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## CLINICAL PHARMACY IN ETHIOPIA: AN EXPERIENCE BASED LITERATURE REVIEW

### Introduction

In most developing countries, there is a paradigm shift as pharmacists' roles has dramatically expanded from dispensing to direct patient care. The pharmacy profession transformed towards patient-centered care to maximize the patient-related positive outcomes. The American College of Clinical Pharmacy defined clinical pharmacy (CP) as a health science discipline in which pharmacists provide patient care that optimizes medication therapy and promotes health, well-being, and care [1]. These CP's blends a caring orientation with specialized therapeutic knowledge, experience, and judgment for the purpose of ensuring optimal patient outcomes.

Ethiopia is Africa's oldest independent country located in the Horn of Africa. The country has a unique cultural heritage and is the home of oldest Christian Orthodox churches and monasteries. However, the health status of Ethiopia is poor similar to those in sub-Saharan Africa [2]. With a little number of pharmacies (304), and drug shops (250) in Ethiopia, inaccessibility of health care services and disparities exists in essential drug utilization [2]. Understanding the global

changes and the importance of pharmacists in patient care, in 2008, public universities revised the undergraduate pharmacy curriculum and launched the five clinical pharmacy program as National Harmonized Modular Curriculum (NHMC) [3]. In addition, the postgraduate program was also initiated focusing patient-oriented clinical pharmacy program at Jimma University with the support of University of Washington, USA [4]. Since 2012, the pharmacy section of the Ethiopian Hospital Reform Implementation Guidelines (EHRIG) by the Federal Ministry of Health (FMOH) and Ethiopian Food, Medicines and Health Care Administration and Control Authority (FMHACA) has also considered to include clinical pharmacy services as part of their pharmaceutical services in all hospitals. In believing that providing patient-oriented services by the pharmacists may promote the rational use of medicines, optimize treatment outcomes, minimize the risk, reduce the cost, and support the patient choices and decision, the clinical pharmacy services were initiated by the Federal government [5].

Many authors deem to express their reviews in different ways. To better explain the clinical pharmacy education, practice, and research in Ethiopia, this review was nurtured with the author experience at the University of Gondar.

### Evolution of clinical pharmacy workforce in Ethiopia:

The dynamic mutual partnership between Addis Ababa University (AAU) and Howard University, United States of America from 2007-2014 had resulted in a positive outcome in training the faculties, and developing new five years clinically-oriented B.Pharm program in 2008. In addition, forty pharmacists and physicians were trained in ten reputed institutions to serve as preceptors during the clinical pharmacy clerkship attachments in their final year. However, to a better understanding



of clinical pharmacy services in health care, six physicians from Ethiopia were taken to various teaching hospitals in the United States and provided a short training to them [6].

University of Gondar (UOG) was established in 1954 and is one of the oldest university in Ethiopia. UOG was a public health college and training center (PHC & TC) in joint efforts between imperial Ethiopian government, WHO, United States operation mission to Ethiopia, and UNICEF [7]. The school of pharmacy was established in the year 2000 and started to train pharmacy at diploma and bachelor level. Adopting NHMC in 2008, the undergraduate pharmacy curriculum was focused towards clinical-oriented pharmacy program. In 2012, two MSc. Clinical Pharmacy faculties from Jimma University and two qualified doctor of pharmacy (Pharm.D) professionals from India were recruited to establish clinical pharmacy unit in University of Gondar (UOG). The purpose of establishing this unit to facilitate the clinical teaching and learning process to final year B.Pharm clerkship students in the UOG. Successively, all the students were placed in various hospitals and clinical sites to facilitate the clinical pharmacy services. At present nearly 500 students from various public universities in Ethiopia have graduated and most of them were placed in various hospitals facilitating clinical pharmacy workforce in Ethiopia. Understanding the huge demand of specialized clinical pharmacists' workforce in Ethiopia, in the year 2015, UOG became the second university to launch postgraduate clinical pharmacy program [8].

Further, to strengthen the clinical pharmacy services throughout the country, a massive countrywide in-service special training was provided to all the clinical pharmacists under the banner of "Building local capacity for clinical pharmacy services in Ethiopia through

holistic in-service training approach" in 2015 [9]. This training program was drafted and organized by System for improved access to pharmaceutical system (SIAPS) and implemented by EHRIG. During this training,

all the pharmacy staff were also engaged to revise the curriculum to suit the current changes and designed training materials. A total of eight rounds of training were conducted over the past 3 years.

### **Drug Information Center**

WHO defined drug information center (DIC) as an independent center that is accessible to any health professional regarding all queries about drugs [10]. Providing drug information is one of the most fundamental role of pharmacists' working in hospital or in community pharmacies as their extended roles. In Ethiopia, to provide evidence-based drug information services through drug information center (DIC), Tikur Anbessa (Black Lion) hospital has taken initiation to establish first DIC in 2009, and received extensive financial support from US President's Emergency Plan for AIDS Relief (PEPFAR) and CDC/Ethiopia as well as from the World Bank. However, technical support to run the DIC was obtained from Howard University, USA [11]. Almost 300 pharmacists and other health workers were trained and eight satellite DICs were established in various public universities. In UOG hospital, the DIC was established in December 2012 with the support of United States agency of international development (USAID) and SIAPS. Initially, the DIC was actively managed by the clinical pharmacy faculties. However, due to lack of full-time employment, continuity of services and lack of trained staff, the DIC became non-functional for a period of one year up to mid-2014. In 2014, the UOG hospital re-opened the DIC by recruiting one full-time clinical pharmacists to provide DI services. Currently, the DIC is functional on all working days for



eight hours and is also serving as a DIC training center for both students and pharmacists.

