

## Assessment of Clinical Pharmacy Services and its Challenges at Jimma University Medical Center, Ethiopia

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**Abstract:** *Background:* Clinical pharmacy practice has developed internationally to expand the role of a pharmacist well beyond the traditional roles of compounding and supplying drugs to roles more directly in caring for patients by providing pharmaceutical care. To achieve this, clinical pharmacists are trained and provide comprehensive drug management to patients, but there are challenges on its implications. *Objective:* To assess the clinical pharmacy services and its challenges at Jimma University Medical Center. *Methods:* Prospective cross-sectional study was employed and the data were collected by using pre-tested, self-administered structured questionnaires which have socio-demographic variables, questions to evaluate the clinical pharmacy services at Jimma University Medical Center. The questionnaire was disseminated for respondents by the principal investigator and collect after a week. The data were analyzed by using SPSS window version 21.0 statistical software. *Results:* A total of 165 graduating class pharmacy students and post graduate clinical pharmacist were included in the study. From the total of study participants, 30 (18.2%) of them were post graduate clinical pharmacy students and 135 (81.8%) were undergraduate graduating pharmacy students. Among them 48 (29.1%) were female and 117 (70.9%) were males. The mean age of students was  $25.47 \pm 0.877$ . Based on the Lickert scale analysis, results showed that almost all of the study participants concluded the existence of very poor attitude on clinical pharmacy services and its education. *Conclusions:* The recent shift of pharmacy education towards clinical pharmacy practice in Ethiopia face challenges in the implementation of clinical pharmacy service. Although the perception of students regarding the curriculum change indicates that curriculum was not designed taking the countries current pharmacist needs because there was no integration of clinical pharmacy services in the health care system.

**Key words:** Clinical Pharmacy • Clinical Pharmacy Services • Challenges • JUMC

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### INTRODUCTION

The American College of Clinical Pharmacy most recently defined Clinical pharmacy as “the health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, wellness and disease prevention”. Succinctly put, it is “the area of pharmacy concerned with the science and practice of rational medication use”. The practice of Clinical Pharmacy embraces the philosophy of pharmaceutical care; it blends a caring orientation with specialized therapeutic knowledge, experience and judgment for the purpose of ensuring optimal patient outcomes. As a discipline, Clinical Pharmacy also has the obligation to contribute to the generation of new knowledge that advances health and quality of life [1].

Clinical pharmacists are uniquely trained in therapeutics and provide comprehensive drug management to patients and providers (includes physicians and additional members of the care team). Pharmacist intervention outcomes include economics, health-related quality of life, patient satisfaction, medication appropriateness, adverse drug events (ADEs) and adverse drug reactions (ADRs). An ADE is defined as “an injury resulting from medical intervention related to a drug, ” and an ADR is defined as “an effect that is noxious and unintended and which occurs at doses used in man for prophylaxis, diagnosis, or therapy” [2].

Pharmacists focused on dispensing and compounding till 20<sup>th</sup> century, but now, pharmacy profession has undergone a significant paradigm shift with movement away from a traditional distributive role

toward a clinical and patient oriented practice, which has intensified the focus on teamwork and the importance of inter professional relationships [3]. Due to the public's growing awareness of the complexities of the healthcare delivery system, rapid developments in technology, constantly increasing health related issues and cost of the therapy changed the roles and functions of pharmacists [4].

Clinical pharmacy practice was developed in the United States and most European countries and is now available in many parts of the world including Brazil, Chile, Spain and Australia. Developing countries like Pakistan, India and Bangladesh and many African countries and parts of the Middle East are changing their entry-level qualification to a Pharm. D with an emphasis on developing clinical pharmacy practice [5]. However, traditionally, Ethiopia carries a track record of product-oriented pharmacy practice. Recently, there is a shift in trend towards patient-focused practice after a 5-year Bachelor of Pharmacy (B. Pharm) with a 1-year clerkship program was developed. Moreover, in 2009, the School of Pharmacy of Jimma University took the initiative of launching a postgraduate clinical pharmacy program and became the pioneer in strengthening the undergraduate patient-oriented pharmacy program in Ethiopia. Clinical pharmacists have just begun working alongside physicians in the Jimma University Medical Center (JUMC). They participated in multidisciplinary teams and in ward rounds in inpatient settings to give pharmaceutical-care services according to the standards of practice [6].

