



Stress Level Among Final Year USM Bachelor Of Pharmacy Students During Outpatient/Counselling Clerkship

Siti Maisharah S.G, Sabariah Noor H, Nur Hafzan M.H

School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang

Research Article

Please cite this paper as: Siti Maisharah S.G, Sabariah Noor H, Nur Hafzan M.H. Stress Level among Final Year USM Bachelor of Pharmacy Students during Outpatient/Counselling Clerkship. *IJTP*, 2011, 2 (1), 39-45.

Corresponding Author:

Siti Maisharah S.G
Clinical Pharmacy Discipline,
School of Pharmaceutical Sciences,
11800 Universiti Sains Malaysia,
Penang
Telephone No: 609-7671187
Fax No: 609-7671199, e-mail address: maisharah@usm.my

Abstract

Objective: Stress is common among university students, but this condition may sometimes be beyond expectation and may interfere with academic performance, emotional or even health outcome. The objectives were to measure and to examine the difference between perceived stress level before (pre) and after (post) clerkship; and also to explore the possible stress triggers, strategy to cope stress as well as the suggestions to alleviate stress.

Methods: The samples of this study were all of 67 students, whom divided into 7 groups and assigned to Outpatient/Counselling Clerkship in Hospital Universiti Sains Malaysia for 7 consecutive weeks. They were given a set of questionnaire at the first and the last day of clerkship. The stress level was measured using 14-item Perceived Stress Scale (PSS-14). The subjects were given 10 minutes to fill in the questionnaire before collected by the researcher. The data analyzed by SPSS 18.0.

Results: The total of PSS score pre clerkship was higher with mean of 29.08 (SD 7.91) as compared to post clerkship score with mean value of 27.70 (SD 6.86). However, this difference was not statistically significant ($p>0.05$). Most common stress trigger was 'clerkship assignment and assessment' ($n=53$, 84.1%). 'Napping and sleeping' ($n=59$, 93.7%) were reported as the most effective ways to cope with stress. The most agreed suggestions to alleviate stress was to 'improve and expand wireless internet in pharmacy and library building' ($n=63$, 96.8%).

Conclusion: Stress level decreased by 4.75% after clerkship finished, but not statistically significant. Higher cohort samples needed. Suggestions from students to alleviate stress need to be reviewed and considered.

Keywords: perceived stress level, bachelor of pharmacy student, pharmacy clerkship, stress trigger, strategy to cope with stress, suggestion to alleviate stress

Introduction

Stress is a common condition experienced by university and college students, but, if the amount is beyond expectation, it might interfere with daily activities and produce negative effects in academic, emotional or health aspects. [1] Stress in university caused by many reported factors, such as academic related to assignments, financial issue, environment, time and interpersonal issue. [2-4]

Quite a number of studies examine the impact of stress on the quality of life. For example, findings from studies by Leisa LM et al, Gupchup GV et al, Jan DH et al, showed negative impact on stress to mental Health-Related Quality of Life (HRQOL) in Pharm D students; in which low mental HRQOL related to higher stress level. [2,5-7] A study on the undergraduate also showed that the scores of stress were positively related with the scores of depression. Both scores also were negatively related with the scores of quality of life in physical and mental parts. [8]

Besides the impact of stress to quality of life, few investigations also study the effects of stress to academic performance of students. A study by Stewart et al resulted in negative relationship between academic performance before and during medical school and stress level. [9] Another study by Diane SK et al reported that early adolescent school-related stress negatively affected academic performance 3 years later.[10]

In conjunction, investigations on stress were crucial, in order to overcome the possible negative outcomes, especially in health professional university students, including medical, dental, pharmacy and nursing students. [2,5-7,11-17]. However, there were lack of stress study on undergraduates of pharmacy students, and more were focused on the postgraduates.

For the final year bachelor of pharmacy students, especially in Universiti Sains Malaysia, students were required to undergo an internship or clerkship as a preparation to be a future pharmacist, in which they will be attached to a different pharmacy department's site, including Outpatient/Counselling Clerkship.[18] Unfortunately, there was still no published study on the stress level of students during the said most important period of a student's pharmacy life, despite so many concerns on impact of stress level on the student's quality of life. Thus, this study was built with the rationals to: (1) study the level students' perceived stress level in pharmacy undergraduates who underwent Outpatient



(OPD)/Counselling Clerkship; (2) determine the difference of the perceived stress level among all subjects pre and post clerkship; (4) understand the difference of each stress condition pre and post clerkship; and (5) explore the possible stress triggers, strategy to cope stress as well as the suggestions to alleviate stress.