### *Clinical Pharmacy Education*

The revised five-year NHMC curriculum for undergraduate pharmacy comprises various

clinical and pharmacy subjects such as clinical psychology, pharmacotherapy, drug informatics, communication skills for pharmacists, and pharmacoeconomics etc. However, the fifth year of the curriculum has one-year clinical training components that include both hospital and community settings. In the total of 147 credits hours prescribed, 32 weeks of clinical rotations and a research thesis were also included. In 2015, UOG has launched two years of MSc in clinical pharmacy program which includes 33 credit hours of teaching, 38 weeks of internship and a research project. Advanced subjects such as pathology, diagnostic radiology, physical diagnosis, clinical pharmacokinetics and pharmacogenomics, pharmacoepidemiology, research methodology and advanced pharmaceutical care were included along with integrated pharmacotherapeutics. The 38 week rotational Internship is focused on hospital pharmacy (2 weeks), internal medicine (10 weeks), pediatrics (9 weeks), surgery (5 weeks), oncology (4 weeks), psychiatry (4 weeks), gynecology/obstetrics (2 weeks) and drug information center (2 weeks).

The settings of clinical training was expected to provide an effective learning experience to pharmacy students working with other health care professionals under the guidance of expert preceptors. Various evaluations were conducted observing the clerkship experiences of students, roleplay services of the student pharmacists, and that also investigated students' attitude and perceived barriers to provide pharmaceutical care [3]. Preceptors

were evaluated on their abilities to provide them with the intended experience of clinical skills [12], and perceptions of clerkship students and preceptors towards clinical teaching behaviors [13] and assess ward-based clinical pharmacy services in clinical wards [14]. All these indicate clinical pharmacy education in UOG is continuously striving to

produce global standard clinical pharmacy workforce.

### **Clinical Pharmacy Practice**

FMHACA is a regulatory authority constituted under FMOH to provide high-quality healthcare services to Ethiopian population. Various efforts have been made to initiate clinical pharmacy services in public health facilities. To better understand the outcomes of their practice, pharmaceutical fund and supply agency (PFSA) has taken initiation to evaluate their clinical pharmacy services in selected public hospitals in Ethiopia. The results of this qualitative and quantitative evaluation registered positive outcomes in improving patient quality of care and treatment outcomes. However, identified barriers such as lack of uniformity across hospitals, practicing guidelines, and standard operation procedures (SOP) to promote service delivery [15].

Understanding these barriers and to facilitate the clinical pharmacy services in health care system. PFSA in collaboration with SIAPS drafted the Standard Operation procedures (SOP) manual and this project work was funded by USAID. As a result of these efforts for service excellence, "*Standard Operation Procedure manual for the provision of clinical pharmacy services in Ethiopia*" was developed [16]. This manual has step-by-step procedures for the provision of clinical pharmacy services for inpatients, along with the necessary documentation and reporting. This hands-on reference for pharmacists providing clinical



pharmacy services was currently used across Ethiopia to standardize the practice in all hospitals.

### Clinical Pharmacy Research

Since clinical pharmacy is adopting research-based academic education and professional practice, research activities are essential component in this discipline. To better

understand the research practice among clinical pharmacy specialists, a literature review was conducted in PUBMED using keywords: “clinical pharmacy”, “Pharmacy Practice” “Gondar”, and “Ethiopia”. A total of 242 research items were revealed. However, to better the contribution of clinical pharmacists in research activities, the search strategy was restricted to the literatures published between 2012 and 2017. It revealed a total of 234 research items and interestingly 101 papers were attributed to the clinical pharmacy faculties of UOG, Ethiopia. This reflects the clinical pharmacist's potentiality and their dedication towards evidence-based pharmacy practice. However, some of the important things that need to be considered as UOG is located in resource-limited setting and Ethiopia is one of the poorest country, poor infrastructure, difficult to access the scientific literatures, lack of funding sources to perform research, and lack of experts from developed countries to support research education are some of the perceived barriers that were noticed during our experience. Despite these difficulties and predicaments, researchers in clinical pharmacy in Ethiopia are making progress.

### Conclusion

This experience-based literature review on clinical pharmacy in Ethiopia hopefully provides greater insight in understanding the clinical pharmacy status in Ethiopia. Clinical pharmacy practice in Ethiopia is being

recognized and UOG faculties deliver quality education, service, and contribute to research. Understanding the potential barriers and recognizing their efforts, international organizations and institutions should come forward to strengthen and boost clinical pharmacy profession in Ethiopia.

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