Clinical Pharmacy Services (CPS) can be defined as professional services provided by pharmacists, who use their skills and knowledge to take an active role in patient health, through effective interaction with both patients and other healthcare professionals. In these services, pharmacists have started to develop an important role in patient care process, reducing medication errors, reducing costs of drug therapy and improving patient health conditions [7].

Pharmaceutical care has paid high value starting from our country's health policy to stalk holders (hospitals, schools, other governmental and non-governmental institutions). The importance of pharmaceutical care services in saving lives and protecting public health is particularly relevant in resource-limited settings with a high prevalence of major medicine-treatable diseases and systems wide opportunities related to pharmaceutical care. Pharmaceutical care providers participate in ward rounds. Their clinical knowledge and skill has been

improved and they have also trying to do more clinical based researches (complex case reports, drug therapy problem identification and intervention. Thus 'Clinical Pharmacists' is the heart of pharmaceutical care. The importance of pharmaceutical care services in saving lives and protecting public health is particularly relevant in resource-limited settings with a high prevalence of major medicine-treatable diseases and systems wide opportunities related to pharmaceutical care. Areas where the pharmaceutical care approach might be applied to sub-Saharan Africa include medicine use evaluation, medication adherence and Pharmaco-vigilance [8].

**Statement of the Problem:** Clinical pharmacy services faces different challenges on its implementation such as resistance of other health care professionals, unable to uphold responsibilities in their job, unable to get benefits for their activity, inadequate clinical skills, almost no role and responsibility of clinical pharmacist (lecturers) in their university hospitals, curriculum related problem and lack of sufficient number of specialists pose challenge for the emerging role of pharmacists [9].

Clinical Pharmacy needs no further introduction to pharmacists as it is the heart of pharmaceutical care. It has significantly peripheral specialized pharmacy knowledge that is equally vital to optimize the quality of health care. It is a global issue in the pharmacy world. It is important first to accept the fact that the task in facing the challenges is the responsibility of the individual professionals forming the profession. For many reasons, regarding to the responsibility entirely to the pharmacy professionals, Ministry of Health or the individuals holding certain posts and positions in the managerial level - an irresponsible dogma that should be eliminated as it brings more harm than good to us all [10].

The transformation of pharmacy profession towards increased patient care orientation is definitely one of the new experiences being faced in developing countries. As for challenges to acceptance of a global competency framework, the barriers identified included economic, educational and linguistic; highlighting variability in pharmaceutical service provision and functional challenges such as how one framework with applicability to different settings could be developed. The governmental policy and implementation of clinical pharmacy practice need to acceptance in hospitals. The need to develop continuing professional development programs to ensure that the current pharmacy workforce is "fit for purpose and try to overcome major challenges of professionals [11].

Patients admitted to hospital are at high risk for experiencing medication errors and there is a high potential to improve their drug therapy. By reducing medication history errors and improving medication appropriateness, clinical pharmacy services within a multi professional healthcare team improved the quality and safety of patient's drug therapy. The effect of routine implementation of medication reconciliation and review on healthcare visits will need further evaluation [12].

**Significance of the Study:** Competent and skilled clinical pharmacists are the corner stone of the health care in reducing patient mortality, morbidity and overall health care cost. This study was provided information on challenges encountered in clinical pharmacy services and on its challenges in clinical interventions. It also provides information about associated factors for the challenges on clinical services. This study was the first study to be done on clinical pharmacy services and its challenges at Jimma University Medical Center. Therefore, it will serve to devise intervention mechanism based on the significance of the problem, help new Universities which have intension to open clinical pharmacy training and for hospitals they want involves clinical pharmacist to provide pharmaceutical care for their patients. It is important for the future and as a base line research for other studies which were done on clinical pharmacy services and its challenges in clinical services.

Therefore, the general objective of this study was to assess the clinical pharmacy services and its challenges at Jimma University, Medical Center. And the specific objectives are: to determine the attitude of graduating pharmacy students and post graduate clinical pharmacy students on clinical pharmacy services at JUMC; to identify the challenges of clinical pharmacy services at JUMC; and to assess the importance of clinical pharmacists in clinical services at JUMC.

