

OUTPATIENT PHARMACY DEPARTMENT (OPD) AND COUNSELING CLERKSHIP AMONG FINAL YEAR PHARMACY UNDERGRADUATES: STUDENTS' EXPECTATION AND SATISFACTION

SITI MAISHARAH S.G, SABARIAH NOOR H, NUR HAFZAN M.H, GILLANI SW

Discipline of Clinical Pharmacy, School of Pharmaceutical Sciences, 11800, Universiti Sains Malaysia, Penang. Email: maisharah@usm.my

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ABSTRACT

Background: Experience-based learning is one of the important components in pharmacy undergraduate curriculum.

Aims: The objectives of the study were to determine student's expectation and satisfaction during Outpatient Pharmacy Department (OPD)/Counselling Clerkship.

Methods: 67 students assigned to OPD/Counselling Clerkship in a teaching hospital were given a set of questionnaire on the first day and last day to determine their expectation and satisfaction towards clerkship, respectively.

Results: Student's highest expectation was 'the clerkship will give them the description of their working life'. 87.3% of subjects also expected to 'participate in hands-on activities' instead of doing assignment. Satisfaction of the clerkship was most on the 'clarity of clerkship manual', followed by the 'extent to which preceptors treated them as mature individuals' and 'participation on hands on activities'.

Conclusion: The OPD/Counselling Clerkship was able to give an insight of suitable and proper experience-based learning in the field of pharmacy education.

Keywords: Undergraduate pharmacy student, Outpatient pharmacy/counselling clerkship, Expectation, Satisfaction.

INTRODUCTION

Outpatient Pharmacy Department (OPD) is one of the pharmacy departments that providing pharmaceutical care to the patients. The role of pharmacist in Outpatient Pharmacy Department (OPD) are mainly on prescription screening, drug filling and dispensing, medications counselling, and other managements works, such as stock management of medications.¹ Every job needs to be done in proper ways in order to ensure the best pharmaceutical care delivery to the patients.

The pharmacist's role in Outpatient Pharmacy Department is really crucial. Many studies on the impact of pharmacist's intervention in the department showed positive outcomes in term of pharmaceutical care delivery. In the sense of prescription screening, many studies have shown that a big number of problems associated with prescribing errors with the estimation of 2.6% until 15.4% of medications orders.²⁻⁹ There was also a study reported that approximately 4 per 100 dispensed prescriptions had problems and required pharmacists interventions including corrections in medications, strength or directions of medication use.⁷ Other separated study revealed prescription errors rate of 6.09 per 100 item and the most common errors related to absence of direction on how to take the medications.¹⁰

In the medication counselling context, there were a number of studies showed positive trend of improvement in the outcomes measured when it comes to the impact of pharmacist counselling as patient education in outpatient department and also in any other pharmacy settings.¹¹⁻¹⁶ A study by Naveen et al. for example, suggested the needs of pharmacist role in patient education in order to increase medication adherence.¹⁷

In conjunction to these importance of pharmacist's role, the Outpatient Pharmacy Department (OPD)&Counselling Clerkship was designated in order to produce well-informed and well-equipped future pharmacists with the required skills of pharmacists working in Outpatient Pharmacy Department; especially for the skill of patient counselling.^{18,26} However, until recently, there were very limited published studies on the evaluation of the specific clerkship in the undergraduates pharmacy students, especially in the view of student's expectations and satisfaction towards the clerkships. Few data available only in assessing the impact of Outpatient Department

Clerkship in medical students, which was difference in approach as compared to Outpatient Pharmacy Department Clerkship.²¹ The study of student's expectation and satisfaction in any learning style needs to be done, in order to determine how well and significance of the learning process among students. A study by Durak HI et al stated that students' feedback can be used to monitor the didactic quality of clerkships.²⁰ In a separated study, the finding showed a significant relationship between students' expectation with student motivation, persistence and learning.²⁰ These manifestations showed the importance to assessed students' expectation and satisfaction in order to provide a suitable approach in teaching and learning process.

