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Prevalence, factors associated and coping strategies of stress among pharmacy students in a public university in Malaysia

Abstract

The study assesses the prevalence, factors associated with stress and the coping strategies among undergraduate pharmacy students in students in a Malaysian university. A cross-sectional survey was conducted among 345 undergraduate pharmacy students over a period of two weeks. Stress was assessed using the previously validated Perceived Stress Scale (PSS-10). A questionnaire consisting of 34 items was used to assess the stress factors and coping strategies. The prevalence of stress among undergraduate pharmacy students was relatively high (62.3%), especially among the first- and third-year students. Pressure to maintain good grades, continuous assessments, lecturers' teaching approaches, high number of subjects and credit hours, timetable/study schedule, extracurricular activities, financial problem, lack of leisure time, family and peer related problems, homesickness, difficulty in time management, sleep deprivation, lack of physical exercise, unhealthy eating pattern, accommodation or transport problem, feeling lonely and excess gadget usage were the factors found to be significantly associated with stress. Meditation, yoga or taichi, and emotional eating were among the common stress coping strategies. Almost two-third of the pharmacy students were categorised as stress which were mainly contributed by continuous assessments and examinations. Effective time management with a balance between academic and regular exercise reported as coping strategies.

Keywords: stress, undergraduate, pharmacy student, strategies, Malaysia

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Introduction

Stress is defined as the "mismatch between demands and the perceived ability to cope with these demands", and it affects individuals of all age groups.[1,2] In recent years, there is a growing appreciation with regards to stress among healthcare students.[3,4] There were higher incidence of mental health problems such as stress, anxiety and depressions reported among healthcare students than the general population.[5,6] Of which, preliminary evidence revealed that, stress level among pharmacy students is comparable to other students receiving healthcare training regardless from medical, dental or nursing.[7] Previous studies conducted in Asian countries like Indonesia and Pakistan have reported high prevalence of stress among undergraduate pharmacy students that are 48.4% and 58.9% respectively.[8,9] A similar trend was observed among Malaysian pharmacy students studying both in private and public universities.[10]

Stress can be compounded by external factors such as unexpected major events or changes in environment or internal factors (e.g. self-expectations, feelings, or attitudes).[11] Studies have shown that, common stressors reported by the undergraduate students include academic demands, adjustment to new environment, personal issues such as relationship problems, financial burden, and changes in the social and cultural aspect.[12] It has been postulated that, an optimal level of stress, or otherwise referred as 'favourable stress', can enhance learning.[13] However, excessive stress can lead to various physical and mental health issues.[14] It can reduce students' self-esteem, affects their academic achievement and negatively impact their future personal or professional development.[15,16] For example, high level of stress can compromise patients safety, through poor decision making and increased risk of medication error while they practice in the future.[17] Moreover, stress has been linked to increased suicidal cases,[18] drug and alcohol abuse[19] among students.

Many of the previous studies have focused on the sources of stress among medical, dentistry and nursing students.[20,21] A review of the literature has identified, with only a few that assessed stress among pharmacy students.[7] Highlighting, there is a lack of data which represents factor associated and coping strategies among the pharmacy students. An understanding of these factors could help in the planning of measures to reduce stress among the students. Hence, the primary objective of this study was to evaluate prevalence of psychological stress, factors associated with the perceived stress and strategies to cope stress among the pharmacy students in a public university.

Methods

A cross sectional survey using quantitative descriptive approach was carried out among undergraduate pharmacy students in a public university in the northern region of Malaysia over two weeks in March 2018 (Beginning of second semester and not during examination). Pharmacy students undergoing a four-year Bachelor of Pharmacy degree programme who agreed to participate in this survey were included. Those who were born before 1993, extended from graduating, and all students who were involved in pilot study were excluded. A clustered sampling method was applied by grouping the students according to their respective batches of Year 1, Year 2, Year 3 and Year 4. Then, 100 participants were selected from each of

those strata according to the inclusion criteria. The expected sample size was 398 based on the formula for estimation of prevalence with a confidence level of 95%, 5% marginal error and 5% non-response rate.[22]