## MATERIALS AND METHODS

**Study Area and Period:** The study was conducted at JUMC. Jimma University is one of the most prominent and prestigious universities in Ethiopia, which is located 354 km away from Addis Ababa. The University has educated a number of individuals who have contributed to the improvement and development of the country. It was established in 1952 based on the need for modernizing Ethiopian agriculture in particular and education in general through the establishment of an agricultural college and training. In the past few years the university

has witnessed tremendous expansion in terms of fields of study and facilities. As one of the first and oldest institutions of higher learning in Ethiopia, strives to be among the leading universities recognized nationally and internationally for excellence in learning, teaching and research and community engagement.

JUMC is the major health service providing governmental institute in the Jimma town which is found at a distance of 354 kilometers from Addis Ababa. JUMC is the only Medical Center in southwestern Ethiopia and gives different health service for more than five million populations. JUMC is one of the oldest teaching public hospitals in Ethiopia which provides service in surgery, gynecology obstetrics, general internal medicine, pediatrics and child health, OPD major operation rooms and diagnostic facilities.

**Study Design:** A prospective cross-sectional study was employed.

### Population

**Source Population:** All pharmacy students and clinical pharmacy post graduate students.

**Study Population:** All graduating undergraduate pharmacy students and post graduate clinical pharmacy students.

### Inclusion and Exclusion Criteria

**Inclusion Criteria:** The study included the graduating class of 5<sup>th</sup> year regular pharmacy students and 6<sup>th</sup> year evening students. Also, post graduate clinical pharmacy students both year 1 and 2 were included.

**Exclusion Criteria:** Students below 5<sup>th</sup> year were of undergraduate students. Students were not volunteers to participate in the study.

### Sample Size and Sampling Technique

**Sample Size:** All study populations were included in the study.

**Sampling Technique:** Convenience sampling technique was employed to conduct this study.

### Data Collection and Measurement

#### Variables

**Independent Variables:** Age, sex, educational level; Work load; Total credits hours taken; Engagement in clinical training; Receiving comment from clinical pharmacists/students; Role model clinical pharmacists.

**Dependent Variables:** The study variables included each attitude of students on clinical pharmacy; the clinical pharmacy challenges; and the clinical pharmacy services.

**Data Collection Instrument:** The data were collected using pre-tested, self-administered structured questionnaires which have socio-demographic variables, work load, total credit hours taken, engagement on clinical training, presences of advisor, receiving comment from clinical pharmacists and role model clinical pharmacist. It is also contain questions on the different challenges and its clinical impacts on clinical services. The questionnaire was prepared in English.

**Data Collection Process:** The questionnaire was disseminated for respondents by the principal investigator and it was collected after a week.

#### **Operational Definition**

**Clinical Pharmacy:** Is a health science discipline where pharmacists provide patient care that optimizes medication therapy and promotes health, wellness and disease prevention.

**Adverse Drug Event:** Is an injury resulting from medical intervention related to a drug.

**Adverse Drug Reaction:** Is an effect that is noxious and unintended and which occurs at doses used in man for prophylaxis, diagnosis, or therapy.

**Student:** A person who study clinical pharmacy for B. Pharm award at Jimma University, school of pharmacy.

**Post Graduate Student:** A person who studies clinical pharmacy as clinical pharmacist for master degree awarded at Jimma University, school of pharmacy.

**Challenges:** The barriers for the implementation of clinical pharmacists' services

**Student Interest in Pharmacy:** Student's willingness and choice to join pharmacy education.

**Adequate Training Site:** Is the environment or site to meet requirement for the provision of adequate training arrangement and supervision of qualified persons.

**Well Trained Mentor:** A Professional who fulfil educational requirement and have documented evidence to be accepted as pharmacy school instructor.

**Clinical Training:** Involvement and participation of clinical pharmacist and health care staffs in clinical training.

**Poor Attitude:** Low acceptance of the clinical pharmacy education and its service.

**Good Attitude:** High acceptance of the clinical pharmacy education and its service.

**Data Analysis:** The collected data was cleaned, coded, entered to Excel sheet. The entered data was subjected to statistical analysis using SPSS 21.0 software. Frequencies, percentages, cross tabs and Chi-squares were performed.