Thus, this study was done with the rationales to: (1) determine the student's expectation towards Outpatient Pharmacy Department (OPD) /Counselling Clerkship; (2) measure the student's satisfaction level in many clerkship issues; (3) study the level of students' satisfaction towards clerkship according to gender, age, race, and clerkship group; and (4) explore possible relationship between level of satisfaction and perceived stress level.

In order to precisely understand the concept of Outpatient Pharmacy Department & Counselling Clerkship, this paper will describe in depth about the experienced-based teaching and learning program.

Program Description

Outpatient Pharmacy Department (OPD)/Counselling Clerkship is a part of experiential program designed for the undergraduate pharmacy students. It is designated to develop student's understanding regarding roles and functions of a pharmacist working in an outpatient pharmacy setting. The clerkship also meant to expose the students on appropriate skills in reading, interpreting, and screening of prescription, developing communication skills in providing effective drug information counselling to patients, as well as to develop professionalism in interacting and communicating with pharmacists and other health care providers. The main goal is to develop and enhance a student's understanding, problem-solving skills and knowledge of the appropriate use of medications.²²

Program Objectives

At the end of this clerkship, the student should be able to:²²

1. Assess and evaluate any prescription writing error (such as illegible prescription, incomplete prescription, etc) and prescription related problem (such as drug dosage errors, patient allergy, side effects of drugs, etc) during the prescription screening process.
2. Demonstrate skills in the process of prescription filling.
3. Apply appropriate pharmaceutical calculation in preparing extemporaneous preparations.
4. Demonstrate ability to handle psychotropic substance and dangerous drug (in term of documentation needed)
5. Demonstrate skills in providing effective drug information during counseling sessions in the counter and individual patient counseling, including special dosage forms and medical devices involved.

Program Format

This clerkship was conducted according to the specific format done by the lecturers. Every clerkship group which consists of 9-10 students will be attached to the Outpatient Pharmacy Department for five working days. Students will be evaluated on the assignments given pertaining to different activities, attendance, and also other individual student's personal activities. The activities involved were:²²

1. Handling of Prescriptions.

In this activity, the students involved in prescription screening for any prescription-related problems; prescriptions filling (including the calculation for extemporaneous preparations, recording of Dangerous Drugs and Psychotropic Substances); and learning on techniques to be used when dispensing the medications.

2. Medication Counselling

This activity will require the students to learn on counselling technique by listening to actual pharmacist-patient counselling sessions.

3. Medication Write-up

Students should expand their medication knowledge by reviewing medications that were prescribed to the patient and complete a medication write-up sheet.

4. Counselling and Role Play

This session requires the students' participation in the activities with the lecturer. Apart from counselling in the OPD, students will be asked to perform a 'mock counselling' in the PPSF Meeting Room. This session will not only required the student to apply the counselling techniques, but also allow hands on activities to the students, which will involve the technique of handling common medical devices used (such as MDI, insulin pens, etc) and special dosage form of medications (eye drop, ointment, etc). Besides, in this session, students will be given a scenario based on chosen actual prescription and will be evaluated based on ability to apply all of the skills of prescription handling as well as counselling based on their experience in the Outpatient Pharmacy Department.

4. Presentation

Students will need to present the cases, which are from the prescriptions given. The presentation will include all components of prescription handling and also counselling points needed.

Self study

This session will give the student opportunity to search for evidence-based information in completing the assignments, preparing the presentations and also for self-continuous education.

METHODOLOGY

This was a prospective cross sectional survey by using universal sampling technique. 67 final year students of Bachelor of Science Pharmacy were invited to participate in this study. The students were all of those who underwent one semester of Outpatient Pharmacy Department (OPD) & Counselling Clerkship in a teaching

hospital from 29/8/2010 until 28/10/2010. All students were given a consent form for each person in order to fulfill the ethical requirement.

