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Perceived stress and sources of stress among pharmacy students in Malaysian public and private universities: a comparative study

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Abstract

This study aimed to compare the level of stress and its associated factors among pharmacy students in a public university and a private university. A cross-sectional study was carried out recruiting all pharmacy students in two pharmacy faculties in Malaysia, using an online self-administered questionnaire in English. The questionnaire included questions on socio-demographic factors, sources of stress and the validated Perceived Stress Scale (PSS-10). The mean (±SD) age was 20.7 (± 1.2) years and the age ranged 19 - 29 years. The majority of respondents were female (79.6 %) and Malays (53.9 %). There was a significant association between PSS-10 and "study in general" and "assignments" (p<0.01), among students in the public university. In the private university, stress was significantly associated with "living cost (p=0.045), "living away from family" (p=0.043) and "lack of recreational time" (p=0.016). Exams, financial problems, peer competition and final projects, and fear of future were associated with stress among students in both universities. In conclusion, the pharmacy students perceived stress similar in public and private universities. Academic-related stressors were significant in public university, while life-related stressors were significant in private one.

Keywords: *Malaysia, perceived stress scale, pharmacy students, sources of stress*

Introduction

Health education is stressful and demanding. Stress occurs when an individual is confronted with a situation that is perceived as overwhelming and with which they cannot cope. In the academic setting, stress has gained a tremendous attention, particularly due to its negative impact on students' physical and mental health (Lundberg, 2003, Al-Dubai *et al*., 2013). Therefore, the topic of stress and stressors in education of health profession has been extensively investigated among medical (Gaughran *et al*., 1997; Al-Dubai *et al*., 2011; Giansante & Ballarini, 2012;), dentistry (Feinberg, 2001; Paharia, 2002) and nursing students (Giansante & Ballarini, 2012; Moreira & Furegato, 2013).

According to Dutta (Dutta *et al*., 2005), medical students faced the highest stress followed by dentistry and nursing respectively. Dutta et al had noted the lack of studies related to stress among pharmacy students. Meanwhile, a study comparing stress among medical, nursing, dentistry and pharmacy students revealed pharmacy students were more psychologically distressed than other health care disciplines (Henning *et al*., 1998). An interesting finding in the latter study was the regression analysis of the psychological stress which showed the mean difference of stress among the four disciplines was a function of the academic programme, rather than age, gender and other covariates. We hypothesise that pharmacy education, during the last two decades, has undergone a radical reform; perhaps similar to that which has occurred in medical, dentistry and nursing education as integrated health action towards drug safety and evidence based health care in developed (Katajavuori *et al*., 2009, Phillips *et al*., 2012) and developing countries (Khan, 2010).

In one study, students in private medical universities seemed to have higher stress prevalence than public ones (Saravanan & Wilks, 2014). The current study aimed to use the same tool for the measurement of stress –the

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perceived stress scale (PSS) – and compare stressors among pharmacy students in a well established public university compared to a pharmacy faculty in a private university college.

Study Design & Method

Using a universal sampling, this cross-sectional study was carried out among pharmacy students in two pharmacy faculties in Malaysia (N = 827); a private faculty (n = 185) and a public faculty (n = 642). Data collection was undertaken during the period of March 2010 until October 2010. The selection of these two pharmacy faculties was based on curricula similarities in contents and years of training.

Study instruments

This study used an online self-administered questionnaire in English in both faculties. The questionnaire was composed of three sections: Section A, included questions on socio-demographic data; Section B was composed of the validated 10-item Perceived Stress Scale (PSS-10). PSS-10 is used to measure the degree to which one perceived one's life as stressful. Here, the participants are asked to respond to each question on a 5-point Likert scale ranging from 0 (never) to 4 (very often), indicating how often they had felt stressful within the past month. The scores ranged from 0 to 40, where higher scores indicated greater perceived stress (Cohen *et al*., 1983). Section C, the sources of stress, consisted of 10 items that were derived by reviewing the literature and through discussion with a group of students (Al-Dubai *et al*., 2011). The questionnaire was pre-tested on ten students in each faculty before distributing to the subjects to ensure that the questionnaire was easily understood.

Data collection

The web link of the questionnaire was distributed to all academic years, via their batch emails with the cover letter. The cover letter informed the participants of the purpose of the study, the assurance of anonymity and the entitlement of the respondents to complete or decline the survey questionnaire. Approval of the study was obtained from the faculty of Pharmacy Research Committee (Cyberjaya University College of Medical Sciences).

Statistical analysis

Analysis was performed using Statistical Package of Social Sciences (SPSS®), software v.20. Descriptive analysis was conducted to obtain the frequencies, mean, median, and standard deviation. Test of Normality was conducted for the continuous variables. *T*-test and ANOVA test were used to compare means across variables. Pearson's correlation was used to assess the association between continuous variables. All analyses employed a significance level (*p*) below 0.05.

