

ORIGINAL ARTICLE

Stress Indicators Among 21st Century University StudentsKavitha Ashok Kumar¹, Aina Suraya², Ashok Kumar Jeppu³, Sohayla M. Attala^{4,5}, Sakina R³¹ Otorhinolaryngology Unit, International Medical School (IMS), Management and Science University (MSU), Seksyen 13, 40100 Shah Alam, Selangor, Malaysia.² International Medical School (IMS), Management and Science University (MSU), Seksyen 13, 40100 Shah Alam, Selangor, Malaysia³ Biochemistry Unit, International Medical School (IMS), Management and Science University (MSU), Seksyen 13, 40100 Shah Alam, Selangor, Malaysia.⁴ Forensic Medicine Unit, International Medical School (IMS), Management and Science University (MSU), University Drive, Off Persiaran Olahraga, Shah Alam, 40100, Malaysia.⁵ Forensic Medicine and Clinical Toxicology department, Faculty of Medicine, Mansoura University, 25 Elgomhouria Street, Mansoura, 35516, Egypt.**ABSTRACT**

Introduction: Pursuing higher education has always been considered to be stressful as students need to adapt to new social and academic environment. Higher education in recent years has shifted from teacher centred authoritarian approach to student centred learning with amicable learning environment. In this changing scenario, this study aims to identify the indicators of stress and stress levels among 21st century university students and fathom the demographic factors influencing it. **Method:** A cross-sectional survey was conducted on students attending a private university in Malaysia using Stress Indicators Questionnaire. The data was analysed with descriptive and inferential statistical tests. **Results:** A total of 1050 university students aged between 18-30 years from different faculties voluntarily participated in the study. All respondents reported stress varying from very low to dangerous levels. Among the indicators of stress, sleep and emotional indicators were at dangerous levels, physical indicators and personal habits were at high level and behaviour indicators were perceived at medium level. A significant difference in total stress score between students of different age groups and ethnicity were observed, while no significant difference was noted with regards to gender. **Conclusion:** This study reveals that various indicators of stress are prevalent among the present-day university students. It may help guide policy makers and teachers in early identification of stress among their pupils and plan effective strategies aimed at balancing a good quality of life and academic achievement for the learners in institutions of higher learning.

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INTRODUCTION

Stress is the body's response to the demands made on it. It forms a part of the process of how we perceive and cope with the challenges we face day to day (1). Hence, stress is an essential and inevitable part of daily living. It can have positive as well as negative effects on an individual's life depending on how the individual handles and manages it. Some may take it as a challenge and work harder, while others may succumb to it and lag behind. It may influence the learning abilities as well as lead to psychological problems (2,3). The physical and environmental events which cause stress are called

stressors which maybe internal or external (4). Common internal stressors are the psychological disturbances within oneself like ego or physical illness while the external stressors are weather conditions, friends or family related responsibilities and an unsafe atmosphere (1). In addition to these, university students face pressure from academics with an obligation to succeed (5), unlimited parental expectations (6), financial constraints (7), family separation (6) and uncertain future employment opportunities (8). Physical changes in the adolescents and social relationships have been shown to contribute to stress in the age group of 12-25 years (9). These are bound to cause psychological conflicts among university students and has rightfully grabbed the attention of many researchers who have studied the levels of stress, anxiety and depression among students, its effects on their academic performance or on the factors attributing to stress (2,4,10,13,14,15,16). Consequently, literature

on the indicators of stress among the university students is sparse. The present study makes an attempt to fill in this gap.