**Data Quality Control:** Questionnaire was pre-tested on 5<sup>th</sup> year students and if it is found to be good for data collection without modification it was proceed to the next step.

**Ethical Clearance:** Ethical clearance was obtained from Jimma University, School of pharmacy. Letter for cooperation from each level was obtained. All respondents had given written informed consent in English. Those who full the questionnaire were considered as consenting respondents.

## **RESULTS**

**Socio-Demographic Characteristics:** From a total of 165 students, 30 (18.2%) of them were post graduate clinical pharmacy students and 135 (81.8%) were undergraduate graduating pharmacy students. Among them 48 (29.1%) were female and 117 (70.9%) were males. The mean age of students was 25.47 ±0.877 (Table 1).

From the total study participants 129 (78.2%) were joined pharmacy department by their interest only but 36 (21.8%) were joined department of pharmacy not by their interest only. Based on the response of the study participants the presence or absences of role model clinical pharmacists affect their attitude on the training of clinical pharmacy. Out the total 86 (52.1%) respondents were have role model clinical pharmacist in the school but 79 (47.9%) of the respondents were not had role model clinical pharmacist in the school this may affect academic performance due to the attitude of students on the curriculum and training may not be positive (Table 2).

From the total respondents 146 (88.5%) were believed that they have great impact in clinical service for the patient care but 19 (11.5%) of respondents were not believed that they have impact for the patient care (Fig. 1).

Table 1: Socio-demographic characteristics of Graduating class pharmacy students and postgraduate clinical pharmacy students of JUMC

Socio-demographic characteristics		Frequency	Percentage (%)
Respective program	Undergraduate	135	81.8
	Post graduate	30	18.2
Sex	Female	48	29.1
	Male	117	70.9
Age	20-25	106	64.2
	26-30	52	31.5
	31-36	3	1.8
	37-45	3	1.8
	> 45	1	0.6

Table 2: Factors which affect the clinical pharmacy services at JUMC and the attitude of study participants

Factors		Frequency	Percentage
Satisfy by the attitude of physicians	Yes	66	40.0
	No	99	60.0
Joined pharmacy by interest	Yes	129	78.2
	No	36	21.8
Have advisor assigned by school	Yes	56	33.9
	No	109	66.1
Have role model clinical pharmacist	Yes	86	52.1
	No	79	47.9
Choose pharmacy if given 2 <sup>nd</sup> chance	Yes	91	55.2
	No	74	44.8
Adequate reference material	Yes	71	43.0
	No	94	57.0
Adequate premises, medication chart review for clinical pharmacist	Yes	59	35.8
	No	106	64.2

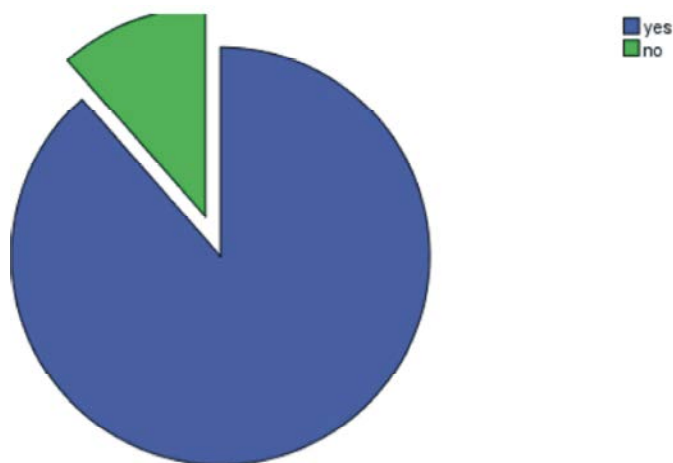


Fig. 1: The respondent's response on the impact of clinical pharmacist on patient care in clinical services

The majority of students about 40(24.2%) were disagreed that the school had a well-organized laboratory and 44(26.7%) of them were neutral about that community attachment sites were appropriately selected. Concerning pre-clerkship hospital exposure 28(17.0%) were strongly disagreed to be involved and 50(30.3%) and 49(29.7%) of them were neutral and agreed that the clerkship hospital sites are sufficient for the training respectively (Table 3).

