Information Guide

for students who aspire to join Health Science Education

ADDIS ABABA
OCTOBER, 2019

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MINISTRY OF HEALTH-ETHIOPIA

Public Health Officers Association of Ethiopia
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EAA

ETHIOPIAN MIDWIVES ASSOCIATION

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October, 2019

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Acronyms

AAU Addis Ababa University

CRC Compassionate and Respectful Care

CT Computed Tomography

EAA Ethiopian Association of Anesthetists

EHP Environmental Health Program

EMA Ethiopian Education Association

EMwA Ethiopia Midwives Association

ENA Ethiopia Nurse Association

ENA Ethiopian Nurses Association

EPA Ethiopia Pharmaceutical Association

EPHA Ethiopia Public Health Association

EPHI Ethiopian Public Health Institute

ERRTA Ethiopian Radiographers and Radiologic Technologist Association

FIP International Pharmaceutical Federation

GPs General Practitioners

HRH Human Resource for Health

HSCM Health Supply Chain Management

HSDP Health Sector Development Program

HSDP IV Health Sector Development Program Four

HSTP Health Sector Transformation Plan

ICCMH Integrated Clinical and Community Mental Health

ICN International Counsel of Nurses

ICU Intensive Care Unit

LE Life Expectancy

MDs Medical Doctors

MoH Ministry of Health

MPH Masters of Public Health

MRI Magnetic Resonance Imaging

NGOs Non-Governmental Organizations

NIMEI New Innovative Medical Education Initiative

NIMEI New Innovative Medical Education Initiative

PHOAE Public Health Officers Association of Ethiopia

UNFPA United Nation Population Fund

UNICEF United Nation International Children Emergency Fund

UNRRA United Nations Relief and Rehabilitation Administration

US Ultra Sound

WHO World Health Organization

Foreword

Compassionate, respectful and patient-centered care is a top priority in our efforts to improve quality and equity in service delivery. Reform in the recruitment of students for health science and medicine program is one of the strategies to implement Compassionate, Respectful and Caring (CRC) in the Ministry of Health (MoH). That is why CRC agenda requires ownership and engagement of the leadership at different levels of the system as well as involvement of higher educational institutions as stakeholders. For this big agenda to be achieved production of skillful and passionate health professionals is crucial.

Thus, Ministry of health calls for health science colleges and institutions to enroll medical and health science students based on their passion with brief awareness of each discipline. In order to address this issue, Ministry of Health in collaboration with universities and health professional associations has developed an information guide for students who aspire to join health science education in fourteen different health disciplines.

Obviously, development of this information guide for students who aspire to join health science education is an important step to address awareness gaps on each discipline. I am grateful to all members of the technical working group representing different universities and professional associations for their expertise and valuable contribution in the development of this important information guide.

I hope that all universities and health science colleges will make the document accessible to all students and, as a result, passionate students who are well informed about their future profession will join the sector. Thus, together we can ensure that every one is treated with compassion, respect and dignity.



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- Ethiopian Environmental Health Professionals Association,
- Ethiopian Radiography and Radiology Professional Association,
- Ethiopian Optometry Professionals Association and

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Executive Summary

In the last decade, with massive scale up of health infrastructure, health workforce development and deployment, Ethiopia has achieved a lot in regards to Human Resource for Health (HRH). To mention some, the number of medical schools has increased from 7 to 35, the number of midwives increased from 1,270 in 2009 to 11,349 in 2015, and the overall health professionals to population ratio increased from 0.84 per 1000 in 2010 to 1.5 per 1000 in 2016.

While considerable health gains have been achieved in the provision of our healthcare system, including human resource development, there is still a growing concern about the quality of the service and the perceived lack of compassion in its delivery. Compassionate and Respectful Care (CRC) is critical in building a sustainable, equitable and healthy future for all.

Even though the reasons behind the poor quality of the service are multi-dimensional, the role of health professionals in this regard is obviously crucial. In fact, many of the health professionals have joined the sector with minimum or no information about their future profession, taking the opportunity just as a means to employment, without realizing if that is their real passion or not. This, of course, has its own negative consequences in having compassionate, caring and respecting health professionals.

Thus, with the objective of developing compassionate, respectful and caring professionals, the Ministry of Health together with professional associations and universities, has initiated developing an informative document for students in preparatory schools and 1st year university students who aspire to join the health sector in different professional categories. The document, titled 'Information Guide for Student Who Aspire to Join Health Science Profession' has an introductory part at the beginning, followed by specialty based detail informative guide for 14 selected specialties, namely: anesthesia, nursing, midwifery, medicine, environmental health, medical laboratory, medical radiologic technology, public health officer, pharmacy, optometry professions, However, there are some remaining

specialties in addition to the above listed like dentistry, and the universities you will join are expected to give you similar explanation.

The Introductory Part

It starts with a definition of health, and then the types of health services in the country followed by the historical background of health services in Ethiopia. It states that until 1991 the health system in Ethiopia was centralized and services were mainly concentrated in major urban areas. Then it goes on eliciting the major cross cutting issues in health, the national health status of Ethiopia, the health system structure and the health policy of the country. The document states that despite the major stapes taken by the government to improve the health status of the nation and the significant achievements gained on this regard, there is still a high morbidity and mortality rate in the country mainly due to major preventable and communicable diseases and nutritional disorders.

Following the endorsement of a new health policy in 1993, a 20 years sector plan, "Health Sector Development Program" (HSDP) was developed. The plan was accomplished in 2015 with remarkable achievements, such as the child mortality was reduced by 67%, the maternal mortality was reduced by 69%, and the life expectancy (LE) of the Ethiopians was increased from 45 in 1990 to 64 in 2015. Taking these breakthrough achievements as a momentum, the health sector has developed a five-year ambitious plan called "Health Sector Transformation Plan" (HSTP) for a period of 2016-2020.

The vision, mission and core values of the sector are further incorporated in to the document followed by the description of Human Resource for Health (HRH), its current status in Ethiopia, projection for 2020 and 2025 and finally the policy framework of the HRH. The introductory part of the document discusses the issues of being Compassionate, Respectful and Caring health professional. This part starts with the concept of professionalism, then goes to the definition of CRC and concludes with issues related to the benefits of CRC from different perspectives.

The Second Part (Professions Specific)

In this part of the document, the historical back ground of each specific profession, what it does mean to being that specific professional, the core competencies, the career possibilities, the opportunities and challenges related with that profession, and finally things that a student has to consider before making a decision to join that specific profession are depicted for all 14 selected professions (mentioned above) one after the other.

Even though most of the issues raised here are profession specific, there are also some points that are shared by all professions, such as: the professional satisfaction acquired automatically by saving lives and relieving pain of others, The fact that health professionals of any category are highly demanded in the market; able to serve in public and also in the private sector; are less compensated as compared to what they deserve; that the professions are full of stress; that there is a high work load and additional working hours; and so on are the opportunities and challenges commonly shared by all or most of the professions.

Finally, on the issue of things to be considered, there are profession specific points as well as things that can be related to almost all professions in the health sector, such as CONFIDENTIALITY, IMPARTIALITY, and LOYALTY.

A health professional of any category should keep the information that he/she owns from his/her patient/client very CONFIDENTIAL. This is about confidentiality. Moreover, he/she should serve everyone equally no matter what the patient's/client's age, sex, religion, social status, income …etc is, and this is what we mean by IMPARTIALITY.

PART ONE

PART ONE

1. Introduction

1.1. General Concept of Health

The modern understanding of health became official when the World Health Organization (WHO), at the time of its establishment in 1948, included the definition of health in its constitution.

According to WHO's definition "Health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity". It is extended to include the ability to lead socially acceptable and economically productive life.

1.2. Meaning of Human Health Science

Health science refers to a large group of disciplines related to the delivery of health care to humans through the application of science, engineering, mathematics and technology. In other words, it is the field in which knowledge is taken from pure science and other related sources and applied to practical and clinical practices to maintain and improve the health of human being. The branches of health science are virtually endless, spanning traditional and conventional Western medicine as well as alternative and folk medicine.

1.3. Concept of Health Services

Health services cover promotive, preventive, curative, rehabilitative and palliative care. These services are centered on making health care accessible, of high quality, and patient-centered. Hence, different types of care providers of adequate number are necessary to offer effective and efficient health services

1.4. Historical Back Ground of Health Services in Ethiopia

The modern health care service in Ethiopia was introduced at the end of the 19 th and the beginning of the 20th century.

- The first hospital was opened in Addis Ababa by the Russian Red Cross Mission in 1897;
- Harar Hospital was opened in Harar city in 1903 by Ras Mekonnen, which was Ethiopia's first modern-style leprosarium.
- In 1908, a directorate for health services was opened as a department within the Ministry of Interior;
- In 1909 the first public hospital (Menillik II Hospital) was established in Addis Ababa.

Before 1991, the health system in Ethiopia was centralized and services were mainly concentrated in major urban areas. In addition, the role of the private sector in the health system was insignificant.

In 1993, a new health policy was developed following a critical examination of the nature, magnitude and root causes of the prevailing health problems of the country and awareness of newly emerging health problems.

1.5. Cross-Cutting Issue in Health Sector

Cross-cutting issues and commitments in health are topics that affect all aspects of a program and therefore need special attention. They should be integrated into all stages of programs and projects, from planning to impact assessment.

Major cross-cutting issues in health may include:

a. The delivery of social protection and essential public health services for all;
b. Scaling up efforts to end hunger and malnutrition;
c. Generating full and productive employment and decent work for all;
d. Protecting the ecosystem;
e. Promoting peaceful and inclusive societies, gender equality and the empowerment of women and girls, children and youth.

1.6. The Current National Health Status and Health System Structure of Ethiopia

1.6.1. National Health Status of Ethiopia

The Ministry of Health is working to improve the health status of the Ethiopian people through improving the healthcare delivery system. The government had made significant investments in the health sector which has led to improvements in the health outcomes.

Despite major steps to improve the health of the population in the last two decades, Ethiopia's population still face a high rate of illness and death.

The major health problems of the country are largely preventable communicable diseases and nutritional disorders. However, other Non-communicable diseases (Cancer, diabetes, respiratory and heart diseases, etc.) are also rising.

1.6.2. Health System Structure of Ethiopia

The health service delivery is structured with a three-tier system: primary, secondary and tertiary level of care. The primary level of care includes primary hospitals, health centers and health posts, whereas the general hospitals are included in the secondary and specialized hospitals in the tertiary.

A health post provides promotive, preventive and basic curative services for a population of 3000 to 5000; where as a health center serves about 25,000 in rural areas and 40,000 population in urban areas. A primary hospital is the first referral unit in the primary care level and is expected to serve a population of about 100,000.

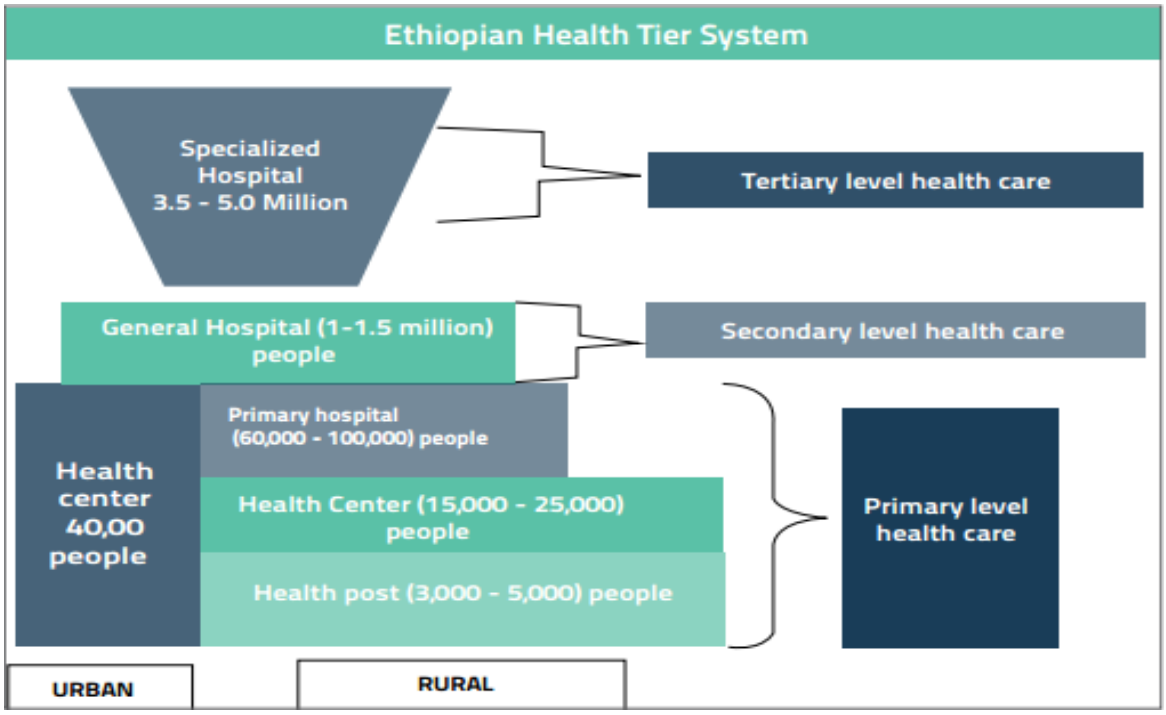


Figure 1: The Ethiopian health tier system (from the health sector transformation plan)

1.7. Ethiopian Health Policy and Health Sector Transformation Plan (HSTP)

In 1993, a new Ethiopian Health policy was endorsed by the then transitional government of Ethiopia to address major health problems such as high child and maternal mortality, low average life expectancy; and high morbidity and mortalityin the general population caused by communicable diseases, and malnutrition,

The major aspects of the health policy are:

1. Democratization and decentralization of the health service system;
2. Development of promotive and preventive components of the health service system;
3. Development of an equitable and acceptable standard of the health service system;
4. Promoting and strengthening of inter-sectoral activities;
5. Strengthening of national self-reliance in health development;
6. Making health care accessible for all segments of the population;
7. Working closely with neighboring countries, regional and international agencies;

8. Development of appropriate capacity building;
9. Creating mechanisms to make health care affordable; and
10. Promotion of the participation of the private sector and non-governmental organizations.

Following the endorsement of the new health policy, as part of the implementation plan the health sector has developed, the 20 years rolling plan called Health Sector Development Program (HSDP) from 1997 - 2015, which had been implemented in 4 phases (HSDP I-IV). The Health Sector Development Program (HSDP) has been accomplished with remarkable achievements such as:

- Life expectancy has increased from 45 in 1990 to 64 in 2015;
- Maternal mortality (deaths related to pregnancy and labour) rate has been reduced by 69%; and
- Under-five child mortality rate also has been remarkably reduced by 67%.

After the successful accomplishment of the HSDP the country has developed a five year ambitious transformation plan called Health Sector Transformation Plan (HSTP) that focuses on the four pillars to transform the country's health system.

The four strategic pillars are:

1. Excellence in health service delivery
2. Excellence in quality of services
3. Excellence in leadership and governance
4. Excellence in health system capacity

The HSTP has four transformation agendas:

1. Equity and quality in health care
2. Information revolution
3. Woreda transformation
4. Developing Compassionate Respectful and Caring health care professionals

The Ethiopian Health Sector has the following corporate identities:

Vision: To see healthy, productive and prosperous Ethiopians

Mission: To promote health and wellbeing of Ethiopians through providing and regulating a comprehensive package of promotive, preventive, curative and rehabilitative health services of the highest possible quality in an equitable manner.

Core values:

- Community first
- Integrity, loyalty, honesty
- Transparency, accountability, confidentiality
- Impartiality
- Respecting the law
- Be a role model
- Collaboration
- Professionalism
- Change/Innovation
- Compassion

1.8. Human Resource for Health and Policy Framework

1.8.1. Human Resource for Health

According to WHO Human resource for health also known as 'Health human resource' is defined as all people engaged in actions whose primary intent is to enhance health. It is identified as a critical component of the health system and links with other building blocks in the health system. The human resource for health comprises of physicians, pharmacists, nurses, midwives, dentists, anesthetist, radiographers, public health officers, physiotherapists, medical laboratory technologists, environmental and occupational health officers, optometrist and other healthcare providers.

Regarding the size and distribution of health workers, the number of health workers in a country is a key indicator of the effectiveness of human resource for health. Most low-income countries suffer from a severe shortage of health professionals. In Africa, the proportion of health workforce is 0.84 per 1000 population in. Ethiopia's status is not far

from this. In 2016, the proportion of health workforce in Ethiopia was 1.63 per 1000 population (Ethiopian national HRH strategic document). This fells below the WHO recommended minimum of 2.3 health workers per 1000 population.