Continuous exposure to stress among students can lead to disruption in their physical as well as mental health which may manifest with physical symptoms, emotional disturbances, sleeplessness, behavioral changes and depression (1). The World Health Organization (2010) has defined health as the state of complete physical, mental and social wellbeing and not a mere absence of disease or infirmity (11). In the western world, poor mental health has been considered to be the commonest cause for loss of disability-adjusted life years (12). Literature review shows high stress prevalence among young adults especially university students in Malaysia (2,10,13,14,15,16). To maintain a healthy mind in a healthy body, university education in recent years has shifted from teacher-centred authoritarian approach to student-centred learning with emphasis on learning outcomes, amicable learning environment and highly individualized learning modes. Students now play a central role in curriculum designing and decision making. In this changing scenario, the current research was conducted with an aim to study the stress levels and the indicators of stress among students attending various undergraduate courses in a private university in Malaysia which focuses on 21 st century pedagogy.

MATERIALS AND METHODS

Study setting

This study was conducted on university students attending a private university in Shah Alam, Malaysia. Students aged 18 years and above, who were not diagnosed with any physical or mental ailment, pursuing undergraduate studies and willing to participate in this study were recruited.

Study approach and design

The study employed a quantitative approach with cross-sectional study design to examine the stress level and the indicators of stress among young adults. The data was collected by survey using a well-structured validated questionnaire with convenience sampling technique between July 2020 and December 2020. University students were approached to fill in this questionnaire at the campus after taking an informed consent. They were assured confidentiality of the data collected and that participating in this study would be entirely voluntary. The data collected was transferred into Microsoft excel spreadsheet for further analysis.

Study tool

The survey instrument used for the study was adapted from Stress Indicators Questionnaire (17). The 75-item questionnaire consisted of 22 items on physical indicators, 5 items on sleep indicators, 18 items on behavioral indicators, 21 items on emotional indicators

and 9 items on personal habit indicators. The participants had to rate their response for each item on a 5 -point Likert scale with response options of 5= Almost Always (on five days a week), 4=Most of the time (on three days a week) 3=Some of the time (on one and one-half days a week), 2= Almost never (less than two hours a week) and 1= Never. This scale was easy to administer and could act as an interval scale for further statistical analysis(18,19). The total score for all items under each indicator was calculated and the stress level for that particular indicator was determined as very low, medium, high, very high or dangerous as shown Table I.

Table I: Stress indicator scoring

Indicators	Very Low	Medium	High	Very High	Dangerous
Physical	22	30	38	48	54+
Sleep	5	8	10	12	14+
Behaviour	18	27	36	45	50+
Emotional	21	29	37	46	55+
Personal Habits	9	15	20	25	30+

source (17)

The questionnaire was pilot tested on a similar group of 30 university students and modified for ambiguity in terms of language. The calculated Cronbach's alpha was 0.71 which shows an acceptable reliability (internal consistency) of the instrument (20).

Ethical consideration

This research study was conducted after obtaining ethical approval from the University Research Committee. A participant information sheet along with consent form was provided to all the respondents along with the questionnaires. The participant information sheet explained the objectives of the study as well as assured the participants that the data gathered would be kept confidential and used for research purpose only. They were informed about their right to refuse or withdraw from the study. An informed consent was taken from all the participants.

Data analysis

The data was analysed with descriptive and inferential statistics using Statistical Package for the Social Sciences (SPSS) version 26. Independent sample t test and One way ANOVA was used to evaluate the influence of sociodemographic profile of the study population on the total stress level. Pearson correlation was used to study the correlation between the stress indicators. The significance level for all the analysis was set at $p < 0.05$.

RESULTS

A total of 1050 university students voluntarily participated in this study. The demographic profile of the participants was as shown in Table II. Majority of the respondents (94.4%) were in the age group of 18-30 years with 51.9% males and 48.1% females. Many of the respondents were Malay (81.4%), followed by

Table II: Demographic profile of the respondents

Demographics		Frequency (N)	Percentage (%)
Age	18-24yrs	638	60.8
	>24yrs -30yrs	353	33.6
	>30yrs	59	05.6
Gender	Male	545	51.9
	Female	505	48.1
Ethnicity	Malay	855	81.4
	Chinese	130	12.4
	Indian	49	04.7
	Others	16	01.5
Faculty	Medicine	223	21.2
	Health sciences	79	7.5
	Pharmacy	73	7.0
	Engineering	129	12.3
	Business Management	253	24.1
	Hospitality and creative arts	229	21.8
	Education	64	6.1