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 Pharmacy Department (OPD) & Counselling Clerkship for different weeks. They were given a set of questionnaire at the first day prior to the clerkship briefing and a different set of questionnaire at the last day of clerkship just after finishing the last activity for that last day. The subjects were given 5-10 minutes to fill in the questionnaire before been collected by the researcher. The first set of questionnaire (Questionnaire 1) built up of 2 parts, which are Part A and Part B. Part A contained 12 questions on required demographic data of the subjects, whereas Part B consists of 7 closed-ended questions on issues related to students' expectation of the clerkship. This Questionnaire 1 given at the first day of clerkship. On the last day of clerkship, subjects were given Questionnaire 2 containing Part C, Part D and Part E. Part C was about the demographic data, Part D meant for measuring the perceived stress level, which listed with 14 questions of established validity and reliability Perceived Stress Scale (PSS-14) with 5-point Likert Scale ranking for the answers with the permission of the original authors. 7 questions that related to negative responses were scored in reverse manners.²³ Total score ranges from 0-56, in the sense of higher perceived stress level indicated by higher total PSS score. The last part, which was Part E summarized of 14 questions to resemble the satisfaction level in matters regarding the clerkship. The satisfaction level was built by 5-point Likert Scale ranking for the answers. The total score ranges from 0-52, which higher satisfaction level indicated by higher Total Satisfaction Score. Face and content validation was done by pharmacy lecturers and pharmacists.

The data then entered into SPSS 18.0 and analyzed using a number of statistical analyses. Descriptive analysis used to determine the frequency of every demographic data variable, total score of individual PSS score post clerkship, each PSS questions, students' expectation and satisfaction level. Variation in individual mean satisfaction level according to the gender measured for the differential significance by using student t-test. Mean satisfaction level differences according to age, race, and clerkship group were tested using one way Anova test for the significance. In addition, correlation and regression test used to examine the relationship between satisfaction and stress level.

RESULTS

All 67 students responded to the questionnaire, which produced the response rate of 100%. Table 1 summarized the socio-demographic data of the subject, Table 2 meant for the descriptive analysis of the students' expectation of the clerkship. Table 3 was a collection of students' satisfaction regarding matters related to the clerkship. Figure 1 reported the correlation between students' perceived stress level and satisfaction level.

None of the independent variables, which were gender, age, race, and clerkship groups, possessed a significant difference in term of satisfaction level. This showed that satisfaction level was not associated with the difference of any said independent variables.

Regarding the students' expectation towards issues regarding clerkship, most of the students strongly agreed and agreed that they will 'get clear description about their working life as a future pharmacist' (n=56, 88.9%). A high number of subjects (n=55, 87.3%) also expected to 'participate in hands-on activities' instead of doing assignment.

Students' satisfaction was the highest regarding the clarity of clerkship documentation or manual with the mean score of 2.98 (SD 0.523). This followed by 'the extent to which preceptors treated them as mature individuals' (mean 2.97, SD 0.567); 'hands on activities' (mean 2.95, SD 0.521); 'extent to which preceptors were approachable and available' (mean 2.95, SD 0.705); 'assignments given' (mean 2.94, SD 0.471); 'opportunities for discussion with

preceptors' (mean 2.92, SD 0.655); and 'extend to which preceptors were sympathetic and supportive to the needs of students' (mean 2.92, SD 0.576) and etc, as what stated in Table 3. The stress level

was examined and measured by using 14 item-Perceived Stress Scale by Cohen et.al, and the Cronbach α obtained in this research sample was 0.873.