Results

A response rate of 46.9% was achieved (388 out of 827) for both pharmacy faculties. The response rate in private university (55.1%) and in public (44.5%). The age of pharmacy students who responded ranged from 19 to 29 years (mean 20.7 ± 1.2). The majority of respondents were female (79.6 %) and Malays (53.9 %; Table I).

The overall mean PSS score measured for pharmacy students was 30.4 (± 4.5). In the private university the PSS was 30.5 (± 4.4), while PSS mean of public pharmacy students was 30.3 (± 4.6). No statistically significant association between demographic data and PSS score was observed.

Table I: Demographic characteristic of participants

Variable		Public (%)	Private (%)	**Total**	**%**
Gender	Male	57 (19.9)	22 (21.6)	79	20.4
	Female	229 (80.1)	80 (78.4)	309	79.6
Race	Malay	142 (49.7)	67 (65.7)	209	53.9
	Chinese	126 (44.1)	17 (16.7)	143	36.9
	Indian	10 (3.5)	15 (14.7)	25	6.4
	Others	8 (2.8)	3 (2.9)	12	2.8
Academic year	1	56 (19.6)	26 (25.5)	82	21.1
	2	94 (32.9)	25 (24.5)	119	30.7
	3	83 (29.0)	26 (25.5)	109	28.1
	4	53 (18.5)	25 (24.5)	78	20.1
Separated parents	yes	15 (5.2)	9 (8.8)	24	6.2
	No	271 (94.8)	93 (91.2)	364	93.8
Smoking	Yes	4 (1.4)	1 (1.0)	5	98.7
	No	282 (98.6)	101 (99.0)	383	1.3
Alcohol	Yes	53 (18.5)	22 (21.6)	75	19.3
	No	233 (81.5)	80 (78.4)	313	80.7
Medications	Yes	6 (2.1)	6 (5.9)	21	3.1
	No	280 (97.9)	96 (94.1)	376	96.9

Pearson's correlations showed a significant correlation of PSS score with stressors such as 'study in general' ($r = 0.28$) ($p<0.01$) and 'assignments'($r = 0.34$) ($p < 0.01$), in public university. While rental costs ($r = 0.20$) ($p = 0.045$), 'living away' ($r = 0.20$) ($p = 0.043$) and lack of recreational time ($r = 0.24$) ($p = 0.016$) were stressors associated with pharmacy students in private university. Exams, financial problems, peer competition and final projects were stressors of both university students. While fear from future was significant in both universities its correlation among students of the private university was higher compared to public (Table III).

Table 2: *T*-test of demographic variables and perceived stress scale

Variable		n	Mean	SD	*p* value
Gender	Male	79	30.5	4.5	
	Female	309	30.4	4.6	0.77
Race	Malay	209	30.6	4.5	
	Chinese	143	30.1	4.6	
	Indian	25	29.6	4.4	
	Others	12	30.7	4.8	0.67
Academic year	1	82	30.3	4.9	
	2	119	30.3	4.1	
	3	109	30.4	4.8	
	4	78	30.6	4.7	0.98
Separated parents	Yes	24	31.2	5.0	
	No	364	30.3	4.6	0.44
Smoking	Yes	5	35.0	4.8	
	No	383	30.3	4.5	0.09
Alcohol	Yes	75	30.5	4.5	
	No	313	30.0	5.1	0.48
Medications	Yes	12	31.8	4.1	
	No	376	30.3	4.6	0.24

Table III: Correlation of stress scale and stressors among pharmacy students in public and private universities.

		Private	Public
Stress scale	Pearson Correlation	1	1
	N	102	286
Study in general	Pearson Correlation	0.19	0.28**
	Sig. (2-tailed)	0.05	0.01
Assignments	Pearson Correlation	0.19	0.32**
	Sig. (2-tailed)	0.05	0.01
Exams and grades	Pearson Correlation	0.35**	0.34**
	Sig. (2-tailed)	0.01	0.01
Peer competition	Pearson Correlation	0.27**	0.29**
	Sig. (2-tailed)	0.01	0.01
Financial problems	Pearson Correlation	0.21*	0.14*
	Sig. (2-tailed)	0.03	0.02
Living condition or rent	Pearson Correlation	0.20*	0.07
	Sig. (2-tailed)	0.04	0.22
Living away	Pearson Correlation	0.20*	0.07
	Sig. (2-tailed)	0.04	0.22
Fear of future	Pearson Correlation	0.53**	0.32**
	Sig. (2-tailed)	0.01	0.01
Lack recreation time	Pearson Correlation	0.24*	0.07
	Sig. (2-tailed)	0.02	0.25
Final projects or thesis	Pearson Correlation	0.39**	0.14*
	Sig. (2-tailed)	0.01	0.02

Correlation is significant at 0.01 (**) ,0.05 (*)

Discussion

To the best of our knowledge, this is the first study conducted among pharmacy students in Malaysia, to compare students' perceived stress and stressors, in private and public pharmacy universities.