Thus, the health system of Ethiopia needs an increasing number of health professionals. The result of the HRH projection shows that the total number of health professionals will progressively increase from the current number of….to 233,422 by 2020 and 353,454 by 2025. (HRH strategic document)

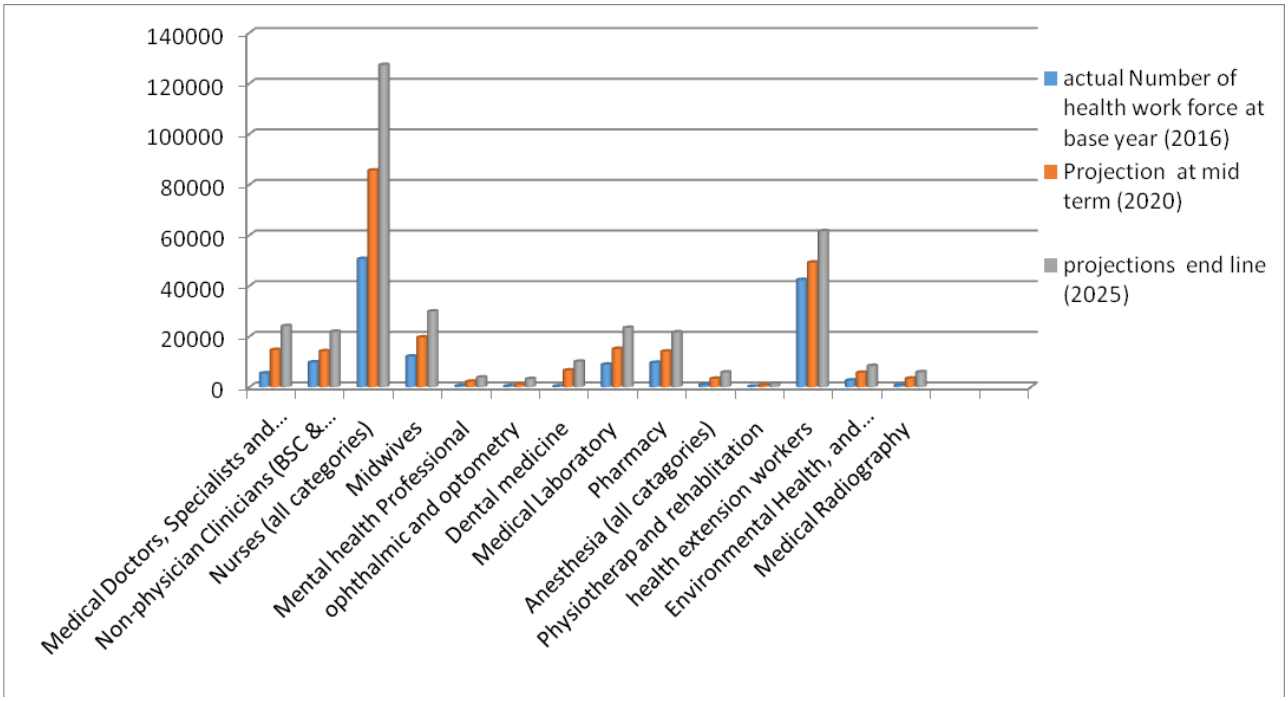


Figure 2: The existing workforce and projections for 2020 and 2025, (FMoH, 2017)

1.8.2. Health Policy Framework

In Ethiopia, the vision of HRH is to have an adequate number of well qualified, committed, compassionate, respectful and caring health workers contributing to the realization of the health sector's vision. Generally, the objectives of the Human Resource for Health policy are:

1. To strengthen the leadership and management of human resources for health;

2. To ensure availability and deployment of adequate number and mix of suitably qualified health workers at all levels of the health system;

3. To ensure the availability of a competent and motivated health workforce through improved training and supervision; and

4. To ensure efficiency, quality and acceptability of the health workforce through attention to equity issues.

1.9. Concepts of Professionalism and Compassionate, Respectful and Caring Service (CRC)

1.9.1. Healthcare Professionalism

Professionalism is a belief system in which group members (professionals) declare (profess) to each other and the public that shared competency, standards and ethical values they promise to uphold in their work and what the public and individual patients can and should expect from healthcare professionals.

At the heart of these ongoing declarations is a three-part promise to acquire, maintain and advance are:

- An ethical value system grounded in the conviction that the healthcare profession exists to serve patients' and the public's interests, and not merely the self-interests of practitioners;
- The knowledge and technical skills necessary for good healthcare practices; and
- The interpersonal skills necessary to work together with patients, obtain goals and values to direct the proper use of the profession's specialized knowledge and skills, sometimes referred to as the “art” of medicine.

Healthcare professionalism, therefore, pledges its members to a dynamic process of personal development, life-long-learning and professional formation, including participation in a social enterprise that continually seeks to express expertise and caring in its work.

Healthcare professionalism attributes are communication, empathy, integrity, compassion, responsibility, respect duty, altruism, self-regulation, ability to understand limitations and eager to improve the skills and knowledge. Healthcare professions rely upon delivering compassionate and respectful care that is essential to high-quality healthcare and that should be at the heart of the healthcare system.

1.9.2. Compassionate, Respectful and Caring (CRC)

CRC Definition

CRC means serving patients, being ethical, living the professional oath, and being a model for young professionals and students. It is a movement that requires champions who identify individual professionals with their profession and take pride in helping.

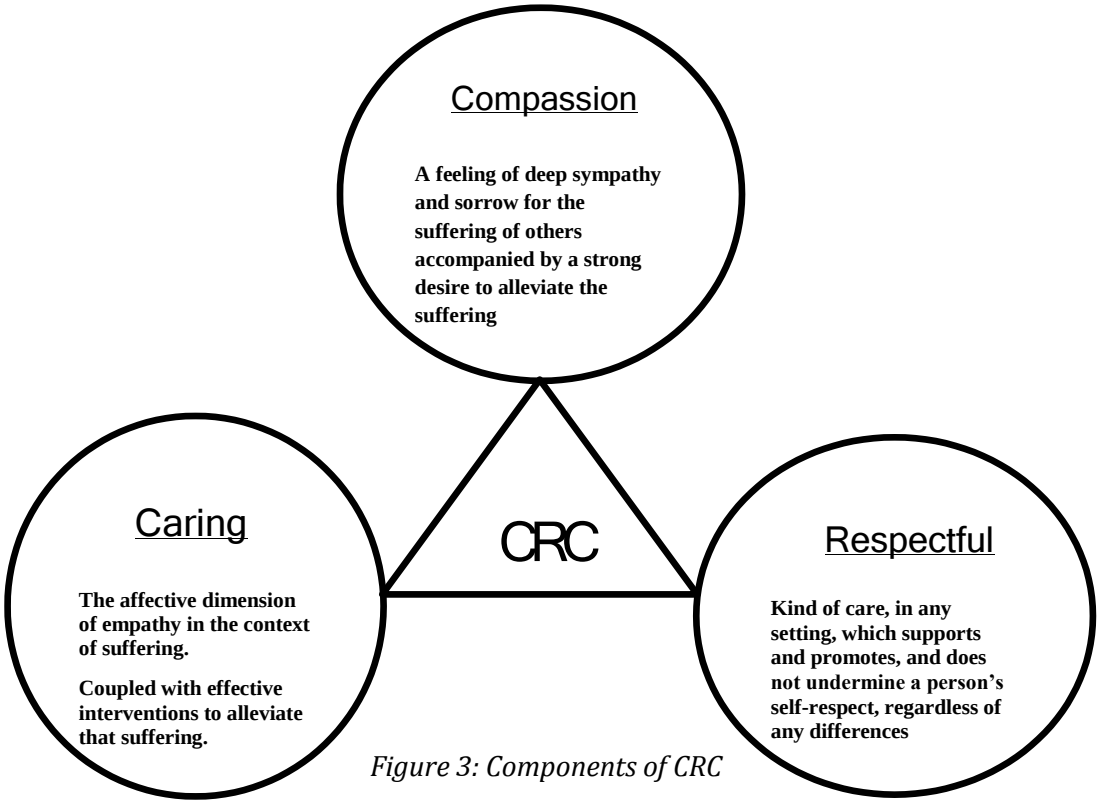


Figure 3: Components of CRC

Benefits of CRC

- **Patients Perspective**

  When health professionals are compassionate:

  - patients are less anxious

- patients accept medical advice
- Prevention and disease management are positively correlated.
- Hostile emotional states in patients that delay the healing processes are kept away

- **Health Professionals Perspective**

When health professionals are compassionate:

- They achieve earlier and more accurate diagnoses
- They get respect from their patients
- They find their work more meaningful and gratifying
- Their satisfaction in their relationships with patients can protect against professional stress, burnout, substance abuse and even suicide attempts

- **Students' Perspective**

When health professionals are compassionate:

- They become a good role model for their students
- Students' motivation to be CRC health professionals is increased

- **Health Care Facilities Perspective**

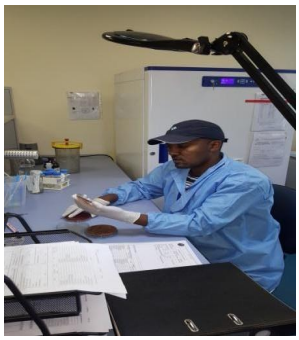
- Quality of health care and patient satisfaction will rise
- Lower malpractice suits
- Staff will be more loyal to their hospital or health care system
- Resources can be conserved
- Greater employee satisfaction and reduced employee turnover
- Flow of patients to the facility will increase

Generally, Compassionate and Respectful Care (CRC) is critical to building a sustainable, equitable and healthy future for all. A growing body of evidence has demonstrated that delivering CRC improves health outcomes, increases patient satisfaction, improves adherence to treatment and reduces malpractice claims and healthcare expenditures. Eventually, to be optimally effective in healthcare practice, every health professional without exception should be technically excellent and practice with compassionate care.

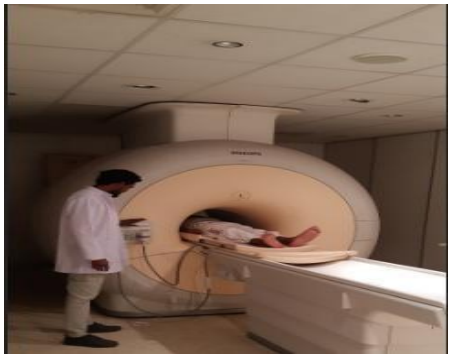
















PART TWO
PART TWO

2. Description of Health Profession

2.1. Anesthesia

2.1.1. Historical Background of Anesthesia

Anesthesia is a state of controlled, temporary loss of sensation or awareness that is induced for surgical purposes. It may include analgesia (relief from or prevention of pain), paralysis (muscle relaxation), amnesia (loss of memory), or unconsciousness.

Anesthesia is one of the fast-growing disciplines in medicine. It is a mixture of both science and art and unique in that it requires working with other specialties, including surgery, internal medicine, pediatrics, obstetrics as well as clinical pharmacology, applied physiology, and biomedical technology.

Before the introduction of Anesthesia with diethyl ether in Boston, Western surgeons attempted to relieve pain by hypnosis, ingestion of alcohol (wine, whiskey) and herbs. The successful scientific anesthesia was tested at Massachusetts's general hospital on October 16, 1846 G.C in front of an audience.



Picture 1: Historical establishment of Anesthesia

Anesthesia was one of the least developed disciplines in the history of medical practice in Ethiopia. Due primarily to that, foreign anesthetists coming from different countries of the world exclusively covered the anesthesia service in the country for quite a very long time.

Now, anesthesia has reached a stage in which it has become one of the most important disciplines in the health delivery system of the country.

The history of the effort to provide education and training in anesthesia in Ethiopia goes back to 1974 G.C. (1967 E.C. In that year, the World Health Organization (WHO) and the Ministry of Health agreed to open a school of Anesthesia for Nurses at Tikur Anbessa Hospital. In 1976 (1969), 18 nurse anesthetists graduated from the school after a formal training which lasted for two years. However, the school was soon closed due to political chaos that prevailed in the country at that time. Meanwhile, in September 1982 the existing School of Anesthesia for Nurses was founded and directed by Mr. Kessete Teweldebrhan (a nurse anesthetist).The Bachelor of Science (BSc) in Anesthesia training was started at Gondar University in 1995 E.C. Addis Ababa University also started BSC Anesthesia training 6 months later in the same year and Jimma University followed after one year.
Currently, 23 institutions in the country are providing the anesthesia program. At this time, nearly 2000 Level IV and BSC as well as around 400 MSc Anesthetists are working in public and private institutions.

2.1.2. Being an Anesthesia Professional

An anesthetist is a professional who keeps a patient comfortable, safe and pain-free during surgery by administering local or general anesthetic. Anesthetists should follow the Anesthesia processes which include preoperative, intra-operative and post-operative anesthesia care. Moreover, they also work out of the operation theater (trauma or surgical centers, plastic surgery clinics, dental clinics, intensive care units (ICU), post anesthesia care unit and Diagnostic procedures).. The job does not end until the patient has fully recovered from the effects of anesthesia.
The expected professional activities in Anesthesia process includes:

- Preoperatively an anesthetist will meet with the patient prior to surgery to make sure they are suitably prepared and medically fit to endure the proposed surgery as well as the related anesthetic.
- During the surgery (intra-operative), the anesthetist will monitor the patient's blood pressure, heart rhythm, temperature, level of consciousness, and amount of oxygen in the blood.

- Postoperatively, the anesthetist should follow and provide anesthesia care until the patient is fully awake.



Picture 2: The teacher is doing Anesthesia service with students for Pediatrics Case



Picture 3: Students are providing Anesthesia care service and monitoring patients.

2.1.3. Core Competencies

The core competencies of Anesthesia professionals are organized into six domains or thematic areas:

I. Social, epidemiologic and cultural context of Surgery and Anesthesia:

- Develops an epidemiological profile concerning the incidence, prevalence, morbidity and mortality of life-threatening conditions;
- Establishes priorities to the problems according to severity; and
- Creates anesthesia practice environment that reduces environmental risks.

II. Anesthesia Clinical Care Provision/ Anesthesia Professional

- Preparation and optimization of patients for theatre and patient safety;
- Care of anesthetic machine, monitoring, related equipment and drugs;
- Post-anesthesia care;
- Emergency and critical care; and
- Provision of Anesthesia for different and specific surgical procedures.

III. Interpersonal Relationship and Communication

- Establish discussion with patients' family and surgical care team for patient management;

- Uses skilled communication to foster true inter and intra-professional collaboration in the interest of continuity of patient care and professional development;
- Establishes and enforces channels of communication (written and verbal) within the facility structures; and
- Communicates effectively and timely within the surgical team in relation to consultation and referral of complex problems or deterioration in the patient's status.

IV. Organizational management and leadership

- Engages staff and the organization to incorporate performance improvement, quality and safety initiatives into practice;
- Ensures constant availability of adequate, operational, cost-effective, safe and efficient equipment and technology for the care of anesthesia clinical care;
- Ensures availability of back up airway, oxygenation and hemodynamic management;
- Designs evaluation strategies to demonstrate cost-effectiveness, cost-benefit and efficiency (fitness for purpose) factors associated with anesthesia clinical care practice; and
- Considers fiscal and budgetary implications in decision making related to practice and practice modifications.

V. Research, Educational and Professional Development

- Actively engage in research;
- Use of evidence in anesthesia clinical practice and quality improvement;
- Engages in self-evaluation of one's own practice on a regular basis;
- Identifying areas of strength as well as areas in which professional growth would be beneficial; and
- Obtains formal and informal feedback regarding one's own practice from health care users, peers, professional colleagues and others.

VI. Professional, Legal and Ethical Practice

- Demonstrate a commitment to carry out anesthesia professional responsibilities and adherence to ethical principles;

- Accepts accountability for increased responsibility for one's own professional and clinical judgment, actions, anesthesia clinical care outcomes and continued competence in accordance with the prescribed scope of practice; and
- Demonstrate anesthesia professionals' code of conduct.

2.1.4. Professional Career

Anesthetists in Ethiopia have four to five years of duration of training for an undergraduate college degree. There are different Level of Anesthetists with horizontal and vertical professional career development. These are:

- **Anesthesia Professional:** is a practitioner who has successfully completed the prescribed course of a baccalaureate degree.
- **Anesthesia Specialist:** is a practitioner who has successfully completed MSc edu

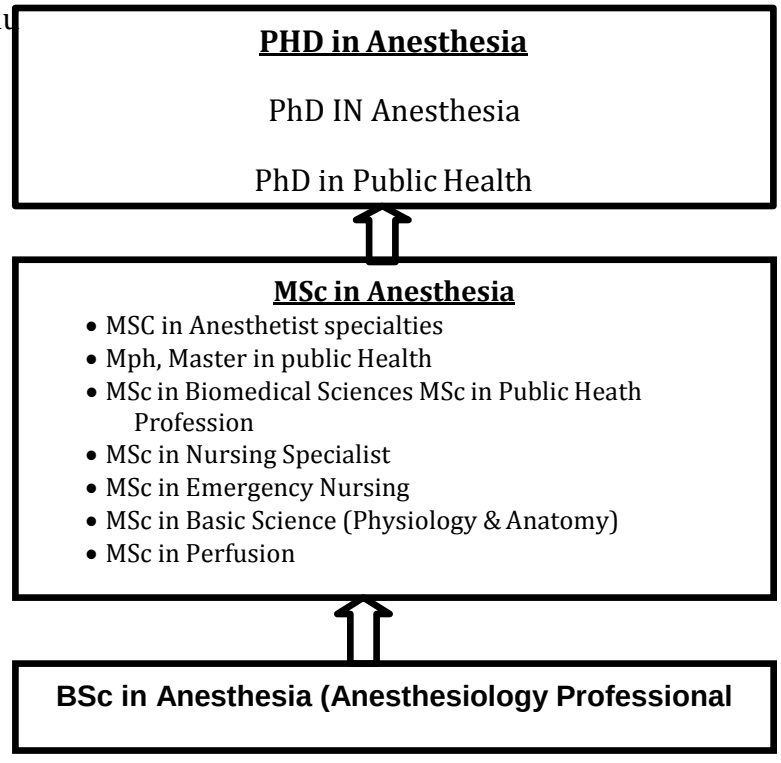


Figure 4: *professional career development of Anesthetists*

2.1.5. Opportunities and Challenges of Anesthesia Profession

A. Opportunities

Opportunities in anesthesia profession include:

- Having multidisciplinary knowledge from the feature of the profession.
- High market demand on the profession, both in government and private hospitals.
- Instant gratification and feedback in the operating room
- The BSC training is given in 23 Universities and colleges in all corners of the country
- The profession requires critical thinking and problem-solving skills which can stimulate the Anesthetist to update their knowledge.
- There is an opportunity to become a member of the health professionals association.
- Career development (To MSc in Anesthesia and PhD in Anesthesia),
- Anesthetists in academy are both instructors and anesthesia practitioners.