Chinese (12.4%), Indians (4.7%) and others (1.5%). They were studying in different faculties including Medicine (21.2%), Health Sciences (7.5%), Engineering (12.3%), Hospitality (21.8%), Pharmacy (7.0%), Business Management (24.1%) and School of Education(6.1%)

Stress indicators

In the present study, the calculated stress levels for each of the stress indicators was as shown in Table III. Majority of the students perceived stress at dangerous level with sleep and emotional indicators while it manifested with physical symptoms and personal habits at high level. On behaviour indicators, majority of the respondents perceived it at medium level.

Physical indicators (PI)

An alarming 89 % of the respondents perceived stress in form of physical indicators at high to dangerous levels. Among the physical indicators, majority of the students chose "I get severe and chronic headaches" as the most common manifestation of stress followed by "I smoke tobacco" and "I lack physical energy".

Sleep indicators (SI)

A total of 91.4 % of the respondents had sleep indicators of stress at high to dangerous levels and among them,

53.3% perceived it at dangerous level. "I have trouble in falling asleep" was the commonest symptom chosen by 75% of the students. The other items which the students rated high were "I take pills to get sleep" and "I have nightmares or repeated bad dreams".

Behavioural indicators (BI)

Only 41.4% of the respondents had behaviour indicators of stress at high to dangerous levels as a vast majority of the respondents had behaviour indicators at medium level. Among the various behaviour indicators, 74.8% chose "I have to work late" while a minority of students said "I drink alcohol" when stressed. The other behaviour indicators like getting drunk, taking prescription drugs, watching television for long hours alone or betting was not chosen by any of the respondents.

Emotional indicators (EI)

On emotional indicators, 91.5% respondent's scores were on high to dangerous levels. Among the various emotional indicators, the students commonly chose "I worry a lot", "I am not optimistic about the future" and "I have trouble remembering things".

Personal habits (PH)

On this parameter, 88.1% of the respondents, perceived stress at high to dangerous levels. The university students across faculty agreed on "difficulty in planning for activities".

Relationship between different stress indicators

In the present study, the correlation between the five indicators of stress was as shown in Table IV. A significant correlation was observed between the total score on physical indicators with emotional and personal habits indicators. Similarly, a statistically significant correlation was seen between sleep indicators with behavior and emotional indicators. Behavior indicators also showed a statistically significant correlation with emotional indicators.

Relationship of demographic profile of the study population on the total stress score

In the present study, no significant difference in the total stress score was noted between the male and female students. However, there was a statistically significant difference in the total stress score based on age and

Table III: Stress indicators and stress levels among the study population

Stress levels	Stress Indicators									
	Physical		Sleep		Behaviour		Emotional		Personal habits	
	N	%	N	%	N	%	N	%	N	%
Very low	24	2.3	18	1.7	11	1.0	34	3.2	32	3.0
Medium	94	9.0	72	6.9	604	57.5	56	5.3	92	8.8
High	788	75.0	82	7.8	348	33.1	72	6.9	790	75.2
Very high	107	10.2	318	30.3	64	6.1	323	30.8	101	9.6
Dangerous	37	3.5	560	53.3	23	2.2	565	53.8	35	3.3
Total	1050	100	1050	100	1050	100	1050	100	1050	100

Table IV: Correlation between different stress indicators

	PI	SI	BI	EI	PH
PI	1	-0.002	0.055	0.093**	0.081**
Sig(2 -tailed)		(0.946)	(0.075)	(0.003)	(0.009)
SI	-0.002	1	0.141**	0.076*	0.047
Sig(2 -tailed)	(0.946)		(0.000)	(0.013)	(0.130)
BI	0.055	0.141**	1	0.080**	0.001
Sig(2 -tailed)	(0.075)	(0.000)		(0.009)	(0.981)
EI	0.093**	0.076*	0.080**	1	0.051
Sig(2 -tailed)	(0.003)	(0.013)	(0.009)		(0.100)
PH	0.081**	0.047	0.001	0.051	1
Sig(2 -tailed)	(0.009)	(0.130)	(0.981)	(0.100)	

Pearson correlation

** Significant at the 0.01 level. (2-tailed), * Significant at the 0.05 level. (2-tailed)

ethnicity of the participants as shown in Table V.