Methodology:

This study was a prospective cross sectional study and the sampling technique used was universal sampling. In this study, 67 final year students of Science Pharmacy Universiti Sains Malaysia were invited to participate in this study. The students were all of those who underwent one semester of Outpatient/Counselling Clerkship in Hopsital Universiti Sains Malaysia, arranged by the Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, Universiti Sains Malaysia Health Campus, from 29/8/2010 until 28/10/2010. All 67 students agreed to be the subjects of this study by filling and signing in the inform consent given earlier.

The subjects also divided into 7 groups, consisting from 9 to 10 students per group. Each group will be assigned to Outpatient/Counselling Clerkship for each different week. They were given a set of questionnaire at the first day prior to the clerkship briefing, and at the last day of clerkship just after finishing the last activity for that day. The subjects were given 5-10 minutes to fill in the questionnaire before collected by the researcher.

The questionnaire built up of 3 main sections, which are Section 1, Section 2 and Section 3. Section 1 contained 12 questions on required demographic data of the subjects. Section 2 consists of 14 questions of established validity and reliability Perceived Stress Scale (PSS-14) with 5-point Likert Scale ranking for the answers, used to measure the perceived stress level.[19] 7 questions that related to negative responses were scored in reverse manners. Total score ranges from 0-56, in the sense of higher perceived stress level indicated by higher total PSS score. The written permission to use this PSS-14 was already obtained from the authors. The last section, which was Section 3 meant for questions for assessing the presence of stress triggers, strategy to cope stress and also the suggestions to alleviate the stress. The questions were obtained from a study by Leisa LM et al, and modified to close-ended questions.[2]

Face and content validations for each question done by lecturers and pharmacists. The data then entered into SPSS 18.0 and analyzed using proper statistical analysis. Descriptive analysis used to determine the frequency of every demographic data variable, total score of individual PSS, each PSS questions, stress triggers, strategy to cope stress and also the suggestion to alleviate stress.

Variation in individual PSS score according to the gender, availability of transportation, presence of self- health problem, and presence of family health problem measured for the differential significance by using student

t-test. Mean PSS score differences according to age, race, clerkship group, residence, average daily commute from residence to school, and regular exercise per day within the last week were tested using one way Anova test for the significance. Besides, the Wilcoxon Signed Rank Test used to compare the mean of total pre-clerkship and post-clerkship PSS score. The Wilcoxon Signed Rank Test also used to measure the significant difference of mean PSS score of pre-clerkship and post-clerkship for each PSS questions.

Results:

All 67 students responded to the questionnaire, which produce the response rate of 100%. Table 1 summarized the socio-demographic data of the subject, Table 2 consists of descriptive results and statistical difference of PSS questionnaire score, and Table 3 meant for the descriptive analysis of the stress triggers, strategy to cope stress and suggestions to alleviate or reduce the stress condition.

None of the independent variables possessed a significant difference among the studied groups, which were gender, age, race, clerkship group or week, residences, average daily commute from residence to school, availability of transportation, presence of self and family health problem, and exercise habits. This showed that perceived stress was not merely associated with the difference of any said independent variables.

For the PSS score of the whole sample, pre clerkship PSS score was 29.08 (SD 7.91) reported to be higher than PSS score of post clerkship that was 27.70 (SD 6.86). However, this 4.75 % decrement of stress level was not supported by significant statistical difference ($p > 0.05$). This resembles that even though stress level decreased at the last day of clerkship as compared to the first day, it was not really a matter of difference.

The comparison between mean score of pre clerkship and post clerkship PSS score for each question or stress condition was summarized in Table 2. The stress level was examined and measured by using 14 item-Perceived Stress Scale by Cohen, et.[19] The Cronbach α reported for Pre Clerkship PSS Score was 0.902, and for the post clerkship was 0.873, among this research's sample.

