



## Review Article

# Progress of Clinical Pharmacy Education and Practice in Ethiopia: A Review

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### A B S T R A C T

In past few years, the pharmacy profession in Ethiopia has evolved significantly in relation to education and practice. Currently, the pharmacists are recognized as an integral part of multidisciplinary approach of Ethiopian health care system. The Ethiopian pharmaceutical education and practice has a long journey since its inception. However, the current published literatures available till date provides very few details about the transitions in pharmacy education and practice in Ethiopia. The aim of this review is to highlight and discuss the progress of pharmacy education and practice in Ethiopia in sequential manner. To gather the information's a thorough search of published and unpublished literatures was conducted using various search engines such as, PubMed, Google and other relevant websites with key words like, Clinical pharmacy, Pharmacy, education, Ethiopia. It concludes that although the pharmacy education and practice in Ethiopia is rapidly growing towards patient care, but emphasis should be given for devising some system for the assessment of quality of education and services being provided. Furthermore, Ethiopia is experiencing a shortage of man power in pharmaceutical sector as well, so policy makers may consider for initiating industry oriented Bachelors program in pharmacy along with the existing clinically oriented Bachelor of Pharmacy program to fulfill the country need.

**Key Words:** *Clinical Pharmacy, Education, Developing Countries, Ethiopia*

## 1. INTRODUCTION

Globally, pharmacy education and practice has undergone drastic changes with the advancement in technology, scientific discoveries and emerging patient care needs. It emphasizes the need for development of adequately trained pharmacy workforce with sound academics and institutional setup to render skill based education and training<sup>1</sup>. For instance, in Ethiopia a sharp change was noticed since 2008 onwards to implement patient centered pharmacy education and

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practice. However, still the number of pharmacy practitioners in Ethiopia are much lesser than the WHO recommended ratio (1/2000 people)<sup>2</sup>. This huge short fall of pharmacists in Ethiopia can adversely affect the access and availability of medicines to the Ethiopian population. To tackle the shortage of pharmacy work force, currently many public and private institutes are involved in educating students in various levels of pharmaceutical education in Ethiopia. Further, this review is aimed to highlight and better understand these changing trends in pharmaceutical education and practice in Ethiopia since its inception.

### ***Ethiopian Pharmaceutical Education: Historical Perspective***

The basic Pharmaceutical Education in Ethiopia initiated with the hospital dispensary certificate program. It was an auxiliary medical training Program, launched in Minilik II hospital in 1943. Almost twelve students were enrolled in the program, the criteria for admission and other aspects were not clear but at the end of the training only four students were awarded Hospital dispensary certificate. Successively in 1947, the imperial medical research institute started one year training program as certified pharmacy assistant. The basic qualification required for attending this program was sixth grade. Further, the course comprised of basic sciences and some pharmacy subjects. In addition, English language proficiency was also a criteria for admission<sup>3</sup>.

Modernization of Ethiopian pharmacy education started with the establishment of pharmacy technician school in the premises of Minilik II Hospital. The program was of two year duration and minimum ninth standard of qualification was kept as criteria for entrance examination. The curriculum of the program consists of important subjects of pharmaceutical sciences and life sciences like Physiology<sup>4</sup>.

A boost in pharmacy education was observed in year 1961, with the establishment of school of pharmacy in Addis Ababa University (AAU) and was running as a unit under faculty of sciences. Successively, on year 1978 it became an independent faculty consist of four departments such as pharmacology, pharmaceutics, pharmaceutical chemistry, and pharmacognosy. In 1965 the first batch of Bachelor of pharmacy (B.Pharm) graduated from AAU in a curriculum based on product or industry aspects<sup>5</sup>.

### ***Progress of Ethiopian Pharmaceutical Education towards Patient Care***

In 2008, all public pharmacy institutes in Ethiopia revised their undergraduate pharmacy curriculum to focus on clinical pharmacy or patient care aspects. The Ethiopian Pharmaceutical Association (EPA) took the initiative in collaboration with Strengthening Pharmaceutical Systems program (SPS) and other stake holders to organize a national workshop for harmonizing the curriculum. Successively, the nationally harmonized clinically oriented B.Pharm curriculum was finalized and circulated to public and private pharmacy institutions throughout the country. The revised curriculum comprises of various clinical subjects such as, pharmacotherapy, drug informatics, communication skills for pharmacist, pharmacoeconomics etc. In addition, the fifth year of the curriculum has one-year clinical training component in hospital as well as in community setup. Since 2015, three batches of clinical pharmacists have been graduated and placed in various hospitals and other areas of the healthcare system<sup>6</sup>. The overview of old and new B.Pharm curriculum is given on (Table 1). In 2009, another big achievement was observed in the history of Ethiopian pharmaceutical education, with the initiation of country's first graduate program in clinical pharmacy at Jimma University (JU). The main objective of the program was to produce competent

faculties for clinically oriented B.Pharm program and practicing clinical pharmacists. The program was developed in collaboration with University of Washington, EPA, and SPS program of Management Sciences for Health. The curriculum was based on experiential learning approach focusing on community, where postgraduates were trained in teaching hospitals and local health centers. The graduate program was nomenclature as Master of Science in clinical pharmacy (MSc.)<sup>7-9</sup>. Overview of MSc. Clinical pharmacy curriculum is given in (Table 2).