A self-administered questionnaire consisting of 4 sections was used in this study. Face and content validation were conducted by two experienced researchers. Pilot study was conducted among 10 pharmacy students randomly selected from various batches. Each participant of this study was given about 10 to 15 minutes to complete the questionnaire. Section A gathers the demographic details including age, weight, height, gender, accommodation, race, year of study, cGPA, sleeping hours, alcohol consumption behaviour, and smoking status. In Section B, the 10-item version of Perceived Stress Scale (PSS-10), a validated, reliable instrument for measuring non-clinical levels of stress among university students by Cohen et al was adopted.[23] This section comprised of 10 questions that were rated using a 5-point Likert scale ranging from 0=Never, 1=Almost never, 2=Sometimes, 3=Fairly Often and 4=Often. The score for positively worded items which comprise question 4, 5, 7 and 8 are reversed into 0=4, 1=3, 2=2, 3=1 and 4=0. Total PSS score for each participant range between 0-40 points. A cut-off value of 20 was used where students with total PSS score more than or equal to 20 were defined as stressed, meanwhile those with score less than 20 were grouped as non-stressed.[23,24]

Section C consists 20 items to assess factors associated with stress among students obtained from previously published article using 5-point Likert scale.[25–27] Participants respond to each question by choosing from five typical responses; strongly disagree, disagree, neutral, agree or strongly agree. Similarly, Section D examined stress management strategies commonly practiced by students using 14 items on a 5-points Likert scale of not at all, not really, undecided, somewhat and very much. The list for this section was made based on the literature search and previously published study.[28] A binary scoring method is then used to evaluate responses for both Section C and D by using median score as cut-off. This method assigns two new categories of agree or disagree for each item.[29]

Data analysis was performed using SPSS version 24.0. Descriptive statistic was used to describe baseline characteristic of study population. Chi-square test and T-test were used for analyses of associations between variables with normally distributed data. Mann Whitney U-test was carried out to compare groups with non-normally distributed data. Logistic regression was used to test the association between significant variables from univariate analysis. Odds ratios (OR) and 95% confidence intervals (CI) were reported. A value of $P<0.05$ was considered statistically significant.

Results

In this study, a total response rate of 86.2% (345 out of 400) was achieved. The non-responders were 13.8%. The number of responses obtained was 86, 77, 95 and 87 students respectively from 1st, 2nd, 3rd, and 4th year of study in undergraduate pharmacy programme. The average age of participants ranged between 19 to 24 years (mean 21.6±1.3) with majority being female (77.4%) and Chinese ethnicity (43.8%) (Table 1).

The mean PSS score observed was 20.9±5.1, with over half of the pharmacy students identified to be under stress category (Table 2). This study revealed that 53.0% of the pharmacy students sometimes have been upset over something's that happen unexpectedly, whereas 49.0% of them reported sometimes they were unable to control important things in their life. The findings also showed that a large proportion (76.9%) of the pharmacy students sometimes or fairly often felt nervous and stressed in the preceding month and nearly half (47.0%) of them could not cope with all the things that they had to do. Nevertheless, 46.4% them reported that they sometimes felt confident on their ability to handle their personal problems, meanwhile 48.4% of them were sometimes able to control irritations in their life in the previous month. This study also unveiled almost half (46.1%) of the students sometimes get angry over things that are outside their control or they felt difficulties were piling up so high that they were not able to overcome them.

Table 1 Demographic characteristics of participants

Description	N (%)
Age(years)	*21.6 ± 1.3
19	5 (1.4)
20	86 (24.9)
21	73 (21.2)
22	81 (23.5)
23	86 (24.9)
24	14 (4.1)
BMI (kg/m2)	*21 ± 3.3
Underweight	47 (13.7)
Normal	259 (75.5)
Overweight	37 (10.8)
Race	
Malay	138 (40.0)
Chinese	151 (43.8)
Indian	39 (11.3)
Others	17 (4.9)
Gender	
Male	78 (22.6)
Female	267 (77.4)
Year of study	
Year 1	86 (24.9)
Year 2	77 (22.3)
Year 3	95 (27.5)
Year 4	87 (25.2)
Current cGPA	
>3.67	68 (19.9)
3.33-3.66	140 (40.9)