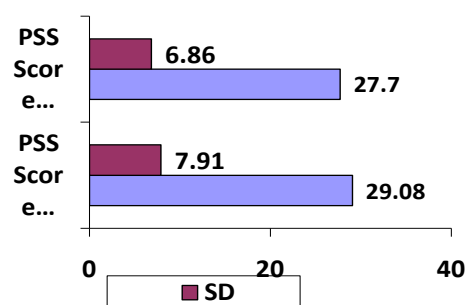


Figure 1 : Comparison between Mean and Standard Deviation of Pre Clerkship and Post Clerkship PSS Score for the Whole Sample ($p > 0.05$)



Table 1: Sociodemographic Data and Mean of Post Clerkship Perceived Stress of Final Year Pharmacy Students in a survey to Measure the Perceived Stress (N=67)

with $p < 0.006$. Because of this question was reversely coded, it means that the ability of students to dealt successfully with problems and annoyance was lower post clerkship, thus the level of stress is higher as compared to pre clerkship.

| Variable | No (%) | MEAN Perceived Stress (SD) | Significance |
|---|------------|----------------------------|--------------|
| Gender | | | *NS |
| Male | 15 (22.4) | 27.75 (4.31) | |
| Female | 52 (77.6) | 27.69 (7.38) | |
| Age | | | *NS |
| 21 | 7 (10.4) | 27.33 (3.44) | |
| 22 | 43 (64.2) | 28.18 (1.19) | |
| 23 | 16 (23.9) | 25.63 (5.04) | |
| 24 | 1 (1.5) | 45.00 | |
| Race | | | *NS |
| Malay | 15 (22.4) | 27.23 (6.65) | |
| Chinese | 51 (76.1) | 27.49 (6.62) | |
| Eurasian | 1 (1.5) | 44.00 | |
| Clerkship group | | | *NS |
| First group | 9 (13.4) | 24.78 (6.61) | |
| Second group | 9 (13.4) | 30.11 (6.62) | |
| Third group | 10 (14.9) | 25.30 (4.62) | |
| Fourth group | 10 (14.9) | 25.30 (4.62) | |
| Fifth group | 10 (14.9) | 33.00 (12.03) | |
| Sixth group | 10 (14.9) | 25.71 (2.43) | |
| Seventh group | 9 (13.4) | 31.00 (6.86) | |
| Residence | | | *NS |
| Nurani | 13 (19.4) | 27.60 (4.25) | |
| Ten Ten | 50 (76.1) | 27.60 (7.43) | |
| Rental House | 3 (4.5) | 29.67 (4.93) | |
| Average Daily Commute from Residence to School | | | *NS |
| 1-2 Times | 48 (71.6) | 26.89 (5.55) | |
| 3-4 times | 14 (20.9) | 29.17 (9.59) | |
| >4 times | 5 (7.5) | 31.40 (9.52) | |
| Availability of Transportation | | | *NS |
| Yes | 7 (10.4) | 25.71 (5.12) | |
| No | 60 (89.6) | 27.96 (7.05) | |
| Presence of Self Health Problem | | | *NS |
| Yes | 4 (6.0) | 29.50 (2.51) | |
| No | 63 (94.0) | 27.57 (7.05) | |
| Presence of Family Health Problem | | | *NS |
| Yes | 35 (52.2) | 26.90 (7.05) | |
| No | 32 (47.8) | 28.53 (6.68) | |
| Smoking Cigarettes | | | *NS |
| Yes | 0 (0.0) | - | |
| No | 67 (100.0) | 28.00 (6.87) | |
| Regular Exercise per Day within Last Week | | | *NS |
| No | 50 (74.6) | 28.25 (7.04) | |
| 1-10 minutes per day | 3 (4.5) | 21.33 (6.11) | |
| 11-20 minutes per day | 6 (9.0) | 29.60 (4.21) | |
| 21-30 minutes per day | 5 (7.5) | 26.80 (5.07) | |
| 31-40 minutes per day | 2 (3.0) | 16.00 | |
| >40 minutes per day | 1 (1.5) | 20.00 | |

Question 4 regarding student's ability to dealt successfully with day to day problems and annoyances showed higher for post clerkship mean PSS score, which was 1.87 (SD 0.735) as compared to mean pre clerkship mean PSS score valued 1.67 (SD 0.762). This result supported by statistical significant different between those aforementioned issue

On the other hand, question 11 showed higher level of stress for pre clerkship than post clerkship. This was because, the mean PSS score for question 'In the last week, how often have you been angered because of things that happened that were outside of your control?'



reported higher results for pre clerkship that was 2.03 (SD 1.015) than post clerkship, which was 1.69 (SD 0.801).