B. Challenges

The challenges in anesthesia profession include:

- Physical and psychological stress
- Requires the ability to stand for extended time
- High-risk endeavor of life
- Work overload
- Poor health facility (continuing drug shortages and equipment)
- Utilizing a variety of often poorly maintained donated pieces of equipment, contributes to unacceptably high morbidity and mortality rates.
- Poor awareness among the society about the profession
- Debate over the scope of practice and as the result role conflict with other health professions

2.1.6. Things to consider before choosing Anesthesia Profession as your career

- Do I understand clearly what is required and expected from an anesthetist?

- Do I have interest to help patients and families?
- Do I understand the challenges of anesthesia profession?
- Am I attracted by the opportunities of becoming Anesthetists?
- Do I feel comfortable to take responsibility about patient?
- Do I have an interest to listen respectfully to the opinions of patients and family members?
- Do I have the interest to join this profession?

2.2. Biomedical Engineering

2.2.1. History and Development of Biomedical Engineering

The evolution of biomedical engineering has a long history. The German archeologists discovered a 3000 years old mummy from Thebes with a wooden prosthetic tied to its foot to serve as a big toe in 2000 G.C. In 1816 G.C, French physician Rene Laennec invented stethoscope and DuBois Reymond landmarked the developments in electrophysiology in 1848 which were the roots of biomedical engineering for an academic endeavor.

The inventions and innovations in x-ray imaging (1895), electrocardiogram (1903), electron microscope, heart lung machine artificial tissue replacements and mechanical respirator have brought significant change in the development of biomedical engineering. The recent discoveries in magnetic resonance imaging (2003) and inventions in charge-coupled devices (2009) in medical imaging are great successes of biomedical engineering in healthcare delivery.

The earliest academic programs in biomedical engineering began to take shape in the 1950s. The development of biomedical engineering as an academic training was established after discussions held between Johns Hopkins University, the University of Pennsylvania, the University of Rochester, and the Drexel University who were among the first to win important training grants for biomedical engineering from the National Institutes of Health, USA. Today, Biomedical Engineering programs are present at a large number of universities all over the world with an increasing trend.

In case of Ethiopia, biomedical engineering was started at Jimma University by enrolling 23 undergraduate students in 2008 G.C with the curriculum of five years training duration. Then, the enrolling number of students increased and this university began master program in 2016. Addis Ababa University took the next step by beginning Biomedical Engineering program at undergraduate and graduate (MSc) levels in 2012 and PhD in 2019. Gondar and Hawassa Universities have started undergraduate program in biomedical engineering since 2016. Currently, there are more than 700 hundred BSc holder biomedical engineers, more than 50 MSc holder engineers and more than 10 PhD holders in Biomedical Engineering.

2.2.2. Being a Biomedical Engineer

According to WHO, Biomedical Engineering is a bridge between health science and engineering which is "integrates physical, mathematical and life sciences with engineering principles for the study of biology, medicine and health systems and for the application of technology to improve health and quality of life". The field is rapidly expanding to include many exciting research areas:

Such as:

- Creating knowledge and mathematical modeling, analysis, design – to living systems from molecular to organ systems levels;
- Creating synthetic materials intended to interact with living systems;
- Designing devices, systems, information approaches and technology management for the prevention, diagnosis and treatment of diseases;
- Analyzing the mechanics of living organisms for patient care and rehabilitation;
- Creating images of the body using light, sound, radiation, electrodes, etc;
- Designing surgical robots and artificial organs for improving the patient way of life;
- Conducting researches to design and develop systems for safety and effectiveness of medical devices/systems and training for safe use of medical devices in the health-care organizations; and
- Innovating, designing, developing, regulating, managing, assessing, installing, and maintaining healthcare technologies for their safe and cost effective use throughout their life cycle.

2.2.3. Core Competencies in Biomedical Engineering

Biomedical engineers work by integrating engineering and medicine, and that is often responsible for the creation of lifesaving medicine and technology. Biomedical engineers devote their valuable time to research and development, where they work to expand the boundaries of medicine by leveraging their engineering skills and expertise. Biomedical engineers may spend their career in universities, manufacturing facilities, research labs, private companies, medical institutions, or other government agencies. Due to the complexity and demanding nature of the work, interested individuals in biomedical engineering should possess certain knowledge, skills and attitudes before beginning to work in the field.

The core competencies of biomedical engineers regarding knowledge, skills and attitude are: -

- **Communication**–Biomedical engineers are expected to acquire empathic communication skills and techniques for effective interpersonal relationships with people and other professionals in health care settings.
- **Teamwork-**they must have abilities to work in collaboration with multidisciplinary professionals and colleagues towards the improvement of healthcare technology.
- **Analytical skills-**they must analyze the needs of patients and customers to design appropriate solutions.
- **Creativity-**they must be creative to come up with innovative and integrative advances in healthcare equipment and devices.
- **Knowledge in Math's and science-**they use the principles of calculus and other advanced topics in math and statistics, for analysis, designing, and troubleshooting purpose.
- **Problem solving skills**-Biomedical engineers deal with complex biological systems and combine several pieces of information to solve problems.
- **Manager**-work as a team leader, change agent, planner and mentor for the wellbeing of clients, independence and safety through efficient use of scarce resources and instituting a continuous performance improvement process.

- **Counselor**-help a client to select appropriate technology, proper procedures and systems for healthcare technology.
- **Teaching/training-**committed to teaching, training, supervising and assessing students and health professionals, to develop the workforce in healthcare technology.
- **Research and Development**- Biomedical engineers' bring engineering and multidiscipline sciences together to ensure the end result of their collective work is a product that is safe, effective and performs as intended for the benefit of the patient.

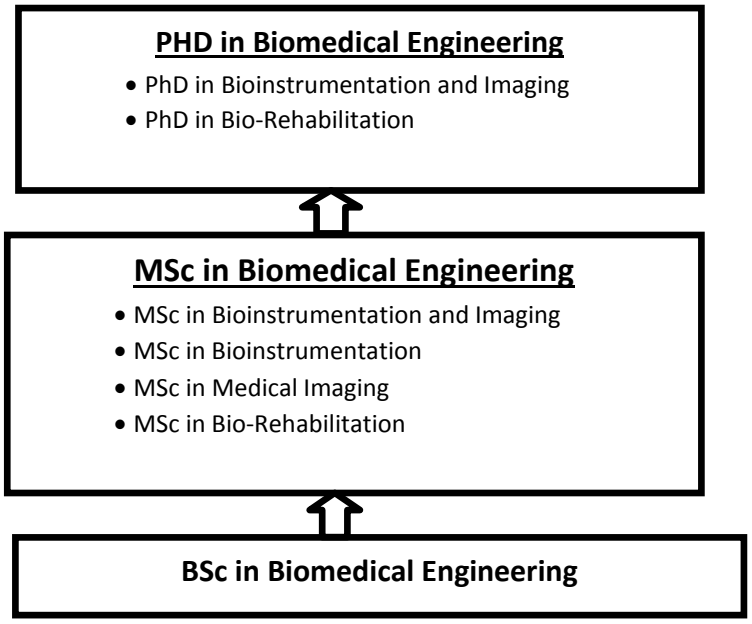


Figure 5: Biomedical Engineering Professional Career Path

2.2.4. Professional Career

Biomedical Engineering professionals can develop their professional carrier to either horizontal or vertical careers with regard to education through attending various programs both in the country Ethiopia and abroad. The following figure shows current biomedical engineering professional career path in our country

2.2.5. Opportunities and Challenges of being Biomedical Engineer

A. Opportunities

- It is a lifesaving field.
- There is a great demand for highly skilled Biomedical Engineers nationally and globally.
- Biomedical Engineering is internationally accepted profession and hence Engineers can work in any country in the world.
- Biomedical engineers work with multidisciplinary health professionals for prevention, diagnosis and treatment of disease collaboratively.
- There is an increasing need in managing medical devices and maintenance services (preventive, calibration, corrective) where biomedical engineers work
- Opportunities of being supplier of medical devices
- Professional development career up to PhD level is available in the country.
- There is an increasing demand in innovation of healthcare technologies
- Employment opportunities are available in every healthcare systems, national regulatory agencies, government institutions, research and development industries and academic institutions
- Biomedical engineers work on design, installation and operation monitoring of advance medical devices.

B. Challenges

Despite of being recognized, there are so many difficulties and challenges facing young biomedical Engineers in their profession. Some of the major challenges that Biomedical Engineers are facing today include:

- Working with ever growing new and sophisticated medical devices and healthcare technologies require high skills
- Lack of awareness about the profession in health facilities
- Role conflicts with other professionals in supply and commissioning of medical devices

- Being exposed to risks and hazards like radiation hazard, mechanical damage, chemical/bio-hazard, electrical and fire hazards while working on medical devices.
- Challenges in procurement and supply of quality medical devices including their standard accessories, spare parts and documents and
- Working in the unsuitable and not well equipped workshops in hospitals

2.2.6. Thing to be considered before Choosing Biomedical Engineering Profession

- Commitment to integrate science and engineering that requires long hours study
- Being able to update knowledge and skills on ever growing healthcare technologies
- Courage to share knowledge and skills to colleagues, clients and students
- Respecting personal values and having compassionate nature
- Prioritizing safety and quality while working on healthcare technologies
- Respecting for coworkers and colleagues
- Abide with ethical issues
- Practice in line with the scope of biomedical engineering practices
- Practice within the required level of competence
- Engagement in professional development
- Commitment to design and innovate technologies or approaches for healthcare delivery
- Being able to work in challenging work environment

2.3. Environmental Health

2.3.1. Historical Background of Environmental Health

Since prehistoric times, human beings have been accustomed to follow certain sanitary practices. There is ample evidence that the people who lived in caves used to clean their shelters and dispose of their waste. Relics of old water supplies and sewerage systems that have been uncovered in ancient Babylonia, Egypt, Athens and Rome are testaments of the role of sanitation in the golden ages of these regions. Environmental health program (EHP) being perfected today started during the industrial revolution of the 18th and 19th centuries following the mass migration of people from rural areas to the cities in search of jobs. Living conditions then became poor and outbreak of several communicable diseases with high morbidity and mortality became rampant.

The History of Environmental Health Service in Ethiopia dates back to the year 1908 when the first environmental health unit was opened in the Ministry of Interior. In the decades of 1908 to 1948, the service remained stagnant due to lack of trained human power in the field and the low attention accorded to it. In 1948, a full-fledged Ministry of Health was founded and along with this establishment, the National Health Service and Environmental Health programs were established as one of the wings of the ministry.

Organized sanitary science training in Ethiopia traced back to around 1942, in aftermath of the victory of the Italian invasion in 1941. Available records indicated that there were no Ethiopian personnel trained in the field of environmental sanitation during that time, hence, the Ethiopian appointed a Sudanese health inspector to handle matters pertaining to environmental sanitation. In 1946, the United Nations Relief and Rehabilitation Administration (UNRRA) initiated the first organized training of sanitary personnel in Ethiopia.

A breakthrough in the training of Environmental Health in Ethiopia was made in 1954, when Gondar University, in the then Hailesilassie I Public Health College and Training

Center, started to train sanitarians and other health workers. The malaria epidemic, which claims the lives of many in Dembia district at the time, was one of the reasons for the opening of the training center. From 1956 up to 1988, Gondar was the only school for the training of sanitarians in the country. However, in 1988, another environmental health school was opened at diploma level in Jimma. Afterwards; other universities have started to provide training at BSc and higher level.

2.3.2. Being Environmental Health Professional

Environmental health professionals may be known as ''Environmental Health Officers, Public Health Inspectors, Environmental Health Specialists, or Environmental Health Practitioners. Environmental Health Officer is a health professional who involves in preventing and controlling diseases, injury, and disability related to interaction of humans and their environments by studying the natural and manmade factors that contribute to health of community and environment.

As a branch of public health, Environmental Health deals with all aspects of the natural and built environment affecting human health. Environmental health is focused on the natural and built environments for the benefit of human health. The discipline can be illustrated by the framing concept below;

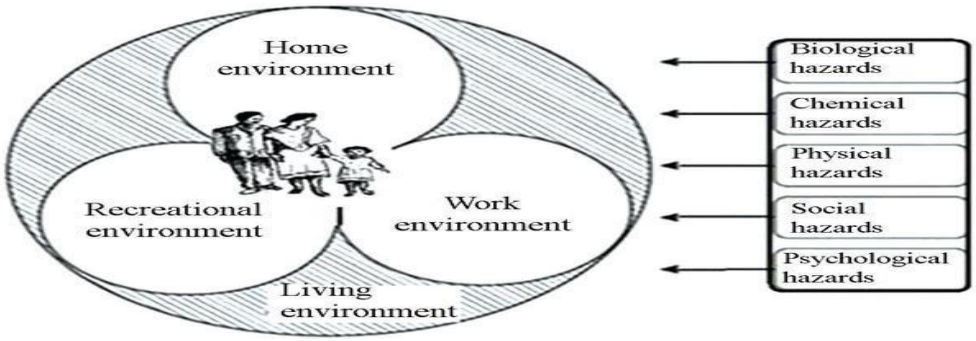


Figure 6: The system of environmental health

In Ethiopia, Environmental health practitioners must have a graduate degree in environmental health and be certified and registered under the regional health bureau.



Picture 4: Environment health professional at work place

2.3.3. Core Competencies of Environmental Health Professional

The main core competencies of Environmental health Practitioners in the public and private sectors are presented as follow.

I. As Supervisor/ Public Health Inspector

- Carry out routine or unplanned visits and inspections to ensure compliance with health and safety legislation and take action to improve conditions;
- Investigate complaints about environmental issues from the general public;
- Carry out food hygiene, water, sanitation and hygiene (WASH)and food standard s inspections;
- Investigate outbreaks of infectious diseases and prevent them from spreading
- Monitor levels of noise, air, and land and water pollution.
- Enforce Laws and Regulations that Protect Health and Ensure Safety
- Conduct water quality monitoring and surveillance

II. As Environmental/Public Health Manager

- Anticipate, recognize, evaluate and control/prevent workplace hazards, accidents, injuries and diseases;
- Play a major role in ecological conservation, rehabilitation and protection of environmental pollutions;
- Develop strategies, policy briefs and programs to address specific public health concerns with due consideration of scientific, socio-cultural, fiscal, political, ethical and legal implications; and

- Play a great role in designing, implementing and managing water sanitation and Hygiene projects,
- Take enforcement action, initiate legal proceedings, prepare and give evidence i n court in violation of environmental and occupational health standards and leg islation.
- Monitor environmental and health status to identify and solve community
- Environmental health problems;
- Diagnose and solve environmental health problems in the community
- Link people to needed environmental health services and ensure the provision of Environmental Health services when otherwise unavailable

III. As a Researcher

- Collect, store, retrieve and use accurate and appropriate environmental and occ upational health data and information on public health issues;
- Perform risk assessment associated with components of the physical, chemical, radiological and biological environment and identify populations at elevated ris k;
- Involve in research, policy dialogue, and up-to-date scientific knowledge in both national and international context to better understand the real problems of the community;
- Investigate an outbreak or public health emergency and set prevention and pro motion strategies; and
- Develop and set environmental and occupational health standards and limits.
- Research for new insights and innovative solutions to environmental health pro blems and issues
- Develop policies and plans that support individual and community environment al health efforts
- Ensure competent environmental health workforce

IV. As Environmental and Occupational Health Consultant

- Consult on environmental/ occupational health and safety policy development a nd planning issues at the national and regional levels;
- Consult on environmental quality (water, air, food, soil, chemicals, reagents, cos metics, etc) control;
- Act independently to provide advice on environmental health matters, design a nd develop plans of action for environmental health.
- Evaluate the effectiveness, accessibility, and quality of personal and population based EH Services

V. Environmental Health Promoter

- Discuss the public health implications of contemporary issues such as technolog y, urbanization, development, globalization, climate change, trade, bioterrorism, displacement and migration, substance abuse and alcoholism;
- Articulate basic concepts of Environmental Health and public health and convey an understanding of their value and importance to client and public;
- Assess the effect of climate change on the public and recommend climate chang e adaptation mechanisms;
- Anticipate, recognize, evaluate and control/prevent workplace hazards, acciden t, injury and disease/ill and promote prevention and coping mechanism
- Inform, educate, and empower People and Communities about Environmental H ealth issues
- Mobilize community partnerships to identify and solve Environmental Health p roblems
- Main promoter of Water, sanitation and hygiene (WASH)

2.3.4. Professional Career (Both vertical and horizontal)

Generally, Environmental Health professional career is diversified.