Table continue

Description	N (%)
3.00-3.32	95 (27.8)
2.67-2.99	37 (10.8)
<2.66	2 (0.6)
Sleeping hours	*6.3 ± 1.5
<7 hours	208 (61.4)
7-9 hours	123 (36.3)
>9 hours	8 (2.4)
Alcohol intake	
Yes	65 (18.8)
No	280 (81.2)
Smoker	
Yes	8 (2.3)
No	337 (97.7)

Abbreviation: N, frequency; BMI, body mass index
*, Mean±Standard deviation

Univariate analysis (Table 3) found that various factors including pressure to maintain good grades, continuous assessments, lecturers' teaching method or approaches, high number of subjects and credit hours, timetable/study schedule, extracurricular activities, financial problem, lack of leisure time, family and peer related problems, homesickness, difficulty in time management, sleep deprivation, lack of physical exercise, unhealthy eating pattern, accommodation or transport problem, feeling lonely and excess gadget usage were found to be significantly associated with stress among pharmacy undergraduate students ($p<0.05$). The result further indicates that 89.3% of the stressed pharmacy students agreed that continuous assessments as the major contributing factor for their stress, followed by lecturer's teaching method or approaches (85.6%).

In terms of stress coping strategies for both groups of stressed and non-stressed students (Table 4), most students reported meditation, yoga or tachi (67.0% vs 53.8%), and emotional eating (68.4% vs 56.2%) as the commonly practiced method to overcome their stress level. Interestingly, in the multivariate logistic regression model (Table 5), it was found that stress was particularly significant among Year 2 [OR 0.43 (95% CI 0.21-0.87)] and Year 4 pharmacy students [OR 0.48 (95% CI 0.23-0.99].

Table 2 Undergraduate pharmacy students' responses to perceived stress scale

Statement	Total N (%)
1. In the last month, how often have you been upset because of something that happened unexpectedly?	
Never	4 (1.2)
Almost never	41 (11.9)
Sometimes	183 (53.0)
Fairly often	83 (24.1)
Very often	34 (9.9)
2. In the last month, how often have you felt that you were unable to control the important things in your life?	
Never	4 (1.2)
Almost never	53 (15.4)
Sometimes	169 (49.0)
Fairly often	84 (24.3)
Very often	35 (10.1)
3. In the last month, how often have you felt nervous and "stressed"?	
Never	1 (0.3)
Almost never	19 (5.5)
Sometimes	133 (38.6)
Fairly often	132 (38.3)
Very often	60 (17.4)
4. In the last month, how often have you felt confident about your ability to handle your personal problems?	
Never	7 (2.0)
Almost never	31 (9.0)
Sometimes	160 (46.4)

Table continue

Statement	Total N (%)
Fairly often	120 (34.8)
Very often	27 (7.8)
5. In the last month, how often have you felt that things were going your way?	
Never	5 (1.4)
Almost never	42 (12.2)
Sometimes	189 (54.8)
Fairly often	95 (27.5)
Very often	14 (4.1)
6. In the last month, how often have you found that you could not cope with all the things that you had to do?	
Never	6 (1.7)
Almost never	75 (21.7)
Sometimes	162 (47.0)
Fairly often	84 (24.3)
Very often	18 (5.2)
7. In the last month, how often have you been able to control irritations in your life?	
Never	3 (0.9)
Almost never	38 (11.0)
Sometimes	167 (48.4)
Fairly often	118 (34.2)
Very often	19 (5.5)
8. In the last month, how often have you felt that you were on top of things?	
Never	18 (5.2)
Almost never	73 (21.2)
Sometimes	182 (52.8)
Fairly often	67 (19.4)
Very often	5 (1.4)
9. In the last month, how often have you been angered because of things that were outside of your control?	
Never	9 (2.6)
Almost never	70 (20.3)
Sometimes	159 (46.1)
Fairly often	85 (24.6)
Very often	22 (6.4)
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?	
Never	8 (2.3)
Almost never	57 (16.5)
Sometimes	159 (46.1)
Fairly often	96 (27.8)
Very often	25 (7.2)

Abbreviation: N, frequency

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Table 3 Comparison of stressors and perceived stress scale among stressed and non-stressed group of the undergraduate pharmacy students