The difference was significant with $p < 0.05$. This result clearly pictured that there was less uncontrollable things that happened during clerkship that stimulate student anger for the whole clerkship week. Other stress questions or items seemed to be not statistically significance for mean PSS score differences between pre and post clerkship.

Table 3: Post Clerkship Stress Triggers, Strategies to Cope Stress and Suggestions to Alleviate Stress (N=63)

| No | Components | Yes N (%) | No N (%) |
|---|--|--------------|-------------|
| <i>C.1: Stress triggers</i> | | | |
| 1 | Family and relationships | 22 (34.9) | 41 (65.1) |
| 2 | Examinations and tests | 44 (69.8) | 19 (30.2) |
| 3 | First day clerkship at Hospital | 27 (42.9) | 36 (57.1) |
| 4 | Assignments and assessments | 53 (84.1) | 10 (15.9) |
| 5 | Financial concerns | 19 (30.2) | 44 (69.8) |
| <i>C.2: Effective activities or strategies employed to cope with stress</i> | | | |
| 1 | Exercising (running or working-out) | 39 (62.9) | 23 (37.1) |
| 2 | Time with family and friends | 58 (92.1) | 5 (7.9) |
| 3 | Napping/sleeping | 59 (93.7) | 4 (6.3) |
| 4 | Watching TV | 33 (52.4) | 30 (47.6) |
| 5 | Drinking alcohol | 2 (3.2) | 60 (96.8) |
| <i>C.3: Suggestions for administrative changes in the pharmacy clerkship program or on the campus to alleviate stress</i> | | | |
| 1 | Improve and expand wireless internet, computer labs with sufficient computers and printers in pharmacy and library buildings | 61 (96.8) | 2 (3.2) |
| 2 | Increase teaching by the experienced professors on faculty | 53 (84.1) | 10 (15.9) |
| 3 | Improve gym facilities – equipment room and locker room | 51 (81.0) | 12 (19.0) |
| 4 | Concurrent lectures and clerkship throughout the semester | 38 (60.3) | 25 (39.7) |
| 5 | Improve accommodation and transportation means in the University | 58 (93.5) | 4 (6.5) |

In conjunction, in order to understand the most common post clerkship stress triggers, strategy to cope stress, and suggestions to alleviate or reducing stress, Table 3 had been produced. The most common stress triggers as described was assignment and assessment in the clerkship, which was positively answered by 84.1% subjects (n=44). This was followed by examination and stress (n=44, 69.8%), first day of OPD/Counselling Clerkship at the Hospital (n=27, 42.9%), and family and relationship (n=22, 34.9%). There were also first three effective activities or strategies employed to cope with stress as reported, which were napping or sleeping (n=59, 93.7%), spending time with family and friends (n=58,

92.1%), and exercising such as running and working out (n=39, 62.9%). Top two most agreed suggestions to alleviate stress were to improve and expand wireless internet, computer labs with sufficient computers and printers in pharmacy and library buildings (n=63, 96.8%) and to improve accommodation and transportation means in the University (n=58, 93.5%).

Discussion:

Socio demographic data showed that the post clerkship perceived stress level was highest in males, 22 years old, fifth group subjects, students who lived in rental house,

having no transportation, had average daily commute from residence to school for more than 4 times, and practiced regular exercise for about 11-20 minutes per day. However, none of these data were significantly difference among studied variable groups and automatically resembled that perceived stress did not depend on any said variables. This results was quite difference from a study by Leisa LM et al, which showed significant PSS score difference for male and female gender among the Doctor of Pharmacy Students, in which the male subjects showed higher perceived stress than female. Other variables showed not significantly differences in the said study.[2] The difference in the



results might be caused by the difference between level of education, as in this study the cohort were undergraduates, but in Leisa LM et al study, the cohort of PharmD students used. No published study on undergraduates to compare the perceived stress scale differences for the previous variables.