Figure 7: Horizontal and vertical professional career development of Environmental Health Profession

2.3.5. Opportunities and Challenges of Environmental Health Professional

A. Opportunity

Opportunities in Environmental Health Professional include:

- The environmental health activities are the main national and international agenda that enables to exercise their profession effectively;
- High employability opportunity ranging from health sector to other non-health sectors;
- Multiple options to develop their career with in the country and abroad;
- Presence of national and regional environmental professional association;

- Ability to work as private consultant in field of Environmental and Occupational Health.
- Sector interest in the profession, MoH, MoWIE, FDA, Environment, Forest and climate change Commission

A. Challenges

Challenge in Environmental Health Professional includes:

- Poor awareness about the profession among the society;
- Limited laboratory facilities in universities to practice profession appropriately;
- Require more field works to serve the community including at the household level;
- Despite the importance of environmental health work in protecting the public's health, this work often falls under the radar of public awareness. It's still not well-understood by the public.
- Misunderstanding and unknowingly mixing of environmental professionals work bases with others.

2.3.6. Things to consider before choosing environmental health profession as your career

- Have a good communication skill
- Have a good inclination and interest towards mathematics, drawings, engineering and logical reasoning
- Cope up frequent fieldwork
- Have a good team spirit
- Have a commitment /passion to establish clean and safe environment
- Ability to involvement with community

2.4. Health Education and Promotion

2.4.1. Historical Background of Health Education and Promotion

Health education first took place during pre-historic era. Someone may have eaten a particular plant or herb and become ill. That person would then warn (educate) others against eating the same substance.

At the beginning of the 20 thcentury, official formulation of health education policy has been started in most of the world. The development of health education and promotion has been accelerated with the initiation of primer health care (PHC) concepts, at the fine of declamation of Alma Ata declaration of Primary Health Care in 1978. At this point in time health education and promotion was reorganized as a fundamental tool for the attainment of Health for all and was put as one of the eight (8) components of PHC.

The development of health education is related to the initiation of health promoting activities for school children and their environment including nutrition education.

In Ethiopia Health education and promotion activities was initiated and started after the initiation and declaration of primary health care. In 2004 health education and promotion department was officially opened at Jimma University in BSC program as one of public health professionals. Since then a lot of students were joined health education and promotion professionals. Currently Master of public health in health education and promotion and PhD in Health communication and behaviour change are provided by Jimma University.

2.4.2. Being Health Education and Promotion Professionals

According to Almata declaration of PHC Health education defined as a process aimed at encouraging people to want to be healthy, to know how to stay healthy to do what they can individually and collectively to maintain health and to seek health when needed. Beside Griffiths (1972), described health education and promotion service as an attempt to close the gap between what is known about optimum health practice and what is actually practiced.

Health education as aimed at bringing about behavioural changes in individuals, groups and larger populations from behaviours that are presumed to be detrimental to health, to behaviours that are conducive to present and future health. Being Health education and promotion requires commitments to work for the combination of learning experiences designed to facilitate voluntary actions conducive to health.

The practices of Health Education and promotion professionals include:

- Designing and development of health communication and promotion strategies
- Preparation of health communication materials based on selecting and identifying targets
- Development of social and behaviour change communication intervention and evaluation of the interventions
- Preparation of health fact sheets and conduct advocacy based on the fact sheets
- Conducting research on social and behaviour change communication interventions
- Promotion of health and wellbeing for people and their families, colleagues, the broader community and themselves and in a way that addresses health inequality.
- science and art of preventing disease, prolonging life and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals.
- Applying behaviour change communication models for suitable behaviour change in health and well beings
- Reaching the intended audience for health communication and behaviour change interventions

2.4.3. Core Competencies in Health Education and Promotion

- **Effective Behaviour Change communicator**: Health education and promotion professionals design and produce health commutation and behaviour change messages in accuracy, free of errors and valid manners.
- **Advocators:** a person who advocates a process of engagement of series political actions conducted by organized citizens in order to transform power relationships.

The purpose of advocacy is to achieve specific policy changes that benefit the population involved in this process. These changes can take place in the public or private sector. Effective advocacy is conducted according to a strategic plan and within a reasonable time frame.

- **Social Mobilizes:** process of enabling men, women and children to increase their ability to determine their present and future as an act of choice.
- **Managers:** Health education and promotion professionals work as strong advocator and leaders in health care systems.
- **Researcher:** Health education and promotion professionals recognize the importance of evidence generation and research to communicate audiences and to advocate policy makers and policy and decision-making of people who participate in research. They also actively engage in scientific research endeavours, interpretation and application of evidences in social and behaviour change communication interventions

2.4.4. Professional Career

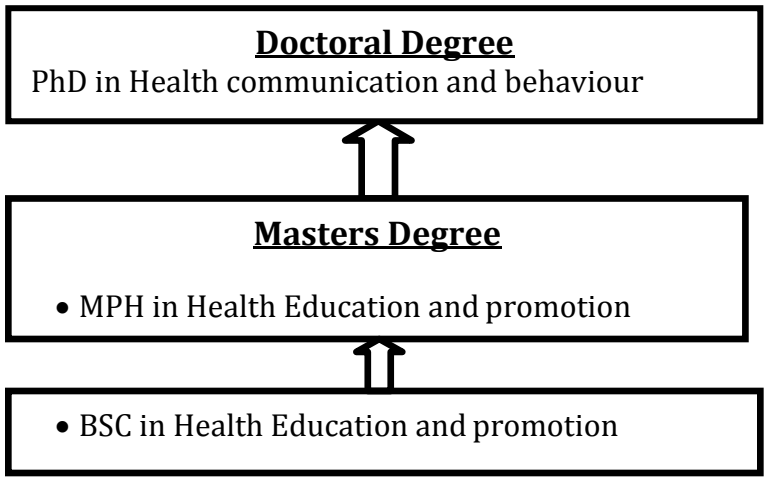


Figure 8: Health education and promotion professional career

2.4.5. Opportunities and Challenges of Health Education and Promotion Professional

A. Opportunities

- Will have global profession and easy to have international networks through health education and promotion networks
- There is high demand from organization, research institutions and international organizations.
- The current health sector policy focuses mainly on preventive strategy. To achieve this objective, health education and promotion is the priority profession.

B. Challenges

- Health Education and Promotion is not well known by organizations and institutions
- Lack of understanding on the major principles of Health Education and Promotion professionals
- Health education and promotion profession needs comprehensive enough skills in communication, science and art
- Change on human Behavior will take long time and the investments and efforts are not easily measured.
- It is easier to sell symptomatic relief of illness or cure than to sell health and prevention of disease
- Changing health behavior is conditioned by factors such as social, psychological, economic, cultural, accessibility and quality of services, political environment, etc. which are difficult to deal with simultaneously
- People are preoccupied with many daily activities to support their life which impedes them to give their ear to the messages of health education.
- Health education does not have high prestige and focus from the governments
- Health education is much more than "transfer of information." Without changes in attitudes and actions it remains a useless exercise.

2.4.6. Things to be considered before Choosing Health Education and promotion Profession

- Am I having commitment to study long hours?
- Am I having good communication skill?
- Am I having commitment to work if assigned in remote rural areas?
- Can I share my Health Education and promotion knowledge with patients, colleagues, students and others?
- Can I encourage clients/staff/students to ask questions and raise concerns?
- Can I respond to client/staff/student concerns appropriately?
- Am I respecting personal values and having compassionate nature?
- Can I assist clients to make informed choices?
- Can I protect the privacy and confidentiality of client information?
- Can I show respects for the professional knowledge and skills of colleagues?
- Can I identify ethical issues and take action to resolve them?
- Can I maintain my own physical, psychological and emotional fitness to practice Health Education and promotion?
- Can I manage personal stress effectively in the workplace?
- Can I engage in professional development?

2.5. Medical Laboratory Sciences and Technology

2.5.1. Historical background of Medical Laboratory Sciences and Technology

The first proper full-fledged modern clinical laboratory was opened in at Johns Hopkins Hospital in Baltimore in 1896 for the assessment of human body fluids. At that time, the importance of laboratory examination in diagnostics and therapeutics was not recognized. The early 1920s marked the emergence of the field of clinical laboratory science as a distinct profession. With advancement in clinical laboratory science, the skills and knowledge required by laboratory workers became more clearly defined in order for them to competently exercise their duties.

In the 1950s, technological advances laid the foundation for advancement in instrumentation, automation, quality control, and quality assurance. These advancements not only enhanced the precision and accuracy of results but also provided more efficient analytical processes. The demand for clinical laboratory staff paved the path to establishing training institutes with numerous programs for laboratory technicians all over the world.

In Ethiopia, Medical Laboratory services began earlier in few places including Menillik II Hospital which was established in 1906E.C, The American missionary hospital by Dr. Thomas Lambie at the current site of EPHI was established in 1922E.C. When the Italian army invaded Ethiopia in 1928E.C, Lambie hospital was confiscated by the Italian fascists and the name was changed to **"Ministro Dela Sanita".**

In 1944E.C, the Ethiopian Imperial Government concluded a bilateral agreement with the Institute of Pasteur d' Paris whereby the Institute was renamed "Institute Pasteur d'Ethiopie". At that time, the laboratory service and vaccine production departments were established and made functional including Bacteriology, Parasitology, Hematology and Serology, and Chemical analysis, Preparation of antivariolic vaccine, antityphus and antitypho-paratyphoidal vaccines, B.C.G vaccine, and antirabies vaccine.

The first medical laboratory school was established at Menelik II Hospital undertaking training of medical laboratory technicians in 1956 and followed by Gondar Health Team Training that has trained 1473 laboratory technicians from 1958 to 1973. 1958 to 1973.

2.5.2. Being Medical Laboratory Sciences and Technology

Medical laboratory science professionals, often called medical laboratories, are vital healthcare detectives, uncovering and providing laboratory information from laboratory analyses that assist physicians in patient diagnosis and treatment, as well as in disease monitoring or prevention (maintenance of health). They use sophisticated biomedical instrumentation and technology, computers, and methods requiring manual dexterity to perform laboratory testing on blood and body fluids.

These professionals do everything from providing cancer testing results to predicting the correct antibiotic to prescribe, to typing the correct blood for surgery. MLS professionals provide answers to life-and-death decisions every day. Laboratory science is a critical healthcare field that impacts the health of every individual.



Picture 5: Medical laboratory sciences and techno list at work place

2.5.3. Core competency of Laboratory Sciences and Technology Profession

I. Laboratory competency

- Perform routine and advanced chemical, biological, hematological, immunologic, microscopic, and molecular tests, on clinical, environmental, drugs, toxins and specimens of public importance;
- Collect, preserve, store and transport referral specimens for proper and safe testing;
- Recognize and interpret laboratory findings and correlate with common disease pathogenesis;

- Confirm and verify results through in-depth knowledge of scientific methods, principles and instrumentation theory.

II. Research Competency

- Participate and contribute to surveillance and control of communicable disease and information dissemination in diseases outbreak situations;
- Assist, participate and conduct operational and basic research and involve in development of new medical laboratory diagnostic technologies; and
- Recognize ways of surveillance of communicable diseases.

III. Leadership Competency

- Supervise medical/clinical laboratory technicians;
- Develop, evaluate and update laboratory standard operational procedures;
- Demonstrate leadership and management skills in health/research institutions;
- Engage in policy, professional standards, and continuing professional development issues pertaining to medical laboratory profession;
- Identify factors that affect procedures and test results, and suggest appropriate action within predetermined limits; and Recognize laboratory logistics procurement, evaluation, setup specification and equipment auditing.

IV. Professionalism Competency

- Communicate effectively both verbally and in writing;
- Maintain the medical laboratory ethical code of conduct standards and contribute to stewardship of their profession;
- Participate in policy, professional standards, continuing professional development issues pertaining to medical laboratory profession; and
- Respectful and compassionate to patients, their relatives and other professionals.

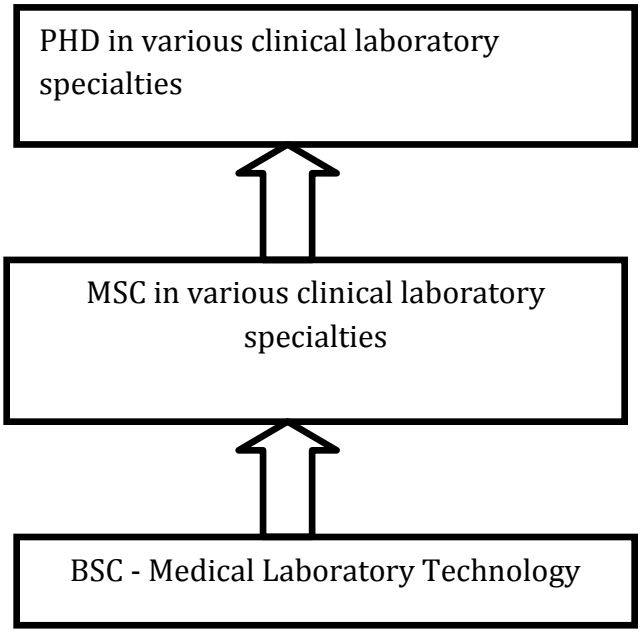
V. Quality Assurance and Safety Competency

- Plan and monitor laboratory logistic procurement, evaluation, setup, auditing and safe disposal;
- Establish and monitor programs to ensure the accuracy of tests;

- Provide professional services, play leadership role and assure quality in clinical/public health laboratories;
- Monitor and maintain proper functioning of medical laboratory equipment/reagents;
- Collect, document, retrieve and interpret laboratory data clearly and safely; and
- Recognize and adhere, institute and promote safety, quality control and quality assurance in clinical and public health laboratories.

2.5.4. Professional Career of Laboratory Sciences and Technology Profession

Careers in laboratory science are perfect if you are analytical, enjoy problem-solving, and are interested in the science of healthcare. Whether working as a medical laboratory professional, cytotechnologist, or histotechnologist, there are a variety of opportunities requiring different levels of education and training.



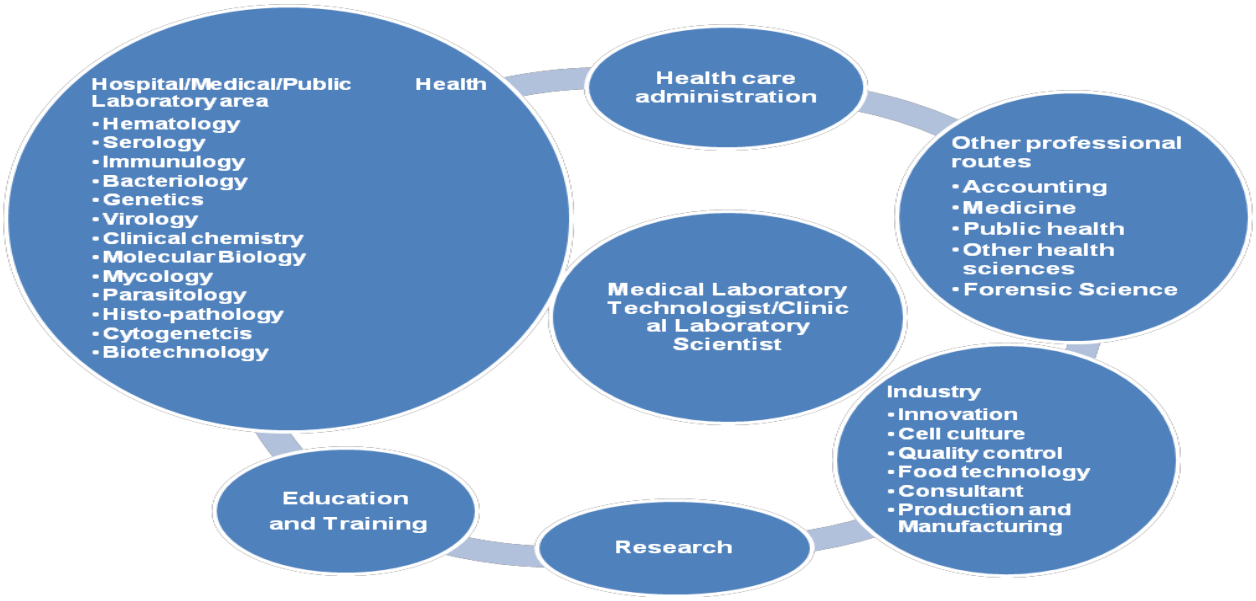


Figure 9: Professional career development of medical laboratory profession

2.5.5. Opportunities and Challenges of Laboratory Sciences and Technology Profession

A. Opportunities

Opportunity in Laboratory Sciences and Technology Profession Professional includes:

- Expansion of research institutions
- The demand of the department to engage in research activities
- Advancements in the field that include PhD programs in different disciplines
- Existence of well-trained laboratory personals to obtain well established experience.
- Government commitment to the development of the field
- Interests of the foreign universities/academic institutions to collaborate for prevention, control and eradication of diseases
- Improved productivity of clinical laboratories
- Increased innovations throughout the world

B. Challenges

Challenges in Laboratory Sciences and Technology Professionals include:

- Advancements in technology that require huge financial resources and skills
- Limited resources hindering the utilization of sophisticated machines
- Absence of biological and/or chemical hazard risk payments
- Absence of many test techniques at health centers and hospitals that compromises cooperative training
- Increased laboratory costs
- Shortage of equipment and supplies
- Poor maintenance systems of machines/equipment
- Risk of acquiring infections e.g. tuberculosis
- Lack of personal self-protective devises

2.5.6. Things to consider before choosing Medical Laboratory Science for your career

- Does my background (high school level study with subjects like Chemistry, Biology, English and Mathematics) go in line with the course information stated?
- Does it fit into my career interest?
- Do I understand descriptions of this program clearly?
- Am I responsible and highly careful?
- Are the core competencies interesting?
- Do I have critical thinking ability to fit into the program requirements?
- Do I have the discipline that this program requires? (curios responsibility)
- Can I work independently?
- Can I maintain appropriate work environment?
- Am I caring, respectful and passionate?
- Can I manage my time to efficiently work when I graduate?
- Am I interested to become a research practitioner?