The overall response rate in this study was 46.9%. The response rate of pharmacy students was acceptable. Low response rate is a common finding for studies utilising online questionnaires (Sandars & Walsh, 2009; De Faoite *et al*., 2013,). Low response rates had previously been observed among medical students (Wilkinson, 1998). The current study used the English version of PSS as the authors were working on the validity of the Malay version (Al-Dubai *et al*., 2012b) and because English language is the medium for instruction in both pharmacy faculties.

PSS-10 is a useful psychometric instrument to measure self-reported perception of stress. PSS was used due to the well reported reliability in Malaysia (Al-Dubai *et al*., 2012a) and worldwide (Lee, 2012). The scoring system of the instrument is not use for diagnosis (high, intermediate, low) of stress, rather it is used for a comparison of stress between two groups (Cohen *et al*., 1983). This cross-sectional study showed an overall PSS score of 30.4 ± 4.5, with no tangible difference between private and public universities. Also, the findings showed no association between perceived stress among pharmacy students and demographic factors such as age, gender, race, academic year and parental separation. Previous studies had reported female gender students as more likely to perceive stress than male students in work environments (Barbosa-Leiker *et al*., 2013). This observation produced controversial results among university students (Von Bothmer & Fridlund, 2005; Niemi & Vainiomaki, 2006). Therefore, the lack of association between perceived stress and the predominant female population in our study is consistent with other studies involved university students (Amr *et al*., 2008; Feldt & Updegraff, 2013). Moreover, both universities in the study provided mentoring programmes to their students that probably could mask gender differences during school period (Li *et al*., 2011).

Similarly, other variables such as smoking, alcohol and medication use did not show significant association with PSS score, despite, for example, the higher PSS score of pharmacy student smokers (35.0) compared to non-smokers (30.3); this may be due to the low number of participants who disclosed cigarette smoking. The prevalence of smoking among Malaysian university students was found to be 26.6% (Yusoff, 1994) which was higher than the level reported in the current study (1.3%). Alcohol use has been positively associated with perceived stress previously (Tavolacci *et al*., 2013) which was not consistent with our finding as Muslim students made up 53.9% of the study population. Another study done in Malaysia by Liew *et al.* showed that 21.3% of the students consumed alcohol (Liew *et al*., 2011).

In this study we identified ten stressors that showed significant correlation with students' perceived stress. The stressors such as exams and grades, fear of future, final

projects or thesis, financial problems, and peer competition were significantly correlated with perceived stress in both private and public university. These findings are congruent with other studies in Malaysia and elsewhere (Wolf *et al*., 1988; Bahri Yusoff, 2011). Living condition, living away, and lack of recreation time also showed significant correlation with students' perceived stress and this finding also supported with previous studies among nursing and medical students (Seyedfatemi *et al*., 2007; Al-Dubai *et al*., 2011).

Interesting differences between private and public pharmacy faculties in this study were the significant correlation of pharmacy students' perceived stress with academic-related stressors such as study in general and assignments in the public pharmacy faculty, a finding not observed in the private pharmacy faculty. This finding probably could be attributed to the preference of students to study in the public sector for a variety of reasons, such as: better job prospect, subsidised tuition fee and a better recognition. (Fernandez, 2010). The high competition for public universities are more likely to result in high performing students. This would likely result in a more academically competitive and stressful environment for students.

In contrast, pharmacy students' perceived stress in private faculty showed a significant correlation with life-related stressors such as living condition, living away and lack of recreation time which has not been observed in the public pharmacy faculty. These findings could be due to the lack of collage hostel which make the students under the pressure of paying high rental and utilities cost. Lack of indoor and outdoor recreational activities in the private university is another factor associated with stress. It has been reported in the literature that lack of recreational areas has been associated with stress (Lee *et al*., 2012); sports was considered as a strategy to cope with stress (Happell *et al*., 2013).

Strength and limitation

The strength of this study lies in determining the shared stressors facing Malaysian pharmacy students in general, as well as the different stressors affecting pharmacy students in private or public sectors. However, it should be noted that self-reported stress can be affected by the subjective status of the participant, as well as the online format of the questionnaire that was associated with low response rate. This study aimed to measure PSS only and the results would be more meaningful if the study had taken into account the strategies that the students use to cope with stress which may have given a better predictive value of whether the perception of stress does have any positive or negative impact on the learning process.

Conclusions

The pharmacy students perceived stress in both public and private universities. Academic-related stressors were significant in public university, while life-related stressors were significant in private one.

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Conflicts of Interest

The authors declare no conflict of interest.

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