Concerning the assigned instructors 58(35.2%) of them were neutral that instructors were competent. From the total study participants 28 (17.0%) of students were strongly disagreed that the class rooms were designed to facilitate the teaching-learning process. Twelve (12.1%) of them were strongly agreed and 50(30.3%) of them neutral that the number of students in clerkship site were given sufficient chance of practice. Fifty two (31.5%) were neutral that the mentors were well

Table 3: Attitudes of graduating class students' on challenges of clinical pharmacy training, Jimma University, School of Pharmacy

Asked statement	Frequency (%)				
	1	2	3	4	5
The curriculum is designed taking the countries current pharmacist need	38(23.0)	37(22.4)	38(23.0)	34(20.4)	18(10.9)
The number of students in your class is appropriate size for teaching-learning process	32(19.4)	39(23.6)	38(23.0)	37(22.4)	19(11.5)
The assigned instructors are competent.	19(11.5)	32(19.4)	58(35.2)	41(24.8)	15(9.1)
The class rooms are designed to facilitate the teaching-learning process	28(17.0)	37(22.4)	30(18.2)	47(28.5)	23(13.9)
The school has a well-organized laboratory.	37(22.4)	40(24.2)	34(20.6)	35(21.2)	19(11.5)
Community attachments sites are appropriately selected.	25(15.2)	28(17.0)	44(26.7)	50(30.3)	18(10.9)
I have pre-clerkship hospital exposure	28(17.0)	38(23.0)	37(22.4)	42(25.5)	20(12.1)
The clerkship hospital sites are sufficient for the training	17(10.3)	23(13.9)	61(37.0)	38(23.0)	26(15.8)
The number of students in clerkship site give you a sufficient chance of practice	17(10.3)	29(17.6)	50(30.3)	49(29.7)	20(12.1)
The clerkship mentors are well trained and experienced	22(13.3)	28(17.0)	52(31.5)	46(27.9)	17(10.3)
The mentors are punctual	27(16.4)	44(26.7)	40(24.2)	43(26.1)	11(6.7)
The mentors give me appropriate comment	17(10.3)	46(27.9)	49(29.7)	40(24.2)	13(7.9)
The prescribers are willing to hear my comment	22(13.3)	31(18.8)	66(40.0)	33(20.0)	13(7.9)
The prescribers accept my comment	19(11.5)	34(20.6)	57(34.5)	40(24.2)	15(9.1)

\*1=strongly disagree; \*2=disagree; \*3=fair; \*4=agree; \*5=strongly agree

trained and experienced. Eleven (6.7%) were strongly agreed that mentors are punctual and 49(29.7%) of them are neutral that the mentors gave them appropriate comment at clerkship site. From prescribes perspective; 22(13.3%) and 31(18.8%) of students were strongly disagreed and disagreed that prescribers were willing to hear their comments while 19 (11.5%) and 34 (20.6%) of them strongly disagreed and disagreed that prescribers were accept their comment (Table 3).

Based on the Lickert scale analysis result shows that almost all of the study participants were concluded that there is poor teaching and learning processes in Jimma University, School of pharmacy.

### DISCUSSION

Clinical pharmacy training has developed internationally to expand the role of a pharmacist well beyond the traditional roles of compounding and supplying drugs to patient oriented clinical role. To achieve these it's important to know and identify challenges faced in training of clinical pharmacy.

From the total of graduating class pharmacy students and post graduate clinical pharmacy students; 165 were included from which 48 (29.1%) were female and 117 (70.9%) were males. Among the study participants 129 (78.1%) of students were joined pharmacy by their interest. According to the study done in Pakistan about 68.6% of students were joined pharmacy by personnel interest [4]. This similarity showed that personal interest was the most important associated factor towards clinical pharmacy training [13-21].