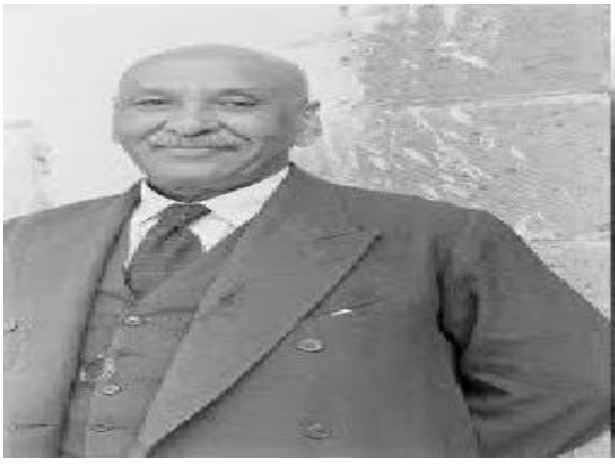
2.6. Medicine

2.6.1. Historical Background of Medicine in Ethiopia

Early medical traditions include those of Babylon, China, Egypt and India. The Hippocratic Oath was written in ancient Greece in the 5th century BC, and is a direct inspiration for oaths of office that physicians swear upon entry into the profession today. After 1500 AD medicine began to emerge as a true science which was for long under the eclipse of superstition and speculation.

The period as of the 17 th century is full of exciting discoveries. such as invention of microscope by Leeuwenhoek (1670), identification of germs as cause of disease by Louis Pasteur (1857), discovery of X-rays by Wilhelm Conrad Roentgen (1895), development of the first cardiac pacemaker by Paul Zoll (1952), the first kidney transplant by Dr. Joseph E. Murray (1954), the first human heart transplant by Dr. Christian Bernard (1967), invention of the artificial kidney dialysis machine by Willem J. Kolff (1985), …etc.

1896 is considered as the beginning of modern medicine in Ethiopia when the first hospital was opened by the Russian Red Cross Mission. Hakim Workneh Eshete (1864 – 1952) was the first Ethiopian medical doctor, who had his medical training in India and Scotland and graduated in 1891. Dr. Melaku Beyan (1900-1940) was the second Ethiopian medical doctor who graduated in 1935 from Howard Medical School, USA.



Picture 6: Hakim Workneh Eshete



Picture 7: Dr. Melaku Beyan

Addis Ababa University Medical School is the first medical faculty in Ethiopia which was opened in 1964, followed by Gondar Medical School in 1977 and Jimma Medical School in 1984. The first Ethiopian doctors were graduated in 1968.

Following the endorsement of new health policy in 1993, a dramatic improvement was marked in medicine nationwide. Currently, there are 37 medical schools in the country; (30 public and 7 private) where medical doctors are being trained. Out of the existing 30 public medical schools, 13 have started providing specialty training and around 5-sub specialty trainings. The medical student enrollment in medical school and number of graduating physicians is tremendously increasing from time to time, and it's estimated that more than 9000 doctors (GPs, specialists and subspecialists) are currently working in the country.

2.6.2. Being a Medical Doctor

Start by asking yourself what matters most to you in a career. If you are motivated by a sense of purpose, desire to make a difference and the deeply gratifying feeling of saving lives, then becoming a doctor may be your calling. A medical profession, particularly being a medical doctor, is not just a profession. It is beyond that; it is a CALL to help those who require medical assistance.

Being a medical doctor means being a part of this noble profession of medicine. It is a source of genuine respect from the community. The word physician has nothing to do with the word physics. A **physician** means just in other words a **medical doctor**.

Medical doctors (MDs) or physicians are those who thoroughly enjoy helping others; they are the one who strive their whole life to stick to the sacred oath (Hippocratic oath) to ensure that they provide the best medical care, to the fullest extent of their abilities, to all those in need.

They work in hospitals, clinics, or medical centers, (public, private, or NGOs) as clinicians, where they treat patients for their illnesses and injuries. They record patient information, order diagnostic tests, diagnose ailments and then prescribe medications. They serve also in medical schools and health science colleges both as a clinician and as an academician, training future doctors and other health professionals. They also actively involved in

health-related researches and apply the findings to the best of the community. Furthermore, they attain a leadership position in hospitals (as a hospital medical director), in health offices (zonal, regional and national level) and in many local and international organizations like ENAPAL, UNICEF, WHO, UNFPA, etc.



Picture 8: Medical doctors in the operation theatre Picture 9: a doctor examining a patient

2.6.3. Core Competencies of Physicians/Doctors

- **Medical expert:**Physicians as medical experts provide high-quality, safe, patient-centred care, collect and interpret information, make clinical decisions, and carry out diagnostic and healing/therapeutic interventions.
- **Communicator:** Physicians/doctors are expected to have good interpersonal communication skills that result in effective information exchange and teaming with patients, patients' families, professional associates and community at large.
- **Collaborator:** Physicians work effectively collaborating with other health care professionals and support staff to provide safe, high-quality and compassionate patient-centered care.
- **Leader:** Physicians as a leader develop a vision of a high-quality health care system and, in collaboration with other health care leaders, take responsibility for effecting change to move the system toward the achievement of that vision.

- **Health Advocate:**As health advocates, physicians contribute their expertise and influence as they work and be role models for communities or patient populations to improve health. They work with those they serve to determine and understand needs, speak on behalf of others when needed, and support the mobilization of resources to effect change.

- **Scholar**: Physicians as Scholars demonstrate a lifelong commitment to excellence in practice through continuous learning, the teaching of others, the evaluation of evidence, and contributions to scholarship.

- **Professional:**Physicians as professionals are committed to the health and well-being of individual patients and society through ethical practice, high personal standards of behaviour, dedication to the profession, profession-led regulation, and maintenance of personal health.

2.6.4. Professional Career

It's defined as educational and professional path that medical doctors can pursue based on additional training and experience.

- A medical doctor with an additional three or four years training can specialize in dermatology, surgery, orthopedics, pediatrics, internal medicine, ophthalmology, obstetric gynecology and so on and become a specialist.
- He/she also can again upgrade his/her status by having a one/two-year sub-specialization training and be a subspecialist in sub-specializations like cardiologist, pulmonologist, retina specialist, uro-surgeon, plastic surgeon…. and so on.
- A medical doctor also can add up different master programs (like masters in general public health, epidemiology and biostatistics, nutrition, field epidemiology, health management … and so on).
- If a medical doctor is working in the academic environment with any type of specialty status, he/she can attain a status of assistant lecturer, lecturer, and dealing with researches he/she can be an associate professor or professor.

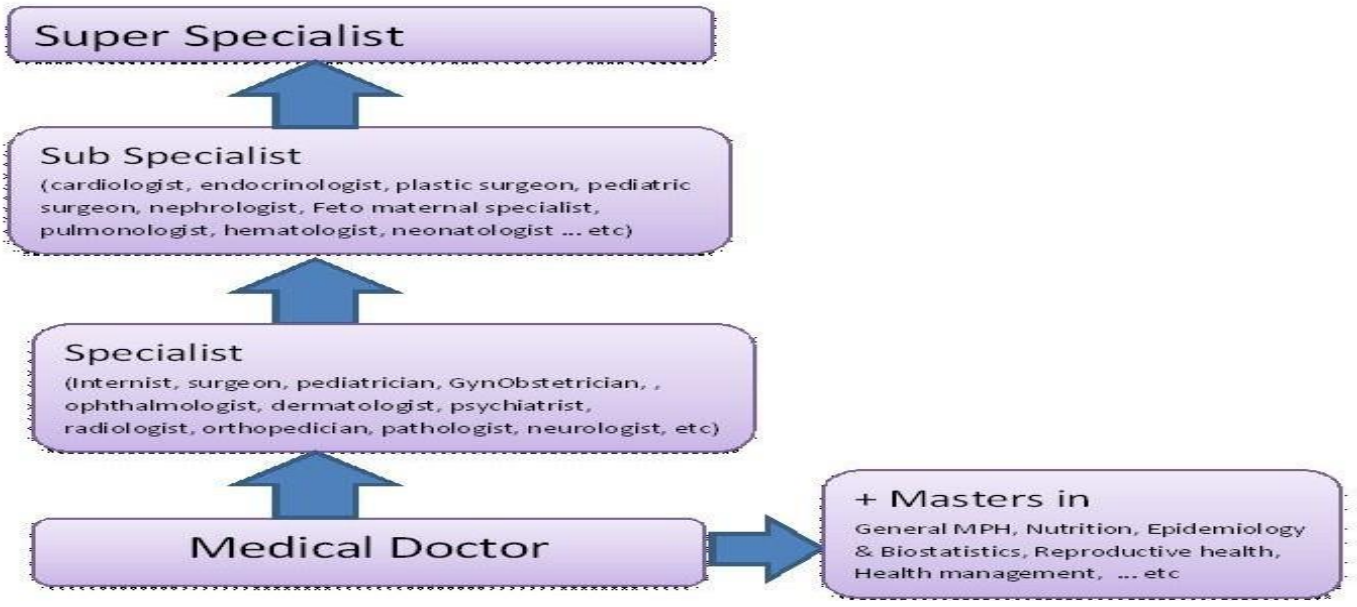


Figure 10: Professional career development of medical doctors

NB. The super specialist level is rare in our country (very few ones), and there is even one more ladder called "Reader" and it's totally non-existent in our practice but it exists in some countries of Europe and in America.

2.6.5. Opportunities and Challenges of being a Medical Doctor

I. Opportunities of being a medical doctor

- It is a job that comes with high levels of personal satisfaction by saving the lives of others;
- It is a profession which grants a good job opportunity in any part of the world with higher social status;
- Doctors continuously learn on the job as medicine and technology constantly update and evolve. Doctors' minds are all the time on the move, learning and applying new medical science almost every day;
- It offers diverse career specialization opportunities;
- It is an opportunity to enjoy teamwork and cooperation;
- On a managerial level, you can become department head, hospital medical director, medical school dean, health science college dean, university president, head of offices (zonal, regional and national); and

- It offers also a path to move into academic medicine or do research within a specific specialty area;

II. The challenges of becoming a medical doctor

The challenges that come across with being a medical doctor can be put in two categories:

As a medical student

The time spent in medical school has several challenging experiences like:

- Dealing with time constraints to cover the vast portions of medical courses that may lead to experiencing stress;
- Developing professional identities (night shifts, unsocial hours, bedside teaching, morning meeting…etc);
- On-going study with only fixed and short yearly vacation;
- It takes a long time to become a medical doctor. You must spend at least six years in a medical school and earn your undergraduate degree before getting the title of a medical doctor;

As a physician

- You are going to be working long and unpredictable hours in this career. Many doctors find themselves working long hours each day and not having enough time to spend with their family and friends, serving on-call responsibilities, treating people after-hours because of emergencies, and responding to calls at all hours including weekends and holidays.
- It may become tough for some to manage the balance between work and life together.
- There are high levels of job-related stress in this career. Even though it is highly rewarding to be in a position to save lives, this role can also become highly stressful: such as making a mistake, losing a patient, or fearing the loss of one. It is not unusual to lose some one's life while endeavoring to save;
- There are lawsuits for any medical malpractice to worry about as a doctor. The amount of stress that these issues cause, along with the potential hit to your reputation, can make it challenging to stay in the career.

- There might be lack of adequate resources (medical equipment, drugs) to perform the work efficiently.

There is also a possibility of being deployed in an area where accesses to basic facilities like housing roads, electricity, etc are limited.

2.4.6. Things that you should consider before you choose medicine as your career

- You should clearly understand that helping others and saving lives gives you the highest professional satisfaction mostly without gaining any financial benefit;
- You should be able to stay for long hours (sometimes 36 continuous hours) in a hospital, including some difficult nights, weekends and holidays;
- You should withstand living with compromised social life due to your job;
- You should be able to shoulder stressful situations studying courses and serving people in need;
- You should be aware that handling a person who is bleeding, or someone who is in severe pain, or a woman who is in difficult labor pain, is part of your routine duty;
- You should know ahead that you can be assigned in any remote rural area where facilities are very limited and your personal comforts are to be of less priority;
- You should know very well that you should treat all people equally despite their differences in age, gender, religion, literacy status, economic status, etc.
- You should be aware of the major core values in health especially as a medical doctor such as confidentiality, impartiality, loyalty, transparency and so on.You should have a good knowledge of your high school natural science courses;
- You should have patience and commitment to study a six years course;
- You should be aware that you are going to spend long hours in libraries having rigorous reading of a number of medical text books;
- You should also be capable to spend weekends and holidays preparing for exams almost throughout the year;

2.7. Medical Radiologic Sciences Profession

2.7.1. Historical Background of Medical Radiologic Technology

The origin of medical images is around the start of the 20th century, after the discovery of the x-ray by Professor Wilhelm Conrad Roentgen in 1895. Medical imaging initially started with x-rays that would be passed through the body onto some film, which would generate an image. They could take up to 11 minutes and would subject the patient to 50 times more radiation than an x-ray today, which takes just milliseconds. Another big step was in the 1970s, when digital imaging techniques, such as the computed tomography scanner, more commonly known as the CT scanner, became widely available.

The department of radiography (currently called Medical Radiologic Technology) was established in 1963 G.C. at the premises of Manlike II Hospital by an English expatriate named Mr. Webb with the assistance of the World Health Organization under the proprietorship of the Ministry of Health. The duration of the training was two years and the award given was diploma in diagnostic radiography.

The department was transferred to Tikur Anbessa Hospital in 1974 G.C and had been able to produce only few radiographers for the last 40 years of its existence at diploma level (until 2004/05). The department of radiography was officially taken over by Addis Ababa University in 1998. The most remarkable achievement that was scored by the department was in the academic year 2004/2005 when a BSc program was launched with the full support of the school of medicine and department of radiology. The total number of students that were graduated from the school with BSc degree until 2018/19 is 900.

New technological advancements are evolved in medical imaging technology. These include Magnetic Resonance Imaging, Medical Ultrasound and Computed Tomography.

2.7.2. Being a Medical Radiologic Technologist

Medical Radiologic Technologist are professionals who can now play a central role in the global healthcare system as they contribute to improved patient outcome and more cost-efficient healthcare in all major disease entities by using many different imaging modalities such as conventional radiography (x-ray), Computed Tomography (CT), Magnetic Resonance Imaging (MRI) and ultrasound (US).

An important goal is to exploit the synergies of different methods. These new methods combine the ability to measure and quantify biological processes with the ability to localize the measured entities into a high-quality anatomical image.

Therefore, Radiologic technologists work with patients who are experiencing some type of health trouble in order to better understand and pinpoint the cause of various diseases. They are also needed to assist those who administer care, such as physicians, nurses, and other medical professionals, in identifying and diagnosing the symptoms or causes of a wide range of health concerns. Therefore, being a medical radiologic technologist, these professionals are engaged in the following activities.

- Perform radiographic examinations safely and competently;
- Perform special radiological procedure by the department's protocol;
- Carry out clinical Computed Tomography and Magnetic Resonance Imaging examination;
- Perform and report abdomen-pelvic and obstetrics ultrasound examinations;
- Interpret and report routine conventional radiographic images based on the general guidelines and department's protocol;
- Provide appropriate care to patients in their respective department;
- Teach and supervise students in hospitals, colleges and universities;
- Apply the safe use of radiation in reference to the radiation safety rule;
- Assume administrative and supervisory responsibilities at the department and health institution at large.



Picture 10: Medical Radiologic Technologist during study and practicing at work place

2.7.3 Core Competencies

I. Medical Imaging Competencies

- Operate radiologic equipment safely and appropriate to the scope of practice;
- Perform X-ray examinations, special radiographic procedures, Basic CT (Computed Tomography) scan examinations, and Basic MRI (Magnetic Resonance Imaging) scan examinations;
- Perform and report ultrasound examinations for various group of patients;
- Interpret and report routine radiographic images within their professional scope

II. Research Competency

- Participate in clinical research and share information through publication, presentation and collaboration;
- Conduct clinical audit and need assessment, and facilitate teaching and learning in a clinical environment; and
- Provide health education related to radiological service.

III. Leadership and Management Competency

- Lead organizational structure by applying principles of management function;
- Solve working environment dispute by using conflict management principles; and

- Utilize resources effectively, efficiently and use patient information management system as per national standard.

IV. Professionalism Competency

- Communicate clearly, sensitively and effectively with client, family, health care provider team and community; and
- Practice Compassionate, Respectful and caring behavior at all levels and settings.

V. Quality Assurance and Safety Competency

- Perform routine quality-control tests and apply safety principles;
- Manage routine image artifacts on each modality;
- Apply radiation protection and infection prevention principles; and
- Maintain safe working environments.