The perceived stress level for the first day of Outpatient/Counselling Clerkship (the pre level) was higher than the perceived stress level at the last day of clerkship (post clerkship). This fact meant that the students perceived stress level was lower at the end of the clerkship, although the result was not statistically significant. One of the reasons might be because of the students felt enjoyable during the clerkship activities. For examples, there were many hands-on activities as compared to written assignments in this clerkship. At the first and second day, students were attached to the outpatient department and experienced the process of screening and filling prescription under close supervision from preceptors.

The third day was the time for self-study, the fourth day meant for students' presentation on cases learned throughout the week, and finally the fifth day filled with 'mock counselling' and role play by the students. [18] There was a possibility that the perceived stress level was reduced at the last day of clerkship after a week of enjoyable activities.

In conjunction, this study also was meant to investigate the difference of perceived stress level before and after the clerkship, for different stress conditions. The subjects were significantly felt lesser 'angry because of things that happened that were outside of control' after the clerkship, as compared to before clerkship. This fact also contributed to lower perceived stress level after the end of clerkship. However, lower 'student's ability to deal successfully with day to day problems and annoyances' pre clerkship as compared to post clerkship showed that there were specific stress condition that was experienced by the students in more intensely post clerkship, despite lower overall perceived stress level.

In this study, the highest perceived common stress triggers as responded by the subjects were the academic stressors, which were 'assignments and assessment' and 'examination and stress.' This happened might be caused by the students were really committed to their academic performance and felt the pressure in producing the best academic result to ensure that they will excellently graduated. Environmental stressors, which was the 'first day clerkship at hospital' was also reported to be a stressor. This was because the students never experienced any fore coming activities or met with the pharmacists and other staffs in that Outpatient Department before hand. They might felt anxious and stressed to fulfil the requirement and expectations of the department's staffs. Interpersonal stressors as 'family and relationship' were also reported as stress triggers encountered by the students. The least stressor was the intrapersonal stressors, as 'financial concern.' Financial might be the least stressor as most of the students got a scholarship or academic loan throughout their 4 years of

learning period. Besides the reported stressors, a few students (n=7) reported the environmental stressor that was 'messy living condition' as the perceived stressors among them. [4] The condition might distract their learning focused and interfere with daily activities, thus lead to stress. Most of the above stressors were also supported by other studies' results among pharmacy students [2-5, 20]; medical and dental students [11, 15, 16]; nursing students [1, 21] and university and college students as a whole [22-24]. This showed that most of the college and university students experienced more or less the same of stressors, throughout the world. This in turn, needed the efforts of expertise to provide counselling on stress management towards specific stressors among college or university students.

Students' personal view on effective ways to cope with the stress were the most on 'napping/sleeping', followed by spending 'time with family and friends.' [2] A study by Heinrichs M et al revealed that the combination of oxytocin and social support exhibited the lowest cortisol concentrations and increased calmness and decreased anxiety during stress. [25] This showed the importance role of social support from family and friends in coping with stress. Moreover, 'exercising or working out' and 'watching television' also were strategies that personally viewed by the students as ways to overcome the stress condition. [2] A few student viewed that dancing (n=5), listening to music (n=3) and eating (n=1) were their personal opinion on strategies to cope stress.

A study by Berger et al among college students revealed that exercising mode that met four requirements involving aerobics, noncompetitiveness, predictability and repetitiveness may reduce stress. [26] Therefore, it was advisable for students to practice regular exercise, or even dancing as a measure to reduce their stress.

In the sense of suggestion for administrative changes in the clerkship, most of the suggestions went to 'improve and expand wireless internet, computer labs with sufficient computers and printers in pharmacy and library buildings. By improving the said means, the students will be able to search information in the form of e-journals, e-books, articles and etc in order to finish their assignments successfully. At the time, the wireless internet connection was a little bit low especially in the pharmacy building, and limits the students to search information, thus increase their stress level. Accommodation and transportation means also suggested to be improved, in order to provide more comfortable and conducive place to study and leisure, in hope to reduce stress-inducing conditions.

