant numbers, students mentioned using methylphenidate during stress. This encores the findings of Baker who observed that Saudi Arabia witnessed an increase in the use of such drugs [19]. Further to this, the use of CNS stimulants among households in Saudi Arabia was reported at 16 % a decade ago [20]. In this context, a study conducted among pharmacy students of Karachi, Pakistan reported a prevalence of psychoactive stimulants use of around 8 % [21]. The encouraging point that can be considered from this finding is the percentage of students who mentioned using methylphenidate was a minute 2.3 %.

Limitations of the study

This was a cross-sectional study and collected responses from the students at a single point in time. The timeline of the data collection included examination period and semester classes that may result in measurement bias. However, the authors excluded the examination time period and timed the data collection in off-peak days to overcome measurement bias.

CONCLUSION

The study documents the academic stress and stress-related self-medication practice among pharmacy and medical students. We found that the prevalence of self-medication in stress is higher among pharmacy students than medical students. Stress among the students is moderate to high, and is mainly due to examinations and heavy course load. Consumption of caffeine dramatically increases during examination periods among the students.

DECLARATIONS

Conflict of interest

The authors declare that no conflict of interest exists with regard to this study.

Contribution of authors

We declare that this work was done by the authors named in this article and all liabilities pertaining to claims relating to the content of this article will be borne by the authors. MAS and RA executed the idea, presented a research proposal and collected the data. AAN and NA helped data entry into SPSS file. RA and AAN performed statistical analysis. MAS and RA wrote and produced a final shape of the

manuscript. AAN and NA wrote the result and discussion as well review of article for expert opinion and any grammatical or language errors.

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