2.7.4 Professional Career

A. Vertical

Medical Radiologic Technology is a science combining advanced technology, human compassion and uses their knowledge of physics, basic sciences, general radiography, pathology, clinical medicines, and medical ultrasound to create permanent medical images and to interpret these images.

Radiologic technology is one of the fastest-growing areas within the health care system at present, both in the clinical setting in hospitals and in research and development. This profession requires a dependable personality with a mature and caring nature and people in this profession may specialize in a particular area or pursue careers as educators, researchers, consultants, or administrators.

The constant growth in this field will create many new and exciting career opportunities for radiologic technologists and provides quality service to the community. Therefore MSc program in master of science in medical radiologic technology (US, CT, MRI) is designed and under process of endorsement and hopefully it will be launched by the coming January, 2020.

B. Horizontal

Although the radiologic technology department encourages all graduates to pursue their career vertically, any interested graduates can also join MSc program in biomedical sciences (anatomy, physiology), and public health (MSc in Health Informatics, Health education, general public health, health service management, public health nutrition, etc.)

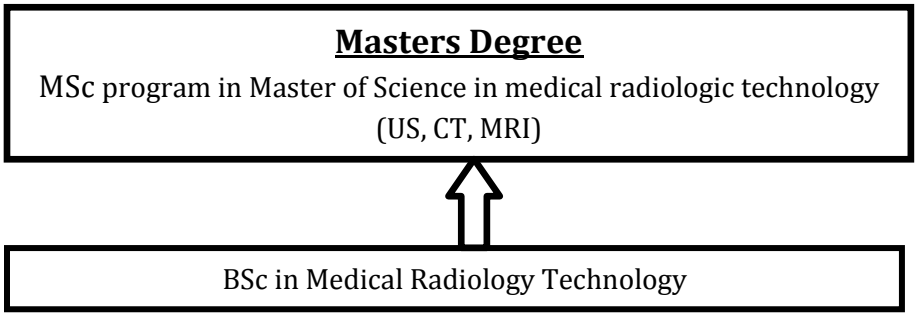


Figure 11: Professional career development of Medical Radiography Profession

2.7.5 Opportunities and Challenges of Medical Radiologic Technologist

A. Opportunity of being Medical Radiologic Technologist

- Students who join the department can enjoy the field because it helps patients in identifying their specific problem hence it is considered as the heart of medicine.
- Medical radiologic technologists after graduation have a good job opportunity in various areas of the country (public and private health institutions) as there is human resource scarcity in the field.
- The profession is more dynamic and technology-based discipline, which requires high caliber professionals who enjoy working on advanced imaging technology.
- A medical Radiologic Technology is an integral part of a growing field in which employment is excellent.
- Graduates can have versatile knowledge of various imaging modalities (X-ray, Computer Tomography, Magnetic Resonance Imaging and Ultrasound).
- Graduates can have the opportunity of getting attractive international jobs.

B. Challenges of being Medical Radiologic Technologist

- Radiation exposure is there if appropriate care is not used according to the radiation protection principles.
- Risk of infection will follow if infection control and safety guidelines are not followed.
- Radiological service is resource intensive and there are limited numbers of high tech imaging instruments for practical attachment.
- Currently, there is lack of postgraduate programs in the field in Ethiopia. However, students can advance the career up to PhD abroad.
- There might be frequent equipment breakdown and lack of well-qualified professionals for maintenance.
- There are limited continuous on the job training
- Attention of stakeholders to make an effort for advancement of the field is lacking.
- Access to radiation protection devices is limited.
- Besides standing up all day, you may also be required to help lift patients who are unable to lift themselves. Students have to be in relatively good physical condition to work in this field.

2.7.6 Things to consider before choosing Medical Radiology Technology as your future career

- Are you physically fit?
- Are you good at physics and Mathematics?
- Are you good enough in English writing skill?
- Are you good in time management?
- Interest of Instruct and guide the students in the proper method of patient care.
- Working ability on stressful environment/ working in a medical environment that may involve injuries, sick patients, and other situations

- Appropriate keeping of patient documentation and reporting ability must be provided
- work closely with patients, doctors, and others to provide the best care
- Have good interpersonal relationships with all personnel
- Ability to perform the job with understanding, patience, and reassurance to provide quality care.

2.7.7 Midwifery

2.7.8 Historical Background of Midwifery

The practice of Midwifery and the support of midwives to the mother and the newborn have been there since the emergence of human. Midwifery as a profession has passed through varying stages in different countries. In most countries, modern midwifery training and well-regulated practice started in the 20th century.

Midwifery practice, after formal trainings, has a history of more than 60 years in Ethiopia. The first formal midwifery training began in 1954 with post-basic training in midwifery for nurses at Gondar Hospital. Following this, a midwifery school was opened at Princess Tsehay Hospital by Dr. Catherine and Dr. Hamlin in 1959 which has unfortunately ceased operation in 1962. Meanwhile the Gondar Hospital was opened in 1964 and the Addis Ababa Midwifery School was also opened in 1986 with the support of the Swedish International Development Agency. In 2000, the University of Gondar became the first Institute to offer a Bachelor of Science Degree in midwifery. Meanwhile it also became the first university in Ethiopia to offer master's degree in clinical midwifery program. Then Addis Ababa, Mekelle and other universities also started the training.

Currently, there are 16,087 Midwives in the country and about 33 universities providing Midwifery training at bachelor level, 6 universities providing Masters Programs in Midwifery and one university providing PhD program.





Picture 11: Show that First Leopard Maneuver for pregnant mother at ANC

Picture 12: Midwife practices at work place

2.7.9 Being a Midwife

Midwifery is an internationally recognized profession that deals with pregnancy, childbirth, post-partum period including care for the newborn, the sexual and reproductive health of Adolescents and women throughout their lives. A professional in midwifery is known as a Midwife.

Being or becoming a midwife is an inspiring and immensely fulfilling role that requires passion and commitment to developing a relationship of trust and confidence with those clients in the care to improve women's health care. Every day is different, bringing with assorted experiences and challenges, and midwives need to have the knowledge and skills to be able to respond to all of these appropriately and competently.

Being a midwife means being able to take responsibility for your own actions, as well as recognizing when to refer to others for assistance and guidance. This results in being able to communicate effectively and work in partnership with your coworkers, as well as with other teams of health care professionals.

Being a midwife means being able to treat all women and their partners with compassion and respect, irrespective of class, economic status, race, sexuality or age, seeing them as individuals and tailoring their care appropriately.

Being a midwife means

- Having Partnership with women to promote self-care and the health of mothers, infants, and families;

- Respecting human dignity and for women as persons with full human rights;
- Advocating for women so that their voices are heard and their health care choices are respected; and
- Having cultural sensitivity, including working with women and health care providers to overcome those cultural practices that harm women and babies.

As clinical service providers, Midwives provide women centered care, focus on health promotion and disease prevention that views pregnancy as a normal life event, advocate for normal physiologic labor and birth to enhance the best outcomes for mothers and infants.

Other than providing the care, being a midwife also requires maintaining accurate, legible and contemporaneous documentation every time, as evidence of the care given.

2.7.10 Core Competencies for Midwifery Practice

Midwifery is a practice of both science and art; Midwives can work as:

I. Clinical Experts: Midwives provide High quality, individualized, evidence-based, culturally sensitive, compassionate, respectful, and caring. They provide pre-pregnancy care and family planning services, Antenatal care Labor and delivery, postpartum services, Gynecologic care, Sexual and reproductive health services, as well as Care for and manage health problems on neonates and under-five children

II. Leaders/Managers: Midwives have a role in planning, management, leadership and transformation of healthcare services to ensure availability, accessibility, acceptability and quality of sexual, reproductive, maternal, newborn and child and Adolescent health services.

III. Scholars: Midwives as educators and researchers involve in academic teaching-learning activities including curriculum development and conduct ethically acceptable scientific health research to solve community problems, critically appraise literatures and utilize updated evidences.

IV. Collaborators: Midwives collaboratively work with partners and other health care professionals for the benefits of women and their families.

V. Advocators: Midwives advocate for the women's and their family's' right to access quality health services and contribute to the empowerment of women for autonomous decision making to seek care.

VI. Counselors: the midwife had an important task to counsel and educate women and their families to maintain safety from preparations for parenthood to safe motherhood.

2.7.11 Careers in Midwifery Profession

Women, children, and families have better lives because of the work of midwives. If you want to make a difference and have a positive influence on health care, the midwifery profession is for you.

Caring for women during pre-pregnancy, pregnancy, labor, birth, postpartum and providing reproductive health services is a centerpiece of the professional experience of midwives. There are, however, variety of career options for Midwives from clinical practice, education, administration or research to involvement in policy and legislative affairs. There opportunities to work in a variety of settings including the antenatal unit, labor and delivery units, postnatal clinics, family planning, adolescent and youth sexual and reproductive health units. Midwives can practice in any setting including the health centers, primary hospital, general hospital and in a specialized referral and teaching hospitals.

Academic career opportunities to upgrade the profession are available in multiple universities that Midwifery training opportunities are available in Bachelors, Masters and PhD in Midwifery levels as well as midwives can study other clinical and public health specialties.

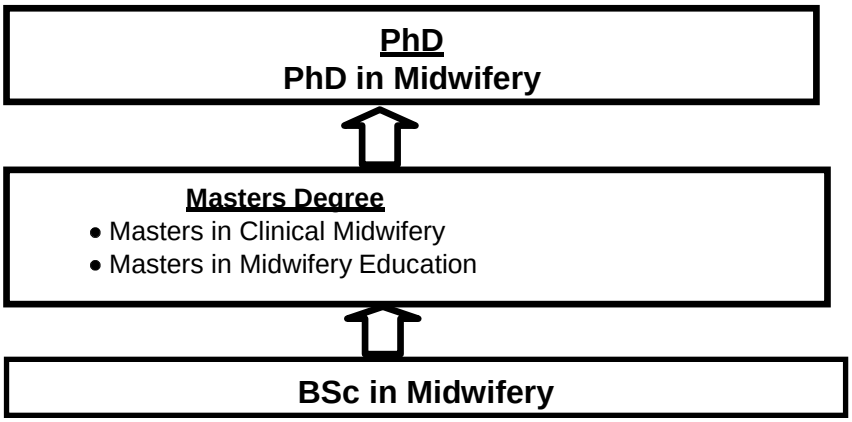


Figure 12: Professional career development of Midwifery

2.7.12 Opportunities and Challenges of Being Midwife Professional

A. Opportunities

- In their daily practice, midwives face women in labor pain; worried families and fear of the mother herself for complications; and upon birth with the help of a midwife, the woman forgets all the pain; all enjoy with happiness; there is nothing that gives happiness than helping people and midwives enjoy this every day;
- midwifery service has become a global agenda in increasing women's access to high-quality and realizing the right of every woman to the best possible health care;
- Regarding the case of Ethiopia, it still demands more midwives in the future to reduce maternal and neonatal morbidity and mortality;
- Since midwifery is an internationally recognized profession, a midwife can compete and work in international markets;
- Play a key role in reducing the maternal and infant death rate and opportunities to empower woman;
- continues professional development opportunities available; and
- The presence of independent professional association supported by its members and recognized by the government regulatory authority and education programs.

B. Challenges

- Since the time of labor and childbirth are unpredictable events, being a Midwife requires working for longer hours, night time, weekends and holidays which is an exhaustive practice.
- Not every pregnancy, labor and delivery goes normal. Sometimes unexpected situations arrive and emergencies happen frequently and may face bad outcomes that make the life of midwives stressful.
- Since the midwives' daily work practice is related to assisting births, performing invasive procedures and managing obstetric emergencies, there are some chances of being exposed to blood and other contaminated body fluids.

2.7.13 Things to Consider Before Choosing Midwifery as Your Career

Personality

- Do you have respect for people?
- Are you compassionate for people in problems?
- Do you enjoy helping and taking care of people?
- Are you committed to community service and ethical behavior?
- Do you give attention to humanity?
- Are you patient and focused?

Skill

- Do you have good communication skills?
- Do you have problem-solving skills?
- Are you able to do more than one thing at a time?

Motivation

- Do you have sincere motivation for Midwifery and realistic knowledge of the profession?
- Do you need to see tangible results for your efforts?
- Do you enjoy being involved in patients' lives?

Values

- Do you value time?
- Are you willing to work day times, night times, weekends and long hours?
- Do you like working in harmony?
- Are you Punctual in your daily activities?

2.7.14 Nursing

2.7.14.1 History and Development of Nursing

It is difficult to trace the exact origin of the nursing profession. However, moral action is the historical basis for the creation, evolution and practice of nursing. In 460 BC Hippocrates emphasized the importance of patient care that contributed a lot for the groundwork of nursing.

Florence Nightingale, the founder of modern nursing, was born in 1820 in Britain from the wealthy and intellectual family. In spite of opposition from her family and restrictive societal code for affluent young English woman to be a nurse, Nightingale believed "called" by God to help others and to improve the wellbeing of mankind. The achievements of Florence Nightingale in the Crimean war were so outstanding and recognized by the queen of England who awarded her the Order of Merit and established the Nightingale School of Nursing in 1860.



Picture 13: Florence Nithingale, Crimean war soldiers and nursing students at class room

In ancient Ethiopia, illness was treated by religious people and traditional healers using various plants and herbs. Modern nursing in Ethiopia started in 19th century by Swedish Missionaries who came to Eritrea in 1866 and extended in the country by expatriate nurses from Sweden, Russia, and France. In 1917 Sister Karin Holmer came as trained nurse and some clinics and hospitals were opened at this time. Then, the need for nurses felt more than ever. Around 1928 elderly women were recruited and given short term training to serve as nurses and midwives.

In 1939, Emperor Haileselassie's daughter Princess Tsehay and Meheret Paulos were the 1st and the 2 nd national Ethiopian trained nurses respectively. In 1948 the first Ethiopian RedCrossschool of nursing established by Imperial Majesty in the then private hospital Bet-

Saida (current Yekatit 12 hospital). In 1954**,** Gondar Health College and training center were opened and gave training to community nurses. In 1977, the nurse training was revised and changed from “community nurse” to "Comprehensive nurse". A remarkable time in the history of nursing in Ethiopia was the launching of post basic baccalaureate program of nursing in 1994 in Jimma institute of health science.

Later in 2004, the generic baccalaureate nursing program became one of the most common academic programs offered by governmental and private universities. The objective of the baccalaureate program was to produce competent and professionally prepared nurses to address individuals, families and communities health care needs.

2.7.14.2 Being a Nurse

According to the International council of nurses (ICN, 2002), nursing is defined as autonomous and collaborative care for individuals of all ages, families, groups and communities, sick or well and in all settings. Nursing is a humanistic science dedicated to compassionate concerns with maintaining and promoting health, preventing illness and caring for and rehabilitating the sick, disabled and dying people.

A nurse is a person who has completed a program of basic nursing education and is authorized by the appropriate regulatory authority to practice nursing in his/her country. Basic nursing education is a formally recognized program of study providing a broad and sound foundation in the behavioral, life, and nursing sciences for the general practice of nursing.

The practice of nursing includes:

- prevention, diagnosing and treating human response to actual or potential health problems through case finding, health teaching, health counseling; and provision of support or restoration of life and well-being and executing medical treatments prescribed by authorized professionals.
- Promote health and wellbeing for people and their families, colleagues, the broader community and themselves and in a way that addresses health inequality.

- engage with people as individuals in a culturally safe and respectful way, foster open and honest professional relationships, and adhere to their obligations about privacy and confidentiality
- Practice honestly and ethically and should not engage in unlawful behavior as it may affect their practice and/or damage the reputation of the profession.
- Making decisions about healthcare is the shared responsibility of the person (who may wish to involve their nominated partners, family and friends), the nurse and other health professionals.
- Create opportunities for nursing students and nurses under supervision to learn, as well as benefit from oversight and feedback.
- Provide nursing care to patients like bed bath, patient feeding, wound care, medication administration, preparing patient for operation and other procedures, comforting patient, rehabilitative care, geriatric care, palliative care and so on.



Picture 14: Nurses during care provision

2.7.14.3 Core competencies in Nursing

Nurses provide safe, person-centered and evidence-based practice for the health and wellbeing of people and, in partnership with the person, promote shared decision-making and care delivery between the person, nominated partners, family, friends and health professionals. Core competencies include

- **Care provider**: Nurses as Care provider provide holistic care (feeding, wound care, medication administration, vital sign etc.) that recognizes individuals' preferences, values and needs and respects the client or designee as a full partner in providing coordinated, age and culturally appropriate, compassionate, respectful, safe and effective care.
- **Communicator** expected to acquire empathic communication skills and techniques for effective interpersonal relationships with people and other professionals in health care settings.
- **Teacher/educator**: commit to teaching, supervising and assessing students and other nurses, in order to develop the nursing workforce across all contexts of practice. A comprehensive nurse professional must actively engage in educational quality improvement initiatives and demonstrate competence in the domain of educational and professional development.
- **Counselor**: help a client to recognize and cope with stressful psychological or social problem, to develop improved interpersonal relationships and promote personal growth.
- **Manager:** work as a team leader, change agent, patient advocator, planner and mentor for the wellbeing of clients, rapid recovery, independence and safety through efficient use of scarce resources and instituting a continuous performance improvement process.
- **Researcher**: Nurses recognize the vital role of research to inform quality healthcare and policy development, conduct research ethically and support the decision-making of people who participate in research. They also actively engage

in scientific research endeavors, interpretation and application of evidences in clinical practice and quality improvement interventions

2.7.14.4 Professional carrier

Nursing professionals can develop their professional carrier to either horizontal or vertical careers concerning education through attending different programs both in Ethiopia and abroad.