**Table 1: Overview old Vs new Ethiopian B. Pharm Curriculum**<sup>5</sup>

Parameter	Old	New
Duration of study	4	5
Total credits hours	139	147
Courses on Biomedical & Natural Sciences	23%	16.30%
Courses on Pharmaceutical Sciences	43.20%	34%
Courses on Behavioral, Social & Administrative Pharmacy	10.10%	13%
Courses on Pharmacy Practice	9.40%	14.30%
Experiential training	2.90%	3.3%+ 32 weeks internship

**Table 2: Overview of Postgraduate Clinical Pharmacy Curriculum**<sup>20</sup>

Course Title	Credit hours
Integrated Therapeutics I	4
Integrated Therapeutics II	4
Integrated Therapeutics III	4
Adv. Biostatistics	3
Clinical Toxicology	1
Drug Information and Literature Evaluation	3
Physical Diagnosis	N/C
Adv. Biopharm. and Clinical pharmacokinetics	3
Pharmaceutical care	4
Pharmacoepidemiology	2
Pharmacoeconomics	2
Research Thesis	6
Clinical Rotation	32 Weeks
Total credit hours	36 credit hours +32 weeks of clinical attachment.

## 2. CURRENT SCENARIO

The dynamic partnership between AAU and Howard University from 2007 to 2014 had a huge impact on clinical pharmacy education and practice throughout the country. The outcome of the partnership resulted in development of a new five years clinically-oriented B.Pharm program. In addition, guidelines for clinical rotation in hospitals and community pharmacy were framed, so that students can get practical experience. Nearly forty pharmacist and physicians were trained from ten institutions to serve as preceptors during attachments in clinical pharmacy program. Moreover, six physicians from Ethiopia were trained in American teaching hospitals for better understanding the importance of clinical pharmacy services in the healthcare system. In 2013, nearly 52 students were graduated from AAU in clinically-oriented B.Pharm program. Among these 52 students, 31 got placement in Tikur Anbessa Hospital and remaining 21 were deployed in various clinical sites of Ethiopia under Federal Ministry of Health. At present 426 new clinical pharmacists were graduated throughout the country, as six other public universities in Ethiopia also adopted the same harmonized curriculum. Further with the help of this partnership, a Drug Information Center (DIC) was established at Tikur Anbessa Hospital. Almost 300 pharmacist and other health workers were trained in providing evidence based drug information services. Further eight more satellite DICs were established in other public universities of Ethiopia<sup>10</sup>. Considering the changing trends in pharmaceutical education throughout the country, In 2013 two Doctor of Pharmacy (PharmD.) qualified teaching faculty were recruited from India by school of pharmacy in University of Gondar (UOG) to facilitate the clinical teaching and learning process of newly started clinically-oriented B.Pharm program. A huge positive impact was noticed among the students based on their

acceptance and satisfaction level. Successively, in year 2015 UOG became country's second university next to JU to launch graduate program in clinical pharmacy.

To strengthen the clinical pharmacy service throughout the country, a special training was conducted under the banner of "Building Local Capacity for Clinical Pharmacy Service in Ethiopia through a Holistic In-Service Training Approach". The program was a massive countrywide in-service training program for clinical pharmacist to implement the Ethiopian Hospital Reform Implementation Guideline (EHRIG). The program was drafted and organized by System for improved access to pharmaceutical system (SIAPS) based on country needs. The JU was selected as a host for its reputation in clinical pharmacy education. It arranged the setup for training and the clinical pharmacy staffs were engaged in revision of curriculum for training. They added various pharmacotherapy topics and designed training materials. Total eight rounds of training were conducted over a period of 3 years, almost six training were given in JU, and two others were given in UOG and Mekelle University<sup>6</sup>. The training program was a successful initiative and first of its kind in whole country.