Factors associated with stress	Non-stress (n=130)	Stress (n=215)	p value
	N (%)	N (%)	
Examinations	111 (85.4)	191 (88.8)	.347
Pressure to maintain good grades	92 (70.8)	178 (82.8)	.009*
Continuous assessments	100 (76.9)	192 (89.3)	.002*
Lecturers' teaching method or approaches	93 (71.5)	184 (85.6)	.001*
High number of subjects and credit hours	77 (59.2)	158 (73.5)	.006*
Timetable/study schedule	61 (46.9)	146 (67.9)	<.001*
Extracurricular activities	65 (50.0)	132 (51.4)	.038*
Financial problem	66 (50.8)	151 (70.2)	<.001*
Lack of leisure time	51 (39.2)	124 (57.7)	.001*
Family and peer related problems	48 (36.9)	129 (60.0)	<.001*
Homesickness	66 (50.8)	138 (64.2)	.014*
Difficulty in time management	61 (46.9)	150 (69.8)	<.001*
Sleep deprivation	62 (47.7)	128 (59.5)	.032*
Lack of physical exercise	93 (71.5)	176 (81.9)	.025*
Unhealthy eating pattern	74 (56.9)	157 (73.0)	.002*
Accommodation or transport problem	70 (53.8)	142 (66.0)	.024*
Being in a relationship	97 (74.6)	152 (70.7)	.431
Feeling lonely	52 (40.0)	146 (67.9)	<.001*
Bullying or ragging	63 (48.5)	103 (47.9)	.92
Excess gadget usage	79 (60.8)	162 (75.3)	.004*

Abbreviation: N, frequency

Chi Square Test

*Significant with p value < 0.05

Table 4 Comparison of strategies to overcome stress among stressed and non-stressed undergraduate pharmacy students

Strategies to overcome stress	Non-stress (n=130)	Stress (n=215)	p value
	N (%)	N(%)	
Mentorship program with lecturers	61 (46.9)	119 (55.3)	0.129
Practice meditation, yoga or taichi	70 (53.8)	144 (67.0)	0.015
Doing some exercise	93 (71.5)	162 (75.3)	0.435
Joining sports or physical activities	93 (71.5)	159 (74.0)	0.624
Spend more time with friends and family	66 (50.8)	116 (54.0)	0.566

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Table continue

Strategies to overcome stress	Non-stress (n=130) N (%)	Stress (n=215) N(%)	p value
Involve in religious activity	80 (61.5)	147 (68.4)	0.195
Use a daily planner	81 (62.3)	128 (59.5)	0.61
Listening to music	64 (49.2)	119 (55.3)	0.27
Travelling or going for a vacation	57 (43.8)	117 (54.4)	0.057
Reduce gadget dependency	60 (46.2)	111 (51.6)	0.324
Getting a proper sleep	65 (50.0)	128 (59.5)	0.084
Emotional eating	73 (56.2)	147 (68.4)	0.022
Seek help of psychotherapist	80 (61.5)	154 (71.6)	0.052
Alcohol or drug use	34 (26.2)	78 (36.3)	0.052

Abbreviation: N, frequency

Chi Square Test

Table 5 Odd ratios (95% CI) of demographic and perceived stress scale

Variables		N	p value	OR	(95% CI)
Race	Malay	138	0.414	1	
	Chinese	151	0.69	0.88	0.47-1.64
	Indian	39	0.154	1.88	0.79-4.46
	Others	17	0.98	0.99	0.3-3.32
Year of study	Year 1	86	0.026	1	
	Year 2	77	0.019	0.43	0.21-0.87
	Year 3	95	0.865	0.94	0.47-1.88
	Year 4	87	0.048	0.48	0.23-0.99
cGPA	>3.67	68	0.206	1	
	3.33-3.66	140	0.771	0.91	0.48-1.74
	3.00-3.32	95	0.21	1.7	0.74-3.88
	2.67-2.99	37	0.141	2.28	0.76-6.82
	<2.66	2	0.642	0.5	0.03-9.35
Sleeping hours		339	0.221	0.9	0.76-1.07

Abbreviations: N, frequency; OR, odd ratio; CI, confidence interval

Discussion

This is the first study which comprehensively examined the perceived psychological stress, factors associated and provide strategies to manage stress among undergraduate pharmacy students of different academic year. Notably, an exceptionally high number of students (62.3%) are under stress due to one or more factors in this study. The result outweigh previous reports on stress prevalence among medical students which ranges between 30% to 50%.[21,30,31] However, the mean PSS score observed in this group was less in comparison to previous studies conducted among pharmacy students in the United Kingdom (UK)[32] and United States (US)[33] whereby they have reported a mean PSS score of 26.01±7.94 and 26.5±8.1 respectively.