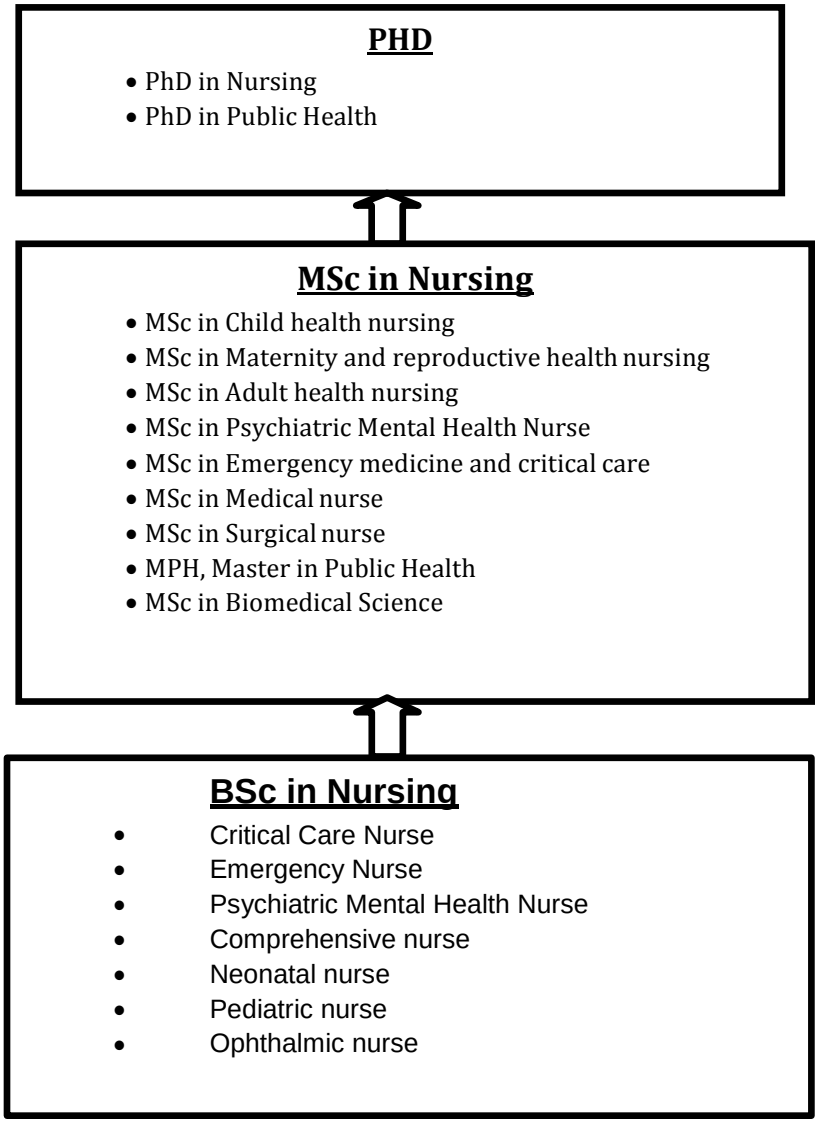


Figure 13: Professional career development of Nursing

2.7.14.5 Opportunities and Challenges of Being Nursing Profession

A. Opportunities

- The lifesaving part
- Nursing is a highly respected field, and there is a great demand for highly skilled nurses nationally and around the globe. Nursing is an internationally accepted profession and hence nurses can work in any country in the world.
- After you become a licensed nurse, you can go in many directions in your professional development career up to PhD level.
- You can also work in many different departments within the organization like pediatric, gynecology, medical, surgical, emergency ward, psychiatric and so on.

C. Challenges

Major challenges that nurses are facing today include:

- Having long working hours daily, during weekends, night times and holidays is among the challenges of the profession.
- The work's nature by itself is stressful since nurses pass much of their time with seriously ill individuals in recovery room, intensive care room and emergency rooms.
- Nurses are exposed to contaminated sharp edged materials while conducting different patient care procedures.
- Since nurses are responsible to look after the patients, they are always at the risk of being exposed to various infectious diseases that patients acquired like multi drug resistance Tuberculosis, HIV, hepatitis B etc.
- Employment of remote areas where infrastructure electric light, road, network, pipe water etc. is limited.

2.7.14.6 Things to Be Considered Before Choosing Nursing Profession

- Am I having a commitment to study long hours?
- Am I having a commitment to work during public holidays, overnight and weekends?
- Am I having a commitment to work if assigned in remote rural areas?
- Can I share my nursing knowledge with patients, colleagues, students and others?
- Can I base my practice on current scientific evidence?
- Can I encourage clients/staff/students to ask questions and raise concerns?
- Can I respond to client/staff/student concerns appropriately?
- Am I respecting personal values and having compassionate nature?
- Can I make patients my primary concern while providing nursing care?
- Can I assist clients to make informed choices?
- Can I respect the decisions of capable clients?
- Can I protect the privacy and confidentiality of client information?
- Can I respectfully treat coworkers?
- Can I show respects for the professional knowledge and skills of colleagues?
- Can I identify ethical issues and take action to resolve them?
- Can I practice in line with the scope of nursing practice?
- Can I take appropriate action when client safety may be at risk?
- Can I maintain my own physical, psychological and emotional fitness to practice?
- Can I manage personal stress effectively in the workplace?
- Can I practice within my own level of competence?
- Can I engage in professional development?

2.8 Optometry Profession

2.8.1 Historical Background of Optometry

Optometry is an independent primary eye care profession concerned with the examination, diagnosis, treatment, and management of diseases and disorders of the visual system, the eye and associated structures as well as diagnoses related systemic conditions and refers accordingly. Optometry program has begun about 100 years ago when the first optometry licensure laws were passed in the US.

Optometry program has been given worldwide in two ways; one as Doctor of Optometry (DO) in countries like the USA, West Africa, and some state of Australia as 6 yrs training; two, as bachelor degree (BSc) in countries like the UK, South Africa, some state of Australia and east Africa as 4 yrs of training. Further studies are also possible for MSc and PhD.

In Ethiopia optometry was started in 1998 E.C at Gondar University with 16 students at that time. Now, there are 420 optometrists in Ethiopia and most of them are working in the main cities of the country. VISION 2020 targets one optometrist to 50,000 populations but currently in Ethiopia, the ratio of one optometrist to population is approximately 1 to250, 000.

The prevalence of blindness and low vision in Ethiopia is one of the highest in the world. Furthermore, at least 80% of causes of blindness and low vision are either preventable or treatable. Top causes of blindness and low vision in Ethiopia were cataract (የዓይን ሞራ ግርዶሽ), uncorrected refractive error (በመነጸር የሚስተካከል የእይታ ችግር), trachoma (የዓይን ማዝ) and glaucoma (የዓይን ግፊት).

As a result, the optometrist has a big role to diagnose, treat, and correct the above major causes of blindness and low vision.

2.8.2 Being an Optometrist

Being an optometrist is a front line eye health professional to help people in the world to have better vision. Optometrists work in collaboration with other eye care professions like

ophthalmologist, ophthalmic nurses, ophthalmic officers and other disciplines to reduce blindness and visual impairment. Mostly optometrists work full time including night and weekend duty hours in different hospitals, universities, clinics and NGOs.

To be optometrist, students should fulfill the following entrance requirements;

- Good at Mathematics and Physics;
- Pass an eye examination with best-corrected visual acuity of 6/9, adequate stereopsis (100 Sec of arc) and normal color perception; and
- Be physically able to perform all ophthalmic examinations required for the profession.



Picture 15: Optometrist at work place

2.8.3 Core Competencies

The following core competencies are expected from an optometric

I. Patient Care

Trainees must be able to provide patient care that is compassionate, appropriate, and effective for the treatment of eye problems. They are expected to:

- Communicate effectively and demonstrate caring and respectful behaviors when interacting with patients and their families;
- Make informed decisions about diagnostic and therapeutic interventions; like performing refraction and prescribing eyeglasses or contact lenses for refractive errors, performing eye care services including the diagnosis and management of the eye diseases/disorders, performing minor eye surgery, run low vision rehabilitation programs;
- Ready to be assigned as eye care workers at primary, secondary and tertiary eye care levels.; and

- Work with health care professionals.

II. Medical Knowledge

Optometrists must demonstrate knowledge about established and evolving biomedical, clinical, and related sciences and the application of this knowledge to patient care.

III. Skill-based Learning and Improvement

- Trainees must be able to investigate and evaluate their patient care practices, appraise and assimilate scientific evidence, and improve their patient care practices. They are expected to:
- Obtain and use information about their own population of patients and the larger population from which their patients are drawn; and
- Apply knowledge of study designs and statistical methods to the appraisal of clinical studies and other information on diagnostic and therapeutic effectiveness.

IV. Interpersonal and Communication Skills

- Trainees must be able to demonstrate interpersonal and communication skills that result in effective information exchange and teaming with patients, patients' families, and professional associates. They are expected to:
- Use effective listening skills, elicit and provide information and work effectively with others as a member or leader of a health care team or other professional groups.

V. Professionalism

- Trainees must demonstrate a commitment to carrying out professional responsibilities, adherence to ethical principles, and sensitivity to a diverse patient population. They are expected to:
- Demonstrate respect, compassion, and integrity;
- responsive to the needs of patients and society that supersedes self-interest;
- accountable to patients, society, and the profession;
- committed to excellence and on-going professional development;

- Demonstrate a commitment to ethical principles pertaining to provision or withholding of clinical care, confidentiality of patient information, informed consent, and business practices; and
- Demonstrate sensitivity and responsiveness to patients' culture, age, gender, and disabilities

2.8.4 Professional Career

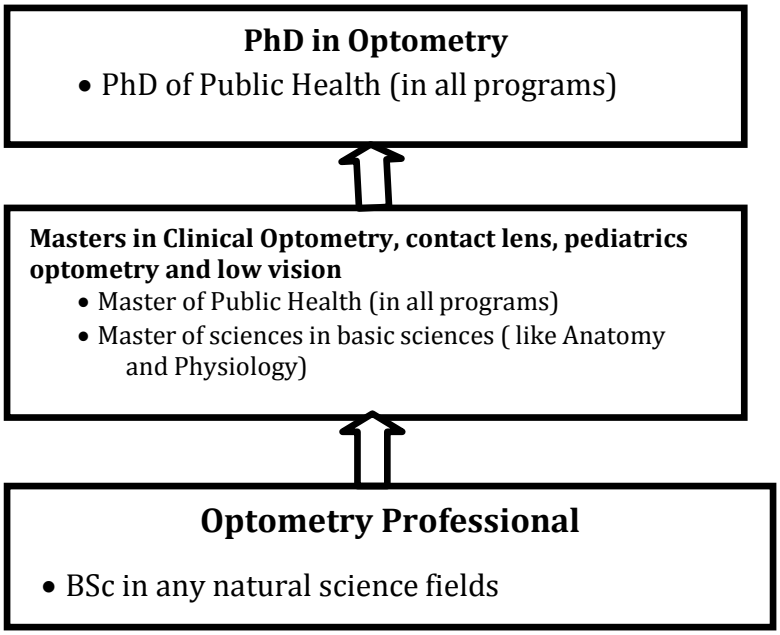


Figure 14: Professional career development of Optometry professional

2.8.5 Opportunities and Challenges of Being Optometry Profession

A. Opportunities

- Autonomous working environment;
- Licensed to have one's own private clinic; and
- Able to work on both academic, clinic and business sectors.

B. Challenges

- Needs more reading and practical exposure to the patient and instruments;
- Insufficient and/or lack of eye care equipment's in different hospitals; and
- Less awareness among the society about the profession.

2.8.6 Things to consider before choosing an optometry Profession

- Do you like helping peoples in any aspect?
- Do you like a health-related profession?
- Are you patient during stressful conditions?
- Would you consider joining the optometry profession because of your passion for the profession although you have other types of job
- Are you happy to give eye care services; by prescribing glass, medication and minor eye surgery?
- Do you have good performance in mathematics and physics?
- Are you good communicator both verbally and in writing? Do you relate easily to people in ordinary conversational settings?
- Can you discuss with goal of reaching an agreement?
- Can you reason quantitatively so that problems having numerical solutions can be solved without the aid of a computer or other mechanical device?
- Can you systematically gather information for a particular field of knowledge to establish certain facts or principles?
- Are you skilled in using your hands?
- Can you manage or direct work of others?
- Can you help others learn how to do or understand something; able to provide knowledge or insight?
- Can you make judgments or reaching conclusions about matters which require specific action and able to accept responsibility for the consequences of such actions?
- Do you think that you are good at health professions? (to be answered by your family members)
- Do you want to do without much direction from others?

2.9 Pharmacy

2.9.1 History of Pharmacy

The word pharmacy was coined from the Greek work ‘’*pharmakon*” meaning “medicine/drug”. Pharmacy revolves around people and medicines with special emphasis on the manufacture of medicines, their supply, appropriate use and effects. It is a profession that links Health Science with chemical sciences. The history of pharmacy as an independent science dates back to the 19 th century. Before then, pharmacy was considered as part of medicine.

Ancient Ethiopians relied on traditional medications and modern medicine was not known until the 19 th century. In the mid-20 th century, the country established higher learning institutions which started teaching pharmacy. The first pharmacy school was opened in 1961 G.C in Addis Ababa. A young French/Georgian pharmacist, Dr.Merab, was the first person to open community pharmacy and provide service in Addis Ababa. The picture below (Figure 1) shows one of the pioneer pharmacies established in Ethiopia.



Picture 16 : One of the pioneer pharmacies established in Ethiopia.

Formerly, product-oriented pharmacy education had been given in Ethiopia. Recently, patient/clinical/- oriented pharmacy education is being provided in the higher institutions of our country.

Pharmacists represent the third largest healthcare professional group in the world. In 2016 the number of pharmacy professionals in the country was 9582. The result of the human resource projection, on the other hand, shows that the number of pharmacy professionals will be 14040 by midterm 2020 and increase to 21608 by 2025.

2.9.2 Being a Pharmacist

Pharmacist plays a vital role in the healthcare team by providing patients with the medication they need to recover from illnesses and injuries. To be an effective health care team member, a pharmacist needs skills and attitudes enabling him/her to assume many different functions. There is a concept of the "seven-star pharmacist" introduced by World Health Organization (WHO) and taken up by International Pharmaceutical Federation (FIP) in 2000 in its policy statement on Good Pharmacy Education Practice to cover these roles: caregiver, decision-maker, communicator, manager, life-long learner, teacher and leader. Recently, the function of the pharmacist as a researcher was also distinguished.

- **Caregiver:** Pharmacists provide caring services. The practice is integrated and continuous with those of the health care system and other health professionals. Services must be of high quality.
- **Decision-maker:** The appropriate, effective, safe and cost-effective use of resources should be the foundation of the pharmacist work. Pharmacists will play role in setting medicines policy. Doing this require ability to evaluate, synthesize data and information to facilitate decision.
- **Communicator:** Pharmacist is in an ideal position to link between prescriber and patient and to communicate information on health and medicine to the public. Communication involves verbal, no-verbal, listening and writing skill.
- **Manager:** Pharmacists must be able to manage resources (human, physical and financial) and information effectively.
- **Life-long learner:** The concepts, principles and commitment to life-long learning must begin while attending pharmacy school and must be supported throughout the pharmacist's career.

- **Teacher:** The pharmacist has a responsibility to assist with the education and training of future generations of pharmacists and the public.

- **Leader:** In multi-disciplinary (e.g. team) caring situations or in areas where other health care providers are in short supply or non-existent the pharmacist is obligated to assume a leadership position in the overall welfare of the patient and the community.
- **Researcher:** As a researcher, the pharmacist can increase the accessibility of unbiased health and medicines-related information to the public and other health care professionals.



Picture 17: Pharmacists at work place

2.9.3 Core Competencies

It is envisaged that pharmacy graduates with the B.Pharm. Degree will be capable to assume the following responsibilities and attributes:

- Organize and control the manufacturing, compounding and packaging of pharmaceutical products (drugs, chemicals, medical supplies, and medical equipment);
- Organize the selection, procurement, storage, and distribution of pharmaceutical products;
- Provide patient care and dispense and ensure the optimal use of medicines by the patient;
- Provide education and information on health care and medicines;

- Promote community health and provide related information and advice;
- Conduct research to ensure the optimal use of medicines;
- Demonstrate a high level of professional ethics in order to satisfy the pharmaceutical needs of society;
- Maintain and expand knowledge through self-directed learning;
- Be able to work as a member of the health team; and
- Possess the necessary background to pursue further advanced study in pharmaceutical sciences.

2.9.4 Professional Career

There are various opportunities available in Ethiopian universities and abroad for pharmacists who want to continue their education vertically or horizontally. Several graduate-level (Masters and PhD) programs are being provided in the area of pharmacy globally. For pharmacists interested to continue their career vertically, Master's degree in;

- Pharmacology,
- Clinical Pharmacy,
- Pharmaceutics,
- Pharmacy Epidemiology and Social Pharmacy,
- Food and Drug Regulatory Affairs,
- Health /Pharmaceuticals/ Supply Chain Management (HSCM), Pharmacognosy,
- Pharmaceutical Analysis and Quality Assurance,
- Medicinal Chemistry,
- Biochemistry,
- Physiology, and
- Anatomies are some of the programs being provided in Ethiopian Universities.