Table 1: Sociodemographic data and mean satisfaction level

Variable	No (%) (N=67)	MEAN Satisfaction (SD)	Significance
Gender			*NS
Male	15 (22.4)	37.40 (5.34)	
Female	52 (77.6)	37.83 (6.32)	
Age			*NS
21	7 (10.4)	36.67 (2.42)	
22	43 (64.2)	37.89 (5.56)	
23	16 (23.9)	37.12 (6.32)	
24	1 (1.5)	32.00	
Race			*NS
Malay	15 (22.4)	36.00 (5.27)	
Chinese	51 (76.1)	37.85 (5.58)	
Eurasian	1 (1.5)	41.00	
Clerkship group			*NS
First group	9 (13.4)	41.33 (3.00)	
Second group	9 (13.4)	35.67 (4.30)	
Third group	10 (14.9)	36.80 (4.76)	
Fourth group	10 (14.9)	35.00 (6.27)	
Fifth group	10 (14.9)	37.15 (7.56)	
Sixth group	10 (14.9)	38.25 (2.97)	
Seventh group	9 (13.4)	38.56 (7.21)	
Residence			*NS
Nurani	13 (19.4)	37.00 (6.14)	
Ten Ten	50 (76.1)	37.31 (5.44)	
3 (4.5)	Rental House	42.00 (2.00)	
Average Daily Commute from Residence to School			*NS
1-2 Times	48 (71.6)	37.00 (6.14)	
3-4 times	14 (20.9)	37.31 (5.44)	
>4 times	5 (7.5)	42.00 (2.00)	
Availability of Transportation			*NS
Yes	7 (10.4)	38.43 (5.25)	
No	60 (89.6)	37.36 (5.56)	
Presence of Self Health Problem			*NS
Yes	4 (6.0)	35.00 (2.94)	
No	63 (94.0)	37.66 (5.61)	
Presence of Family Health Problem			*NS
Yes	35 (52.2)	37.56 (6.34)	
No	32 (47.8)	37.40 (4.54)	
Smoking Cigarettes			*NS
Yes	0 (0.0)	-	
No	67 (100.0)	37.48 (5.50)	
Regular Exercise per Day within Last Week			*NS
No	50 (74.6)	36.38 (5.27)	
1-10 minutes per day	3 (4.5)	44.67 (2.08)	
11-20 minutes per day	6 (9.0)	39.60 (2.61)	
21-30 minutes per day	5 (7.5)	41.40 (6.88)	
31-40 minutes per day	3 (4.5)	39.00	

Table 2: Student's expectation of clerkship (Cronbach α = 0.711)

S. No.	Questions	Strongly agree No (Valid%)	Agree No (Valid%)	Neutral No (Valid%)	Disagree No (Valid%)	Strongly disagree No (Valid%)
1	Participate in hands-on activities instead of doing assignment	19 (30.2)	36 (57.1)	8 (12.7)	0 (0.0)	0 (0.0)
2	Clerkship means more leisure time for yourself	2 (3.2)	11 (17.6)	27 (42.9)	0 (0.0)	0 (0.0)
3	Clerkship is like visiting practice site instead of experiential learning	2 (3.2)	5 (7.9)	24 (38.1)	31 (49.2)	1 (1.6)
4	This clerkship is not as important as lectures	2 (3.2)	0 (0.0)	9 (14.5)	41 (66.1)	10 (16.1)
5	In this clerkship you will be able to apply all the theory that has been taught in lecture	4 (6.3)	32 (50.8)	23 (36.5)	3 (4.8)	1 (1.6)
6	The clerkship will give you description on your working life	15 (23.8)	41 (65.1)	7 (11.1)	0 (0.0)	0 (0.0)
7	The clerkship is just to fulfil the coursework components in your final marks	0 (0.0)	3 (4.5)	25 (39.7)	29 (46.0)	6 (9.5)

During the coming week in clerkship, do you expect the following?

Table 3: Student's satisfaction towards clerkship (Cronbach α = 0.909)