Limitation

The limitations in this study including low cohort used, which are only 67 students and the study was done in one practice site which was School of Pharmaceutical Sciences of Health Campus, instead of both Health Campus and Main Campus. Besides, the perceived stress level also measured at the first and last day of clerkship and not for everyday assessment. In addition, the perceived stress level was measured using PSS-14, and the instrument was not specific to pharmacy undergraduates. However, it was



selected to be used as the absence of specific perceived stress scale for pharmacy undergraduates. Other limitations were the participants were recruited through lecturers or preceptors and data were collected after 5 to 10 minutes of answering. The students might felt pressured to participate then.

Conclusion

Stress level decreased by 4.75% from the first day to the last day of clerkship, but not statistically significant. This might be due to the approach which focused more on hands-on activities than written assignments that may reduce the perceived stress level. Higher cohort samples and development of specific method of measuring perceived stress level in pharmacy undergraduates who are undergoing clerkships needed in future study. Possible stressors during clerkship needed further evaluation and strategies to cope stress needed appropriate implementation. Suggestions from students to alleviate stress need to be reviewed and considered, especially to improve internet connections and accommodations in the university, in order to reduce stress.

Acknowledgement

The authors would like to acknowledge the participation from Universiti Sains Malaysia final year students of Bachelor of Pharmacy programme. A very high appreciation also goes to Mr Syed Wasif and to Dr Norul Badriah Hassan and for the ideas and assistance throughout the process.

Declaration

A part of this study's data will be presented in the 6th Congress of the Asian Medical Education Association (AMEA 2011) on the 23rd- 26th March 2011