Relationship between gender of the study population with total stress score

The independent sample t test results indicate that the difference in the total stress score among male and female respondents was not statistically significant.

Relationship between age of study population with total stress score

In the present study, a significant difference was observed in the total stress score between the three age groups of the study population (Table V). On further analysis with Bonferroni test, a statistically significant difference was noted between the stress score of students in 18-24years group when compared to their peers in >24-30 years and > 30 years age groups, while no significant difference was noted between the >24-30 years and > 30 years age groups (Table VI).

Relationship between the ethnicity of the study population with total stress score

Students belonging to the three main ethnic groups in Malaysia participated in this study. Though the number of Malay students formed the majority of the sample, it was representative of the different ethnicities in general population (21). A significant difference was noted in the total stress scores between the three ethnic groups (Table V). On further analysis with Bonferroni test, a

Table VI: Stress levels among students of different age groups

Age (years) (I)	Age (years) (J)	Mean	Std. Error	Sig.	95% Confidence Interval	
					Lower bound	Upper Bound
18-24	24-30	-5.53434*	.65962	.000	-7.1160	-3.9527
	>30	-5.79193*	1.35311	.000	-9.0365	-2.5474
24-30	18-24	5.53434*	.65962	.000	3.9527	7.1160
	>30	-.25760	1.39859	1.000	-3.6112	3.0960
>30	18-24	5.79193*	1.35311	.000	2.5474	9.0365
	24-30	.25760	1.39859	1.000	-.3.0960	3.6112

*. The mean difference is significant at the 0.05 level (Bonferroni test)

Table VII: Stress levels among students of different Ethnicity

Ethnicity (I)	Ethnicity (J)	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower bound	Upper Bound
Malay	Chinese	-5.18938*	.95573	0.000	-7.4811	-2.8976
	Indian	-4.68075*	1.49134	0.005	-8.2568	-1.1047
Chinese	Malay	5.18938*	0.95573	0.000	2.8976	7.4811
	Indian	.50863	1.70189	1.000	-3.5723	4.5896
Indian	Malay	4.68075*	1.49134	0.005	1.1047	8.2568
	Chinese	-.50863	1.70189	1.000	-4.5896	3.5723

*. The mean difference is significant at the 0.05 level (Bonferroni test)

statistically significant difference was noted between the total stress score of Malay students when compared to their Chinese or Indian peers (Table VII). No significant difference was noted between the Chinese and Indian students.

DISCUSSION

In our study, all respondents reported stress ranging from very mild to dangerous levels. Mathews (2017) in a study in India reported that 84% of the students had moderate level of stress (1) while Ratana (2009) in their study in a Thai medical school reported some form of stress in 61.4% of the respondents (22). Stress was also seen in 31% of university students in a study conducted in three UK universities (23). Stress of moderate severity was also reported in 23.7% of Malaysian university students (24). In a recent study at another private Malaysian university, it was reported that 78.2%,12.9% and 8.9%

Table V: Relation of gender, age and ethnicity of students on the total stress score

Demographics						
Gender*	t value	Df		F		Sig (2-tailed)
Equal variances assumed	-1.510	1048		0.811		0.131
Age **	Sum of squares	Df	Mean square	F value		Sig (2-tailed)
Between groups	7773.516	2	3886.758	39.308		0.000*
Within groups	103527.460	1047	98.880			
Total	111300.976	1049				
Ethnicity**	Sum of squares	Df	Mean square	F value		Sig (2-tailed)
Between groups	3784.119	2	1892.060	18.356		0.000*
Within groups	106268.782	1031	103.074			
Total	110052.901	1033				

*Independent sample student t test, **One way ANOVA

+The mean difference significant at p<0.05

of the students had moderate, high and low stress levels respectively (10). Thereby, corroborate our results that stress still prevails among university students.