S. No.	Questions	Strongly satisfy No (valid%)	Satisfy No (Valid %)	Neutral No (Valid%)	Do not satisfy No (Valid%)	Strongly do not satisfy No (Valid%)	Overall Response Mean (SD) No (Valid%)
1.	Are you satisfied with hands-on activities in this clerkship?	7 (11.1)	46 (73.0)	10 (15.9)	0 (0.0)	0 (0.0)	2.95 (0.521)
2.	Are you satisfied with clarity of clerkship documentation? (Clerkship manual)	8 (12.7)	46 (73.0)	9 (14.3)	0 (0.0)	0 (0.0)	2.98 (0.523)
3.	Are you satisfied with the way your timetable is spread over the week?	8 (12.7)	33 (52.4)	20 (31.7)	2 (3.2)	0 (0.0)	2.75 (0.718)
4.	Are you satisfied with the assignment given to you?	5 (7.9)	49 (77.8)	9 (14.3)	0 (0.0)	0 (0.0)	2.94 (0.471)
5.	Are you satisfied with clarity of information about your assessment criteria (reports, presentation, attendance, attitudes)?	5 (7.9)	46 (73.0)	11 (17.5)	1 (1.6)	0 (0.0)	2.87 (0.553)
6.	Are you satisfied with the room provided for discussion?	4 (6.3)	37 (58.7)	15 (23.8)	6 (9.5)	1 (1.6)	2.59 (0.816)
7.	Are you satisfied with the spaces provided for hands-on activities?	4 (6.3)	43 (68.3)	13 (20.6)	3 (4.8)	0 (0.0)	2.76 (0.640)
8.	Are you satisfied with the facilities for hands-on activities?	5 (8.1)	43 (69.4)	13 (21.0)	1 (1.6)	0 (0.0)	2.84 (0.578)
9.	Are you satisfied with the opportunities for discussion with preceptors?	9 (14.3)	42 (66.7)	10 (15.9)	2 (3.2)	0 (0.0)	2.92 (0.655)
10.	Are you satisfied with the extent to which preceptors are sympathetic & supportive to the needs of students?	7 (11.1)	45 (71.4)	10 (15.9)	1 (1.6)	0 (0.0)	2.92 (0.576)
11.	Are you satisfied with the extent to which preceptors treat student as mature individuals?	8 (12.7)	46 (73.0)	8 (12.7)	1 (1.6)	0 (0.0)	2.97 (0.567)
12.	Are you satisfied with the extent to which preceptors are approachable and available?	12 (19.0)	38 (60.3)	11 (17.5)	2 (3.2)	0 (0.0)	2.95 (0.705)
13.	How do you rate your Outpatient/Counselling Clerkship?	8 (12.7)	48 (76.2)	7 (11.1)	0 (0.0)	0 (0.0)	3.02 (0.492)

Satisfaction Scale ranges from: strongly dissatisfy (0) to strongly satisfy (4)

Total PSS score mean was measured and the detected mean value was 27.70 (SD 6.86). The full report on the perceived stress level results has been reported in the previous paperwork published.²⁴ The investigators also examined the possible correlation between

perceived stress level (measured by PSS-14) and satisfaction level of the students. There was a significant negative correlation between PSS and satisfaction level ($p < 0.05$, Spearman's Rank Correlation Test= -0.265).

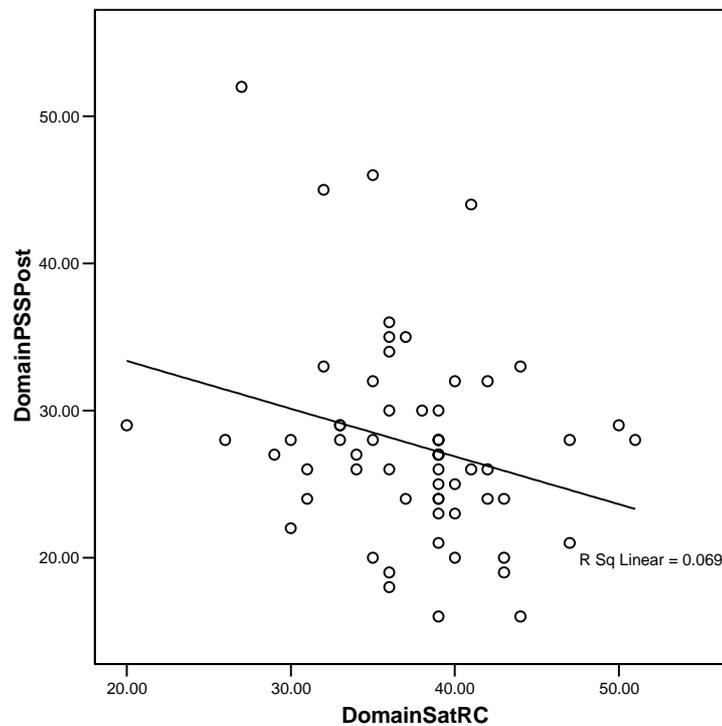


Fig. 1: Relationship between PSS Score and satisfaction level

($p < 0.05$, Spearman's Rank Correlation Test= -0.265)