References

1. Beck DL, Hacket MB, Srivasta R, McKim E, Rockwell B. Perceived Level and Sources of Stress in University Professional schools. *J Nurs Educ.* 1997; 36: 180-6
2. Leisa LM, Amy A, Diane N, Shankar L. Perceived Stress and Quality of Life Among Doctor of Pharmacy Students, *Am J Pharm Educ.* 2008; 72: 137-6.
3. Patricia L. Canales-Gonzales, Peter L. Kranz, Perceived stress by students in a pharmacy curriculum, *Education*, Fall 2008, Website: http://findarticles.com/p/articles/mi_qa3673/is_1_129/ai_n28566113/. Date assessed: 18 December 2010.
4. Shannon ER, Bradley CN, Teresa MH, Sources of Stress among College Students, *College Student Journal*; June 1999. Website: http://findarticles.com/p/articles/mi_m0FCR/is_2_33/ai_62839434/ Date assessed: 18 December, 2010.
5. Gupchup GV, Borrego ME, Konduri N. The Impact of Student Life Stress on Health Related Quality of Life among Doctor of Pharmacy Students. *College Student J.* 2004;38:292-301.
6. Dulta Jan. Hirsch, Ai Hang Do, Kathryn A. Hollenbach, Anthony S. Manoguerra, David S. Adler. Students' Health-Related Quality of Life across the Preclinical Pharmacy Curriculum, *Am J Pharm Educ.* December 2009; 73: 147-8.
7. Hirsch Jan.D, Manoguerra, Anthony. and Adler, David. "Health Related Quality of Life in Pharmacy Students: Two Year Cohort Study (First Year Results)" Paper presented at the annual meeting of the American Association of Colleges of Pharmacy, Sheraton San Diego Hotel & Marina, San Diego, California, USA, Jul 05, 2006 <Not Available>. 2010-12-17 Website: http://www.allacademic.com/meta/p118937_index.html Date assessed: 18 December 2010.
8. Juntip Kanjanasilp, Kritsanee Saramunee, Suratchada Kongsree, Saithip Suthiraksa, Isara Chummalee, Rodchares Hanrinth. *Effects of Counseling for Stress and Depression in Pharmacy Students at Mahasarakham University, Isan J Pharm Sci.* 2009; 5:3
9. Stewart, Lam, Betson, Wong, Wong. A Prospective Analysis of Stress and Academic Performance in the First Two Years of Medical School. *Medical Education.* 1999; 33: 243-250.
10. Diane S. Kaplan, Ruth X. Liu, Howard B. Kaplan. School Related Stress in Early Adolescence and Academic Performance Three Years Later: The Conditional Influence of Self Expectations. *Soc Psychol Educ.* 2005; 8:1:3-17.
11. Robert J. Murphy, Sarah A. Gray, Gerald Sterling, Kathleen Reeves, Joseph DuCette, A Comparative Study of Professional Student Stress. *J Dent Educ.* 2009;73:3:328-337
12. AP, Pyles MA, Miederhoff PA, Stress in Health Professions Students: Myth or Reality? A Review of the Existing Literature. *J Natl Black Nurses Assoc.* July 2005; 16:1: 63-8.
13. Lai N, Nalliah S, Jutti RC, Hla Y, Lim VKE. The Educational Environment and Self-perceived Clinical Competence of Senior Medical Students in a Malaysian Medical School. *Educ Health* 2009;22:148-2.
14. Muhamad Saiful Bahri Yusoff, Ahmad Fuad Abdul Rahim, Mohd Jamil Yaacob, Prevalence and Sources of Stress among Universiti Sains Malaysia Medical Students, *Malaysian J Med Sci.* 2010; 17:1: 30-37
15. Muhamad Saiful Bahri Yusoff and Ahmad Fuad Abdul Rahim, Prevalence and Sources of Stress among Postgraduate Medical Trainees: Initial Findings, *ASEAN Journal of Psychiatry.* 2010;11:2:
16. Mohsin Shah, Shahid Hasan, Samina Malik, Chandrashekhar T Sreeramareddy. Perceived Stress, Sources and Severity of Stress among Medical Undergraduates in a Pakistani Medical School, *BMC Med Educ.* 2010; 10:2.
17. Samar A. Al-Saleh, Ebtissam M. Al-Madi, Nadia S. Al-Angari, Huda A. Al-Shehri, Mohammed Mohammed Shukri. Survey of Perceived Stress-inducing Problems among Dental Students, Saudi Arabia. *The Saudi Dental Journal.* 2010; 22:83-88.
18. Azmi Sariff, Siti Maisharah SG, Outpatient/Counselling Clerkship Module, Semester 1, 2010/2011, School of Pharmaceutical Sciences, Universiti Sains Malaysia.
19. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav.* 1983;24:385-96.
20. Anderson, K. M., Hevener, K. E. and Arreola, R. A. , 2006-07-05 "Stress Among Pharmacy Students: Sources and Impact" Paper presented at the annual meeting of the American Association of Colleges of Pharmacy, Sheraton San Diego Hotel & Marina, San Diego, California, USA <Not Available>. 2009-05-25 from http://www.allacademic.com/meta/p119214_index.html
21. Naiemeh Seyedfatemi, Maryam Tafreshi, Hamid Hagani. Experienced Stressors and Coping Strategies among Iranian Nursing Students, *BMC Nursing* 2007; 6:11
22. Dong Hun Lee , Sunwoo Kang , Sichang Yum. A Qualitative Assessment of Personal and Academic Stressors among Korean College Students: An Exploratory Study, *College Student J.* 2005;39,



- 23.** Beheshteh Abdi, Kianoush Mohammadi Roozbahani, Maryam Paeze. A Qualitative Assessment of Stressors among Iranian Applicants to the University: An Exploratory Study, *Procedia Social and Behavioral Sciences*.2010; 5:1171–1174.
- 24.** Shaher H Hamaideh, Stressors and Reactions to Stressors among University Students, *Int J Soc Psychiatry*.2011;57:1:69-80
- 25.** Heinrichs M, Baumgartner T, Kirschbaum C, Ehlert U. Social Support and Oxytocin Interact to Suppress Cortisol and Subjective Responses to Psychosocial Stress, *Biol Psychiatry*. 2003; 54:12:1389-98
- 26.** Berger, Bonnie G, Owen, David R, Stress Reduction and Mood Enhancement in Four Exercise Modes: Swimming, Body Conditioning, Hatha Yoga, and Fencing. *Research Quarterly for Exercise and Sport*.1988;59:2:148-59..

AUTHORS' CONTRIBUTIONS

Athors contributed equally to all aspects of the study.

PEER REVIEW

Not commissioned; externally peer reviewed

CONFLICTS OF INTEREST

The authors declare that they have no competing interests