The present study showed that sleep indicators of stress were the most prevalent with 91.4% of the respondents perceiving it at high to dangerous levels. Many past researchers have documented sleep as one of the daily activities often affected by stress (10,25,26). According to Sadeh (2004), stress leads to hypervigilance which is incompatible with sleep (26). Poor sleep has alarming effects on the body from reduced cognitive abilities to cardiovascular diseases (10). In addition, 84.6% of the respondents perceived that they manifested many of the emotional indicators of stress. Especially, most students felt they worried a lot regarding their academics and finances; which was also reported by most of the local and international students in a similar study conducted in National University of Australia (6). On the other hand, Ramachandran & Dhanapal (2018) reported nervousness, anger and irritation as common emotional manifestations of stress in their study (10). In the present study, 75 % of the respondents reported manifesting with physical indicators and personal habits indicators at a high level. Among the physical indicators, chronic headache, smoking and fatigue were common manifestations. Burns (1991) too reported high levels of fatigue, gastrointestinal disturbances, eye twitching, heart pounding, various aches in head, back and stomach as manifestations of stress (6). In the current study, students perceived their inability to plan in advance as the main personal-habits indicator of stress. Behaviour indicators were the least common manifestation of stress in the present study with the total score at medium level. Working late, working on weekends and drinking alcohol were the highly scored items. Inadequate time for study and social life may contribute to this observation (10).

In the present study no significant difference was observed in the total stress scores of male and female university students. This is contrary to the findings of some previous studies which reported a female preponderance. This was attributed to social difficulties and psychological factors among female students (4,21,24). The age and ethnicity of the respondents showed a significant influence on the total stress score in this study. The younger students in the 18-24 years age group perceived stress more than the older groups. Various studies have also reported higher stress levels in students younger than 21 years (10,27). Researchers firmly believe that transition from school to university is not easy as there is a vast difference in the teaching-learning activities as well as the learning environment. The first-time experiences among the freshers at the university with demands to adjust to new environment, make new acquaintances in addition to academic commitments contributes to stress (28). This finding is however inconsistent with the findings of Shamshaudin

et al (2013) who argue that stress is greater in students of older age group as they are expected to be more committed towards achievement of academic goals (27). In the current study, Malay students were found to have higher total stress scores when compared to their Chinese and Indian peers. A similar observation was made by Shamsuddin et al (2013) in another study on psychological distress among university students in Malaysia. It was postulated that Malay students were more vulnerable to stress due to their cultural factors (27). Hence, cultural differences among ethnic groups impact the stress levels among university students. Likewise, freshers at the university are more vulnerable to stress. These need to be borne in mind while planning for remedial measures to curb stress among present-day university students in Malaysia.

The limitations of this study include the cross sectional study design with convenience sampling technique which limits the generalizability of the results. Besides, the study was conducted in only one university though students of different faculties of varied age group, gender and ethnicity were enrolled. Secondly, the inferences were drawn on the basis of a self-administered questionnaire. Hence, there is scope for social desirability bias.

Implications of this study are that this study made students aware of the different indicators of stress, to identify their own stress levels and take timely remedial actions. It provides useful data to policy makers, curriculum designers and teachers to focus on the academic achievement as well as the quality of life of the students with the aim to make university-days memorable and enjoyable phases of an individual's life.

CONCLUSION

Stress prevails among the 21st century university students. Each student manifests stress with different indicators. Sleep and emotional indicators predominate followed by the physical indicators of stress. Creating awareness about mental health, intervening early with good counselling services and implementing programs at the university focused on increasing social connection among the student community would go a long way to reduce stress among university students.

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