DISCUSSION

Level of satisfaction towards Outpatient Pharmacy Department (OPD)&Counselling Clerkship was the highest in female, 22 years old, Chinese, among the first group members, resided in Ten-Ten (hostel dorm), had average daily commute from residence to school for more than 4 times per day and had the availability of transportation. Students without own health problem but with family health problem; as well as practiced 1 to 10 minutes of daily exercise also showed the highest satisfaction level. However, none of these figures were supported by statistical significant data. In other word, the level of satisfaction did not associate with the differences in gender, race, age, clerkship groups, and any other variables studied.

According to the student's expectation reported, the highest number of students expected that OPD&Counselling Clerkship will give them 'a clear description about their working life as a future OPD Pharmacist'. This tailored to the main objective of other clerkships, in order to inspire students to be better professionals, practitioners, and educators in whatever career path that they choose.²⁵ These expectations hoped to be met by involving in all the activities in the clerkship that specifically focused on role of pharmacist in outpatient department unit. Besides, the students' expectation was also 'more on hands-on activity participation instead of doing assignments'. A study on pharmacy clinical clerkship in the educational years reported the feedback from students that indicated more exposure to hands-on in patient care would be valuable.²⁶⁻²⁸ This manifested the importance of hands-on activity as what expected by the students. Besides, high level of students' expectation focused on the ability to 'apply all the theory that has been taught in lecture' in the clerkships. The students also aware that the clerkship was not meant for 'more leisure time', was 'as important as lectures', 'not just to fulfilled the course work components in the final marks', and 'was an experiential learning practice site instead of visiting site'. All the expectations showed that the students were in the right track in expecting the important components of the clerkship.

The most satisfied components in the clerkship as reported were the 'clarity of the clerkship documentation or manual', which contained all the activities with time table, assessment criteria, expectations from the preceptors or lecturers, all the rules and regulations that needed to be followed, and references. This documentation clarity will aid the students in understanding and meeting all the expectations needed in the clerkship. Besides, hands-on activities provided also included in the students' satisfaction at a high level. In the activity, they were able to experience themselves, in the way of conducting a counselling as well as the handling technique of the important medical devices. Hands on learning was many times being reported to be able to trigger students creativity, attitude, perception, imagination and desire for these students to learn further on, as compared to traditional textbooks teaching.^{29,30} Other important aspect in the clerkship which was the 'assignment given' also possessed a high satisfaction value among students. Assignments needed as one of the method to evaluate the students and at the same time act as a medium for practising their knowledge regarding each task. A study revealed that students perceived that assignments can improve their general academic development and preparation of future job.³¹

Preceptors' involvement in the OPD& Counselling clerkship not to be excluded as the element that ranked ten highest satisfaction levels among the students. High level of students' satisfactions went to 'extent to which preceptors treated them as mature individuals'; 'extent to which preceptors are approachable and available'; 'extend to which preceptors were sympathetic and supportive to the needs of students'; and 'opportunities for discussion with preceptors.' Dedicated, supportive and competent preceptors were very important in order to ensure effective communication and effective teaching and learning process during the clerkship. These positive attitudes of preceptors in guiding the students through the clerkship were often reported to be a factor of students' satisfaction.^{20,32}

This study also revealed the fact that level of students perceived stress was negatively correlated with level of satisfaction towards

the clerkship; significantly. This showed that the lower the perceived stress value, the higher satisfaction value among students. This result was parallel to many studies, which documented that the level of satisfaction among student was negatively correlated with the level of perceived stress.^{33,34} Automatically, it also meant that the student had a low perceived stress level during this clerkship as they had a high rate of satisfaction throughout the process, which in turn showed that this clerkship program was suitable for teaching and learning purposes.