Consistent with previous findings,[12] it is evident in this study that academic related factors remains the predominant cause of stress in most students, followed by physical, social, and emotional. Most of the student felt stress due to the continuous assessments, pressure to maintain good grades and the lecturers' teaching method or approaches. This trend is similarly reported in other studies conducted in the US, India, and Thailand; highlighting examinations and amount of taught content throughout the academic session as main perceived stressors by students.[34,35] On top of that, experiential learning activities, continuous assessment method such as Objective Structured Clinical Examination (OSCE), case presentations and clinical case report would have added to stress among pharmacy students in particular.[36,37] The total credit hours in pharmacy programme to be achieved by students are higher (145 units) as compared to other science courses (120-122 units). Academic competence, test competence, good time management skills are additional challenges to be dealt with especially with the amount of reading materials during test or exams.[38]

In this study, it was also found that, that majority of the undergraduate pharmacy students have inadequate sleeping hours of less than 7 hours. Sleep deprivation have been well correlated a source of stress which could cause students to lose focus on their studies and leads to poor performance.[39] Besides, a huge proportion of students perceived lack of physical exercise, excess gadget use, and unhealthy eating pattern as other stress contributing factors. Exercising could reduce body's stress hormone such as cortisol and adrenaline, while stimulate endorphins production that acts as a mood elevator and provides feeling of relaxation.[40] Sports such as badminton, football, swimming regularly could improve quality of life and alleviate stress more effectively.[41] The university or faculty could take initiatives by organizing weekly physical activities or aerobics or other stress reducing programmes for the students which could benefit the students by balancing their academic and non-academic life. Besides, first time living away from the family may bring social isolation and adds to personal vulnerability especially among first year students to adapt to new environment and challenges. Therefore, students may turn to less healthy and obesogenic dietary behaviours as a means of coping with stress. High perceived stress has been linked with worse diet quality, greater intake of snack foods, lower intake of fruits, increased disinhibition, and binge eating.[42] Nevertheless, it was interesting to identify that, nearly half of the students reported emotional eating can help them to cope with stress. There were also students whom prefer to perform meditation and yoga to enhance their concentration power and to relax.

A noteworthy observation in this study is that, the first- and third-year students were reported to be most stressful group as compared students in other academic years. This could be due to adaptation difficulty for shift from the traditional teacher-centred learning approach to self-directed learning as they progress into next academic year.[43] Moreover, third year comprises mainly clinical based subjects and the transition to experiential learning activities could have elevated the stress. Although the benchmark score set to pass each of the pharmacy courses were only 52% (grade B-), some of these students may struggle to achieve the target and attain best cumulative grade point average (cGPA) possible in their studies therefore contributing to the elevation of their stress level.

There are several limitations in this study that need to be considered. Firstly, the findings of this study may not be pertinent for generalization among students from universities from other Asian countries as their pharmacy education system and curriculum may differ accordingly. Moreover, this study did not evaluate the cause and effect relationship of the perceived stress among the students with coping strategies. Besides, information on students' history of mental or psychiatric disorders, neurological diseases, diabetes, hypertension or history of drug use for anxiety, sleep, medicinal plants, herbs and others were not collected which may affect the interpretation of the finding. Finally, the possibility of biasness among the non-respondents was not addressed.

Conclusion

Overall, prevalence of stress among the undergraduate pharmacy students was high. Main stressors identified were academic related such as examinations, continuous assessments, pressure to maintain good grades and the lecturer's teaching method or approaches. Yoga, meditation, and taichi or emotional eating were among the commonly practiced stress coping strategies reported by pharmacy students. Identification of stress contributing factors and coping strategies are important to enable provision of supportive learning environment to enhance students' ability to perform better academically as well as alleviate their stress.