### 3. CONTRIBUTION OF INDIVIDUALS AND VARIOUS STAKE HOLDERS IN MOLDING CLINICAL PHARMACY EDUCATION AND PRACTICE IN ETHIOPIA

Dr. Bisrat Hailemeskel is a renowned clinical pharmacist of Ethiopian origin, who completed his B.Pharm and MSc. Degree from AAU, Ethiopia. Further, he completed his Doctor of Pharmacy Degree from University of Toledo, Ohio, United States of America (USA). He worked in various institutions in USA and gained experience in academics as well as in practice. In July 1997, Dr. Bisrat joined Howard University as an assistant professor and successively

promoted to associate professor in year 2002. His involvement in Ethiopian pharmaceutical education is attributed to teaching an undergraduate program in faculty of medicine at AAU from 2003. Thereafter, he is frequently visiting Ethiopia for providing training and valuable consultation on pharmaceutical education. Further, he played a key role in establishment of Howard – Addis Ababa University Twinning Partnership, aimed to emphasize the role of pharmacist in rendering pharmaceutical care. Moreover this partnership resulted in drafting of 5 years curriculum of B.Pharm and post graduation program in pharmacy practice<sup>11</sup>.

**Federal Ministry of Health (FMOH):** FMOH is a governmental regulating body for health care sector in Ethiopia, having objective of improving the accessibility and quality of services at various level of country's health care system. In continuation of health care reforms FMOH has developed a countrywide guideline in collaboration with SPS. This is known as Ethiopian Hospital Reform Implementation Guideline (EHRIG). Considering the crucial role of clinical pharmacy in health care, FMOH has created a special chapter for pharmacy in the EHRIG and mandated the provision of clinical pharmacy services in all hospitals. The provision of clinical pharmacy emphasizes the role of pharmacist in safe, effective, and economic use of medicines to enhance the treatment outcome. Since 2010, all public hospitals in Ethiopia has been implementing these guidelines<sup>12-14</sup>.

**Ethiopian Pharmaceutical Association (EPA):** Is a non-governmental pharmacy organization in Ethiopia, It has significantly contributed for the growth and development of pharmaceutical education and practice in Ethiopia. EPA in collaboration with SPS and other governmental agencies took various initiatives such as, conducting national seminar on curriculum development for harmonized curriculum of clinically-

oriented B.Pharm program and significantly contributed in drafting various guidelines for clinical pharmacy services in EHRIG. Currently, EPA is providing continuous professional development (CPD) programs, accreditation of pharmacy and related courses and many more<sup>15-17</sup>.

**Food, Medicines and Health Care Administration Authority (FMHACA):** FMHACA is a regulatory authority constituted under FMOH. With a vision of providing high quality health care services and products to Ethiopian peoples. To protect the public health by assuring the safety and quality of pharmaceutical products and health care service through licensing, registration and inspection of health care providers<sup>18</sup>. In addition, to emphasize the role of clinical pharmacist in health care system and to promote the rational use of medicine in country, FMHACA has drafted the guidelines for establishment and operation of drug information center (DIC) in Ethiopia. In the operation DIC guideline there is a clear description for establishment of local, regional, and national drug information centre (DICs). Furthermore, it provides in-depth activities of DICs like, various training and education to the health professionals, conducting research and participation in drug use evaluation studies and many more<sup>19</sup>.

#### 4. FUTURE OF CLINICAL PHARMACY EDUCATION AND PRACTICE IN ETHIOPIA

The sustainability of this clinically oriented pharmacy education and practice relies on various aspects such as, producing highly qualified, skilled, and knowledgeable pharmacy workforce, rendering continuous clinical pharmacy services in health care, and accomplishing the other societal needs based on local setup. These can be achieved by devising some quality assurance system which aims to improve and standardize the education and practice of pharmacy profession in Ethiopia. Few recommendations, which

may be considered for future perspectives of pharmacy education and practice

- **Establishment of National Board of Pharmacy:** There is a need of an independent national board of pharmacy under FMOH which should solely look after the various aspects of pharmacy profession such, granting or renewal of practicing licensure, inspection of educational institutions, framing or revising Pharmacy curriculum, conducting CPD and many more.
- **Increasing the number of faculty:** Skillful faculties are essential for expansion of clinical pharmacy throughout the country. There is a need of role model practicing clinical pharmacists to build confidence among students by precepting and mentoring at their clinical sites.
- **Multidisciplinary approach:** Engaging mentors to practice pharmaceutical care along with other health professionals in the clinical setup can initiate a new era in the pharmacy practice in Ethiopia. In addition, strengthening pharamcovigilance, documentation skills and therapeutic procedural knowledge can uphold clinical pharmacists' responsibilities in Ethiopia healthcare.
- **Local and International collaboration:** The pharmacy schools should build up collaboration with all the national healthcare organizations to strengthen the pharmacy practice in Ethiopia. Further, school should search for International organizations and institutions to support exchange of faculties, students and research.

#### 5. CONCLUSION

Pharmacy education and practice in Ethiopia is rapidly growing towards patient care, but emphasis should be given for devising some system for the assessment of quality of education and services being provided. Furthermore, Ethiopia is experiencing a shortage of

man power in pharmaceutical sector as well, so policy makers may consider for initiating industry oriented B.Pharm program along with existing clinically oriented B. Pharm program to fulfill the country need.

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