CONCLUSION

Approach that had been done in the Outpatient Pharmacy Department/ Counselling Clerkship for the undergraduates produced a positive outcome and feedback from the students. Almost all of the students' expectations were fulfilled during the clerkship, especially in the context of providing them the clear pictures of their future working environment as an Outpatient Department Pharmacist and activities that supposed to be done during the clerkship, including hands on activities and etc. In term of satisfaction, students were satisfied the most on issues related to the clarity of clerkship documentation, number of assignments given, as well as the participation of preceptors as a guidance to their learning. Students also showed a high number of total levels of satisfaction as they showed a low level of total perceived stress during the clerkship. Therefore, this approach could be continued and implemented in the future clerkship as a method of teaching and learning.

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REFERENCES

1. Official Website of Pharmaceutical Services, Ministry of Health, Malaysia, Website: <http://www.pharmacy.gov.my/index.cfm?&menuid=110&parentid=107>, Date Accessed: 25th September 2012.
2. Chua SS, Kuan MN, Ramli MN. Outpatient prescription intervention activities by pharmacists in a teaching hospital, Malaysian Journal of Pharmacy. 2003;1(3):86-90
3. Rupp MT, Schondelmeyer SW, Wilson GT, Krause JE. Documenting prescribing errors and pharmacist interventions in community pharmacy practice. Am Pharm. 1988; NS28: 30-37.
4. Ellis BC, Dovey SM, Collins DM, Tilyard MW, Clark DWJ. General practitioners' views on the role of the community pharmacist. N Z Med J. 1992; 105: 403-405.
5. Rupp MT. Screening for prescribing errors. Am Pharm. 1991; NS31: 71-78.
6. Bates DW, Boyle DL, Vander Vliet MB, Schneider J, Leape LL. Relationship between medication errors and adverse drug events. J Gen Intern Med. 1995; 10: 199-205.
7. Christensen DB, Campbell WH, Madsen S, Hartzema AG, Nudelman PM. Documenting outpatient problem intervention activities of pharmacists in an HMO. Med Care. 1981; 19: 105-117.
8. Folli HL, Poole RL, Benitz WE, Russo JC. Medication error prevention by clinical pharmacists in two children's hospital. Pediatrics. 1987; 79: 718-722.
9. Hawkey CJ, Hodgson S, Norman A, Daneshmend TK, Garner ST. Effect of reactive pharmacy intervention on quality of hospital prescribing. BMJ. 1990; 300: 986-990.
10. Marwaha M, Marwaha RK, Wdhwa J, Padi SSV. A retrospective analysis on a survey of handwritten prescription errors in general practice. International Journal of Pharmacy and Pharmaceutical Sciences. 2010; 2(suppl 3): 80-82.
11. McCombs JS, Cody M, Besinque K, Borok G, Ershoff D, Groshen S, Hay J, Johnson KA, Nichol MB, Nye MT. Measuring the impact of patient counseling in the outpatient pharmacy setting: the research design of the Kaiser Permanente/USC patient consultation study. Clin Ther. 1995; 17(6):1186-1206.