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Ethical approval

The approval to conduct this undergraduate clinical study was provided by the Human Ethics Committee of the USM School of Pharmaceutical Sciences before the commencement of data collection. Only students who were willing to participate in this study were involved and informed written consent was obtained from them once they have understood the study purpose and objectives clearly.

Conflicts of interest

Authors declare that there is no conflict of interest.

References

1. Nivetha BM, Ahmed M, Prasantha B. Perceived stress and source of stress among undergraduate medical students of Government Medical College, Mysore. *Int J Community Med Public Health*. 2018;5(8):3513–3518.

2. Vine SJ, Moore LJ, Wilson MR. An Integrative Framework of Stress, Attention, and Visuomotor Performance. *Front Psychol*. 2016;7:1671.
3. Jacob T, Itzchak EB, Raz O. Stress among healthcare students-a cross disciplinary perspective. *Physiother Theory Pract*. 2013;29(5):401–412.
4. Dahlqvist V, Söderberg A, Norberg A. Dealing with stress: Patterns of self-comfort among healthcare students. Nurse Educ Today. 2008;28(4):476–484.
5. Teh CK, Ngo CW, Zulkifli RA, et al. Depression, Anxiety and Stress among Undergraduate Students: A Cross Sectional Study. *Open J Epidemiol*. 2015;5:260–268.
6. Shamsuddin K, Fadzil F, Ismail WSW, et al. Correlates of depression, anxiety and stress among Malaysian university students. *Asian J Psychiatry*. 2013;6(4):318–323.
7. Sun SH, Zoriah A. Assessing Stress among Undergraduate Pharmacy Students in University of Malaya. *Indian J Pharm Educ Res*. 2015;49(2):99–105.
8. Zamroni Z, Hidayah N, Ramli M, et al. Prevalence of academic stress among medical and pharmaceutical students. *Eur J Educ Stud*. 2018;4(10):256–266.
9. Yasmin R, Asim SS, Ali HA, et al. Prevalence of Perceived Stress among Pharmacy Students in Pakistan. *Int J Pharm Sci Rev Res*. 2013;23(2):343–347.
10. Alshagga MA, Nasir NZM, Behzadnia A, et al. Perceived stress and sources of stress among pharmacy students in Malaysian public and private universities: a comparative study. *Pharm Educ*. 2015;15(1):64–68.
11. Oken BS, Chamine I, Wakeland W. A systems approach to stress, stressors and resilience in humans. *Behav Brain Res*. 2015;282:144–154.
12. Bedewy D, Gabriel A. Examining perceptions of academic stress and its sources among university students: The Perception of Academic Stress Scale. *Health Psychol Open*. 2015;2(2):2055102915596714.
13. Kaplan HI, Saddock BJ. *Sypnosis of Psychiatry: Behavioral Sciences/ Clinical Psychiatry*. In: Learning Theory. 8th ed. Philadelphia: Lippincott Williams & Wilkins; 2000. 148–154 p.
14. Shankar NL, Park CL. Effects of stress on students' physical and mental health and academic success. *Int J Sch Educ Psychol*. 2016;4(1):5–9.
15. Edwards D, Burnard P, Bennett K, et al. A longitudinal study of stress and self-esteem in student nurses. *Nurse Educ Today*. 2010;30(1):78–84.
16. Sohail N. Stress and academic performance among medical students. *J Coll Physicians Surg Pak*. 2013;23(1):67-71.
17. West CP, Huschka MM, Novotny PJ, et al. Association of perceived medical errors with resident distress and empathy: a prospective longitudinal study. *JAMA*. 2006;296(9):1071-1078.
18. Moir F, Yielder J, Sanson J, et al. Depression in medical students: current insights. *Adv Med Educ Pract*. 2018;9:323–333.
19. Pickard M, Bates L, Dorian M, et al. Alcohol and drug use in second-year medical students at the University of Leeds. *Med Educ*. 2000;34(2):148–150.