Developments in pharmacy education are being implemented in many countries worldwide. The current study showed that 38 (23.0%) and 37 (22.4%) of the study participants were strongly disagreed and disagreed that the curriculum was designed taking the countries current pharmacist need. This finding contradicts with the current trend in shift of pharmacy training which was a change towards clinical patient oriented trainings. While in South and South East Asia region the course of education and curriculum changes degree title and duration of training set up challenges in acceptability of pharmacy education but clinical pharmacy training was given [22]. This similarity might be due to the fact that the implementation of curriculum of clinical pharmacy training in countries greatly affects student's attitude and acceptability of the field.

A number of students in class rooms should be suitable for teaching-learning process. Accordingly, the current study about 19 (11.5%) of student were strongly agreed that the number of students in their class were appropriate size for teaching-learning process. Instructors had a great role in the training to see qualified students. In this study about 58 (35.2%) of students were neutral that the assigned instructors were competent. The current study showed that about 28 (17.0%) and 37 (22.4%) of students were strongly disagreed that the classrooms were designed to facilitate the teaching-learning process and the school had well organized laboratory, respectively.

The community attachments sites should be appropriately selected. As the current study showed that 44 (26.7%) of them were neutral that attachments sites

were appropriately selected. The pre-clerkship hospital exposure of students and also clerkship hospital sites should give sufficient chance of practice for students.

Among the study participants, 28 (17.0%) of them were strongly disagreed that they had pre clerkship hospital exposure while 50 (30.3%) and 49(29.7%) of students were neutral and agree that the clerkship hospital sites were given sufficient chance of practice respectively. The students attitude towards their clerkship mentors indicates that about 40 (24.2%) and 49 (29.7%) were neutral that the mentors were punctual and give them appropriate comment respectively [23-37].

Clinical pharmacy students should provide pharmaceutical care service in hospital clerkship sites. To achieve these smooth relationships between prescribers and students' is mandatory. Among the study participants 22 (13.3%) of them strongly disagreed and 31 (18.8%) were disagreed that prescribers are willing to hear comments while 19 (11.5%) and 34 (20.6%) were strongly disagreed and disagreed that prescribers were accepted comments respectively. The study done in Jordan indicates that acceptance rate for pharmacist recommendation is 69.4% [38]. In northern university Boston 94.9% and 98.7% of providers indicated that pharmacist student's recommendations were appropriate and accurate respectively [38]. These differences might be due varied level of Economic, political and health care delivery system of the countries as well as the infant stage of growth of clinical pharmacy training in Ethiopia or new exposure of clinical pharmacist in clinical setting.

Further analysis was done on associated factors affecting the attitude of students on challenges of clinical pharmacy training; such as sex, student's interest to joined pharmacy, to have advisor assigned by school, to have role model pharmacist and to choose pharmacy if given 2<sup>nd</sup> chance analyzed on Mann-Whitney test. Accordingly, having role model clinical pharmacist was the only factor that had significant association on challenges of clinical pharmacy training.

### CONCLUSSION

The recent shift in the undergraduate *B. pharm* curriculum necessities the move towards clinical pharmacy practice. There was a growing need for pharmacists in Ethiopia to realize the recent changes in pharmacy practice worldwide. Although the perception of students regarding the curriculum change indicates that curriculum was not designed taking the countries current pharmacist need. The relationship between physician and

clinical pharmacist is essential to give appropriate pharmaceutical care for the patient care According to the study finding acceptance of students' comments and recommendation by prescribers in hospital clerkship sites is low. Therefore, the following points are forwarded as recommendations:

Findings of this study indicate that priority should be given for currently seen problems which greatly affect the field of study and quality of pharmacy professionals. The current shift of clinical pharmacy from dispensing to patient oriented pharmacy practice does need cooperative work among prescribers at clerkship sites and pharmacy students. Therefore, it's recommended to Jimma University, School of pharmacy to give awareness creation programs to physicians or prescribers about role of clinical pharmacist in patient care. It's recommended to give chance of early hospital exposure for students starting from 3<sup>rd</sup> year until graduating class. Clinical pharmacy training in Ethiopia is at infant stage but it's important to implement clinical pharmacy service in hospital setting. Finally I recommend to Jimma University; the university policy should be suitable for the implementation of current Ethiopian curriculum and it needs cooperative work with ministry of health and other health authorities to overcome these challenges.

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