12. Hargraves TL, Bennett AA, Brien JE. Evaluating outpatient pharmacy services: a literature review of specialist heart failure services. *Int J of Pharm Prac.* 2006, 14: 3-9
13. Morrison A, Wertheimer AI. Evaluation of studies investigating the effectiveness of pharmacists' clinical services. *Am J Health-Syst Pharm.* 2001;569-577
14. Cantwell-Mcnelis K, James CW. Role of clinical pharmacists in outpatient HIV clinics. *Am J Health-Syst Pharm.* 2002;59(5):447-452
15. Paulós CP, Nygren CE, Celedón C, Cárcamo CA. Impact of a pharmaceutical care program in a community pharmacy on patients with dyslipidemia. *Ann Pharmacother.* 2005; 39(5): 939-943
16. Viktil KK, Blix HS. The impact of clinical pharmacists on drug-related problems and clinical outcomes. *Basic & Clinical Pharmacology & Toxicology.* 2008; 102: 275-280.
17. Santhosh YI, Naveen MR. Medication adherence behaviour in chronic diseases like asthma and diabetes mellitus. *International Journal of Pharmacy and Pharmaceutical Sciences.* 2011; 3(4):41-43
18. Clinic Outpatient Pharmacy Clerkship - Rochester, Minnesota, Mayo School of Health Sciences, College of Medicine, Copyright 2010 Mayo Foundation for Medical Education and Research. Website: <http://www.mayo.edu/mshs/pharm-copc-rch.html>. Date accessed: 10th July 2012
19. Eagle PF, Marcos LR. Impact of the outpatient clerkship on medical students. *Am J Psychiatry.* 1980;137(12):1599-1602.
20. Durak HI, Vatansver K, van Dalen J, Van der Vleuten C. Factors determining students' global satisfaction with clerkships: an analysis of a two year students' ratings database. *Adv in Health Sci Educ.* 2008 13:495-502.
21. Kihara M, Matsuo O, Kamisako T, Fukuda K, Ashida T, Takemura T, Iwamoto I, Miyazaki T, Hashimoto N. Effect of clinical clerkship on students' attitudes toward medical learning in Japan: a case study at Kinki University School of Medicine. *Pathophysiology.* 2003; 9(2): 111-113.
22. Azmi S, Siti Maisharah SG. Outpatient/Counselling Clerkship Module, Semester 1 2010/2011. School of Pharmaceutical Sciences, Universiti Sains Malaysia. (unpublished)
23. Cohen S, Kamarck T, Mermelstein R. A global measure of perceived stress. *J Health Soc Behav.* 1983;24:385-396.
24. 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. *IJPTP.* 2011; 2(1):39-45.
25. Hammer, Dana P, Paulsen, Susan M. An innovative clerkship in pharmacy education, *American Journal of Pharmaceutical Education.* 2001; 65: 284-293
26. Vrahnos D, Maddux MS. Introductory clinical clerkship during the first and second professional years: emphasis in clinical practice and writing. *American Journal of Pharmaceutical Education.* 1998; 62: 53-61.
27. Bucci, K.K., Maddox, R.W., Homes, T.J., Broadhead, W.E. and Tse, C.J., Implementation and evaluation of a shadow program for PharmD students. *American Journal of Pharmaceutical Education.* 1993; 57: 44-49.
28. Erstad BL, Armstrong EP, Callahan P, Keller, J. Evaluation of practice learning experience for entry-level Doctor of Pharmacy students. *American Journal of Pharmaceutical Education.* 1997;61: 87-90.
29. Cabral L. Twenty-first century skills for students: Hands-on learning after school builds school and life success. *New Directions for Youth Development.* 2006;110:155-161
30. Bredderman, T. What research says: Activity science - the evidence shows it matters. *Science and Children,* 1982: 20(1), 39-41.
31. Beachboard MR, Beachboard JC. Critical- thinking pedagogy and student perceptions of university contributions to their academic development. *The International Journal of an Emerging Transdiscipline.* 2010;3:53-71
32. Guarino CM, Ko CY, Baker LC, Klein DJ, Quiter ES, Escarce JJ. Impact of instructional practices on student satisfaction with attendings' teaching in the inpatient component of internal medicine clerkships. *J Gen Intern Med.* 2006; 21:7-12.
33. Coffman DL, Gilligan TD. Social support, stress, and self-efficacy: effects on students' satisfaction. *Journal of College Student Retention.* 2002; 4(1):53-66.
34. Cotton SJ, Dollard MF, de Jonge J. Stress and student job design: satisfaction, well-being, and performance in university students. *International Journal of Stress Management.* 2002; 9(3):147-162.