20. Murphy RJ, Gray SA, Sterling G, et al. A comparative study of professional student stress. *J Dent Educ*. 2009;73(3):328–337.
21. Yusoff MSB, Abdul Rahim AF, Yaacob MJ. Prevalence and Sources of Stress among Universiti Sains Malaysia Medical Students. *Malays J Med Sci MJMS*. 2010;17(1):30–37.
22. Naing L, Winn T, Rusli BN. Practical Issues in Calculating the Sample Size for Prevalence Studies. *Archives of Orofacial Sciences*. 2006;1:9–14.
23. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav*. 1983;24(4):385–396.
24. Cohen Perceived Stress. http://podcast.uctv.tv/webdocuments/COHEN-PERCEIVED-STRESS-Scale.pdf. Accessed December 29, 2018.
25. Beall JW, DeHart RM, Riggs RM, et al. Perceived Stress, Stressors, and Coping Mechanisms among Doctor of Pharmacy Students. *Pharmacy*. 2015;3(4):344–354.
26. Moayedi F, Bastami MM, Ashouri FP, et al. Comparison of Sources and Severity of Perceived Stress between Paramedical and Medical Students. *Int J Med Res Health Sci*. 2016;5(6):183–190.
27. Bataineh MZT. Academic Stress among Undergraduate Students: The Case of Education Faculty at King Saud University. *International Interdisciplinary Journal of Education*. 2013;2(1):82–88.
28. Canales-Gonzales PL, Kranz PL. Perceived Stress by Students in a Pharmacy Curriculum. *Education*. 2008;129(1):139–146.
29. Sullivan GM, Artino AR. Analyzing and Interpreting Data From Likert-Type Scales. *J Grad Med Educ*. 2013;5(4):541–542.
30. Dyrbye LN, Thomas MR, Shanafelt TD. Medical student distress: causes, consequences, and proposed solutions. *Mayo Clin Proc*. 2005;80(12):1613–1622.
31. Sidik M. Prevalence of emotional disorders among medical students in a Malaysian university. *Asia Pacific Family Medicine*. 2003;2(4):213–217.
32. Gallagher CT, Mehta ANV, Selvan R, et al. Perceived stress levels among undergraduate pharmacy students in the UK. *Curr Pharm Teach Learn*. 2014;6(3):437–441.
33. Marshall LL, Allison A, Nykamp D, et al. Perceived Stress and Quality of Life Among Doctor of Pharmacy Students. *Am J Pharm Educ*. 2008;72(6):137.
34. Votta RJ, Benau EM. Sources of stress for pharmacy students in a nationwide sample. *Curr Pharm Teach Learn*. 2014;6(5):675–681.
35. Saipanish R. Stress among medical students in a Thai medical school. *Med Teach*. 2003;25(5):502–506.
36. Longyhore DS. Pharmacy Student Anxiety and Success With Objective Structured Clinical Examinations. *Am J Pharm Educ*. 2017;81(1):7.
37. Sheikh Ghadzi S, Noor S, Md Hanafiah NH. Stress Level Among Final Year USM Bachelor Of Pharmacy Students During Outpatient/ Counselling Clerkship. *International Journal of Pharmacy Teaching & Practices*. 2011;2(1):39–45.
38. Azmi N. Internal factors Affecting Academic Performance among Pharmacy Students in Malaysian Public Institutions of Higher Learning. *Indian J Pharm Educ Res*. 2014;48(3):26–33.
39. Zeek ML, Savoie MJ, Song M, et al. Sleep Duration and Academic Performance among Student Pharmacists. *Am J Pharm Educ*. 2015;79(5):63.
40. Heijnen S, Hommel B, Kibele A, et al. Neuromodulation of Aerobic Exercise-A Review. *Front Psychol*. 2016;6:1890.
41. Garber MC. Exercise as a Stress Coping Mechanism in a Pharmacy Student Population. *Am J Pharm Educ*. 2017;81(3):50.
42. Richardson AS, Arsenault JE, Cates SC, et al. Perceived stress, unhealthy eating behaviors, and severe obesity in low-income women. *Nutr J*. 2015;122:14.
43. Salam A, Mahadevan R, Abdul Rahman A, et al. Stress among First and Third Year Medical Students at University Kebangsaan Malaysia. *Pak J Med Sci*. 2015;31(1):169–173.