Of course, a pharmacist do have the opportunity to grow further in his/her professional career at Philosophical Doctor (PhD) level on those mentioned areas of specializations as indicated in Figure 2. Horizontally, pharmacists do have opportunity to attend further education in:

- Public Health (General Public Health,
- Epidemiology,
- Biostatistics,
- Health Service Management,
- Health Informatics), and

In Social Sciences (Sociology, Business Administration, Marketing Management, Logistics and Supply chain Management) in Figure as follow:

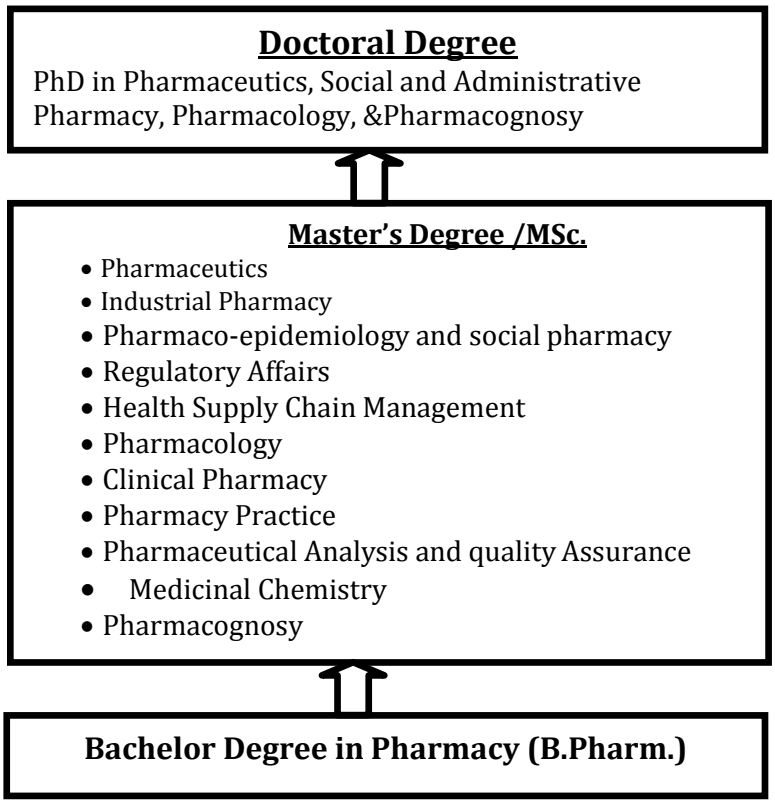


Figure15. Pharmacy Profession Career Development Opportunities

2.9.5 Opportunities and Challenges of Being Pharmacist

A. Opportunities of Being Pharmacist

A pharmacist will have the following opportunities after graduation;

- work in different areas of pharmacy practice (pharmaceutical industries, health care facility, drug regulatory areas, supply chain of pharmaceuticals, academic and research areas, consultancy) which will definitely made it to have wide job

opportunity (in governmental and non-governmental organizations) both within the land and abroad;

- compounding drugs for management of different health problems from plants, animals, minerals or synthesize in Laboratory, based on a specific prescription etc;
- test the effect of new or the available drug on different animals (Rat, Mouse, Rabbit, Genie-pig, etc.) and human being;
- formulate drugs in different pharmaceutical forms (tablet, capsule, semi-solid forms, etc);
- become a scientist in the areas of pharmacy practice;
- attend further education in different universities located globally;
- have his/her own pharmaceutical trade license to open and run business (Pharmacy, wholesale, pharmaceutical import company) or work with other business men;
- undertake pharmaceuticals quality control test so as to certify products to be distributed in the market;
- work with traditional medicine practitioners which will be an opportunity to modernize the practice; and
- Visit different pharmaceutical industries and develop experience on how to manufacture pharmaceuticals in a good way.

B. Challenges of Being Pharmacist

A pharmacist may confront with the following challenges after graduation:

- Accessibility to health care and essential medicines remains problem of our country;
- Irrational use of medicines;
- shortage of health care providers in many parts of the country especially in rural areas;
- Possibilities of working longer hours within a day;
- Potential of working on Holidays, weekends and at night time;
- Potential of working in an environment with inadequate resources;
- possibility of working in a high workload environment;

- the professional may be required to serve the community in remote areas of the country;
- Relatively long duration of the training (5 years)

2.9.6 Things to consider before choosing a pharmacy profession as your career

The candidate to join pharmacy school should rate him/herself based on the following values.

The candidate to join the pharmacy profession should rate him/herself based on the following: -

Personality

- Do you have respect for people?
- Are you compassionate for people in problems?
- Do you enjoy helping and taking care of people?
- Are you committed to community service and ethical behavior?
- Do you give due attention to humanity?
- Are you patient and focused?

Skills

- Do you have good communication skills?
- Do you have problem-solving skills?
- Are you able to do more than one thing at a time?

Attitude

- Do you like to maintain the pharmacy ethical code of conduct standards?
- Do you like to work as a member of the health team?
- Do you like to advocate the proper use of necessary materials by screening?

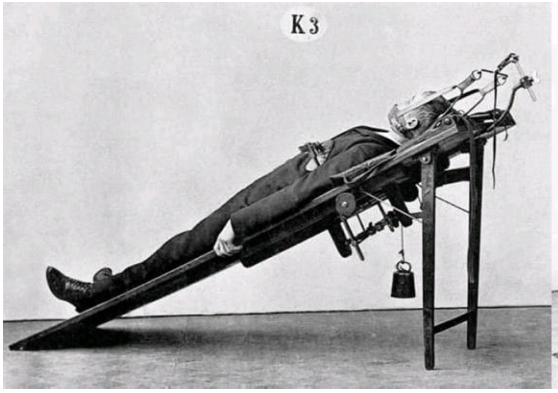
2.10 Physiotherapy

2.10.1 Historical Background of Physiotherapy Profession

Ancient practitioners including Hippocrates and later Galen were believed to have been the first practitioners of physical therapy, manual therapy techniques and hydrotherapy to treat people in 460 BC. After the development of orthopedics in the eighteenth century, machines like the Gymnastic were developed to treat gout and similar diseases by systematic exercise of the joints, similar to later developments in physical therapy.

Modern physical therapy was established during the first half of the 20th century due to events that had an effect on a global scale, Polio outbreak and World War I which called for rapid advances in physical therapy. Soon American orthopedic surgeons began treating children with disabilities and began employing women trained in physical education, and remedial exercise. The first school of physical therapy was established at Walter Reed Army Hospital in Washington, D.C following the outbreak of World War I.

The first physical therapy research was published in the United States in March 1921 in "The physiotherapy (PT) Review." In 1924, the Georgia Warm Springs Foundation promoted the field by touting physical therapy as a treatment for polio.





Picture 18: A man with cervical traction treatment Picture 19: patient doing leg press in 19th

Physiotherapy service delivery in Ethiopia began in 1982 when International committee of Red Cross and Netherlands' Development Aid Program in collaboration with Ministry of

Labor and Social Affairs trained 10 physiotherapy assistants at Prosthetic and Orthotic Center near to St. Paul Hospital Millennium Medical College in Addis Ababa.

The physiotherapy profession in Ethiopia has evolved in recent years with the establishment of a bachelor's science degree in physiotherapy at University of Gondar in 2002. In 2014 Mekelle University started by up-grading the diploma level Physiotherapist and nurses. Bahir Dar University has also established undergraduate program in physiotherapy in 2019. Similarly,

Addis Ababa University has graduated seventeen Doctor of physiotherapist in 2017.



Picture 20: Ethiopian doctor of physiotherapist doing assessment

2.10.2 Being a Physiotherapist

Physiotherapy provides services to individuals and populations to develop, maintain, and restore maximum movement and functional ability throughout their lifespan. This includes providing services in circumstances where movement and function are threatened by aging, injury, pain, diseases, disorders, conditions or environmental factors. Functional movement is central to what it means to be healthy.

Physiotherapy is concerned with identifying and maximizing quality of life and movement potential within the spheres of promotion, prevention, treatment/intervention, and rehabilitation. This encompasses physical, psychological, emotional, and social wellbeing.

Physiotherapy involves the interaction between the physiotherapist, patients/clients, other health professionals, families, care-givers and communities in a process where movement

potential is assessed and goals are agreed upon using knowledge and skills unique to physical therapists.

Physiotherapy 'uses physical approaches to maintain and restore physical, psychological and social well- being' (British Chartered Society of Physiotherapy). It reduces physical impairment wherever possible, but where this is not possible, it enables individuals to manage their impairment in such a way that they are able to function as normally as possible.

In general, physiotherapy is a primary care, autonomous, client-focused health profession dedicated to improving quality of life by:

- Promoting optimal mobility, physical activity and overall health and wellness;
- Preventing disease, injury, and disability;
- Managing acute and chronic conditions, activity limitations, and participation restrictions;
- Improving and maintaining optimal functional independence and physical performance;
- Rehabilitating injury and the effects of disease or disability with therapeutic exercise programs and other interventions; and
- Educating and planning maintenance and support programs to prevent re-occurrence, re-injury or functional decline.

2.10.3 Core Competencies in Physiotherapy

A. Physiotherapy Practice

- Provide physiotherapeutic care and management of patients with cardiac , respiratory conditions, neurological problems, oncology related conditions, pediatric conditions, geriatric conditions, intensive care unit, orthopedics and trauma conditions, prosthetics, orthotics and mobility aids, gynecological and obstetrics conditions, and sport related injuries,

- Provide physiotherapeutic care and management of extremity musculoskeletal disorders
- Prescribe appropriate exercise program to prevent, cure and rehabilitate individuals with different health problems
- Analyze movement s of the human body to identify motor dysfunction
- Operate different electrotherapy and physical modalities to apply on patients for therapeutic and pain management purposes
- Perform physiotherapeutic care using of Virtual Reality Technologies



Picture 21: Kid on tilting table *(left) and casting for club foot kid* (Right)

B. Counselor

- Counsel the clients and community with regard to existing physical related conditions

C. Professionalism

- Communicate professionally with patient, patient's family and health care teams working within the health system
- Take responsibility and accountability for his/her behaviors and actions
- Adhere to ethical principles and legal practices
- Provide care in compassionate and respectful manner
- Demonstrate commitment to enhance autonomy, continues self-competence improvement, and others

D. Population Health and Health Systems

- Conduct physiotherapy related community assessment, diagnosis and design interventions
- Provide promotion and prevention service related to physiotherapy conditions at different level and setting
- Participate and engaged in health system development

E. Educator/teacher

- Plan and facilitate physiotherapy education and trainings
- Monitor and evaluate students' performance
- Participate in designing and developing teaching learning materials including curriculum
- Participate in educational quality assurance and improvement activities

F. Leadership and Management

- Manage people and other resources to accomplish mission and improve organizational performance related to physiotherapy interventions

G. Researcher and Scholar

- Involve in research studies to contribute for the further development of physiotherapy to solve community problems
- Use an evidence-informed approach in practice

2.10.4 Professional Career

Physiotherapy professionals can develop their professional carrier vertically and horizontally.

Vertical careers are available with regard to education through attending different programs currently in the country Ethiopia.

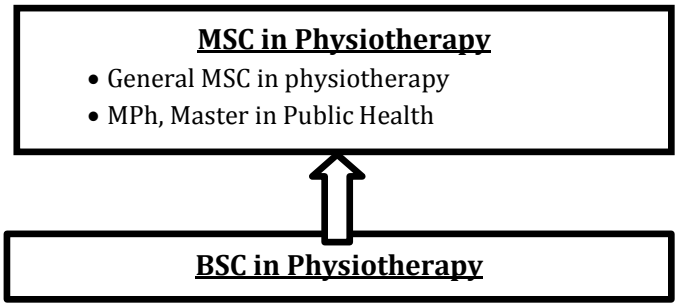


Figure 16: Professional career development of physiotherapy

In the In the future, career path development opportunities may increase, but globally different career path development opportunities and sub specialty programs are available. For instances global MSc programs include Orthopedic and traumatology, Musculoskeletal physiotherapy, Neurological physiotherapy, Pediatrics physiotherapy, Cardiopulmonary physiotherapy, Sport physiotherapy, Geriatrics physiotherapy, Women's' health physiotherapy and Occupational physiotherapy. There are also PhD programs. In addition, you can search more evidences in the World and consult the Association and appropriate professionals.

2.10.5 Opportunities and Challenges of being a Physiotherapist

A. Opportunities of being a Physiotherapist

- Gives great internal satisfaction by helping people and change their lives for the better.
- Physiotherapists can work in hospitals, universities, community based rehabilitation centers, specialized rehabilitation centers, sport and fitness facilities, privet practices, home health agencies, NGOs, etc
- Great demand nationally and internationally
- Can start your own practice (Be an entrepreneur): -
- Different specialties along professional development career up to PhD level internationally

A. Challenges of being Physiotherapist

- Poor infrastructure to strengthen physiotherapy service in the country.
- There is no subspecialty MSc and PhD programs in the country, Ethiopia
- Less awareness about the physiotherapy profession among other health care professionals and the general population at large
- Shortage of materials to practice the profession

2.10.6 Things to be considered before Choosing Physiotherapy Profession

- Have I Commitment to study long hours?
- Have I commitment to work with people with disability?
- Can I improve my professional competency continuously with new evidences?
- Can I listen and respond to client/staff/student concerns appropriately?
- Can I respect personal values and having compassionate nature considering patients as my primary concern while providing physiotherapy services?
- Can I assist clients to make informed choices and respect their decisions?
- Can I identify ethical issues and take action to resolve them to protect the privacy and confidentiality of client information?
- Can I maintain my own physical, psychological and emotional fitness to assist disabled clients?

2.11 Psychiatry Profession

2.11.1 History and Development of Psychiatry/Mental health profession

The evidences showed that **psychiatry/**mental health care was started during World War II, with some of this growth being stimulated by the Community of Mental Health Centers Act of 1963. This act, which "established funding for the development of community based mental health care programs with interdisciplinary teams" (Weikel & Palmo, 1989, p. 8), contributed to increasing the number of master's level practitioners. Currently in worldwide, mental health is expanded in terms of services and number of professionals serving on mental health care.




Picture 22: Picture of mental health providers with client

In Ethiopia the formal education program, was started in recent time, previously mental illness was treated by religious people and traditional healers using holy water, various plants and herbs.

Until 1987, Amanuel Hospital and the department of psychiatry at St. Paul's Hospital millennium medical college were the only institutions that were used to give this service to the entire country and there were only two indigenous psychiatrists and one psychiatric nurse until that time.

Diploma training program in post basic psychiatric nurses was started in 1987 and few doctors were sent aboard for postgraduate training in psychiatry.Bachelor science degree in Psychiatric profession in Ethiopia started in 2012 at University of Gondar with collaboration of Leister Gondar link, university of leister, which is found at England. The program has both bachelor degree Generic and advance undergraduate program in psychiatry and post graduate program in integrated clinical and community Mental Health (ICCMH).

2.11.2 Being a Psychiatric Profession

According to the WHO, a mental health professional is defined as a health care practitioner or social and human services provider who offers services for the purpose of improving an individual's mental health or to treat mental disorders. Most of the time, we used interchangeably psychiatry professionals with mental health professionals. Some of the practice of mental health professionals includes:-Conduct a diagnostic interview including history taking, physical examination and neurological examination and mental status, Initiates, monitors and discontinues psychopharmacologies using evidence based practices, Assesses the mental health needs of a community by conducting appropriate research and Demonstrates an enduring commitment to maximize the function and wellbeing of the patient

2.11.3 Core Competencies in Mental Health Professionals

Psychiatric professionals are experts in provision of comprehensive clinical care for patients with mental problems through conducting proper health assessment, providing medication and therapy, and assistance to patients. Core competencies include:

- **Clinician:** The mental health professionals provide holistic clinical services, cultural appropriate and client-centered care that recognizes individuals' preferences, values and needs in, compassionate, respectful, effective ways.
- **Communicator:** are well prepared to provide community level mental health services through conducting health promotion, disease prevention and rehabilitation of patients.

- **Teacher/educator**: has required knowledge, attitude and skill on planning and facilitating teaching, designing and developing instructional materials including psychiatric professional's curriculum that enable students to effectively participate and contribute in curriculum development, teaching-learning.
- **Counselor**: help clients to recognize and cope with stressful psychological or social problem, to improve interpersonal relationships and promote mental health well being.
- **Manager:** are expected to work as a team leader, change agent, resource mobilize, conflict manager, patient advocator, planner and mentor for the wellbeing of clients, rapid recovery, independence and safety through efficient use of scarce resources and instituting a continuous performance improvement process.
- **Researcher**: are expected to participate in designing and conducting an operational health research targeted to mental health policy, practice and education. Psychiatric professionals are expected to report and disseminate findings of the research. Psychiatric professionals will look for local and global evidences to improve their practices.

2.11.4 Professional Carrier

Psychiatric professionals can develop their professional career either vertically or horizontally with regard to education through attending different programs both in the country Ethiopia and abroad.

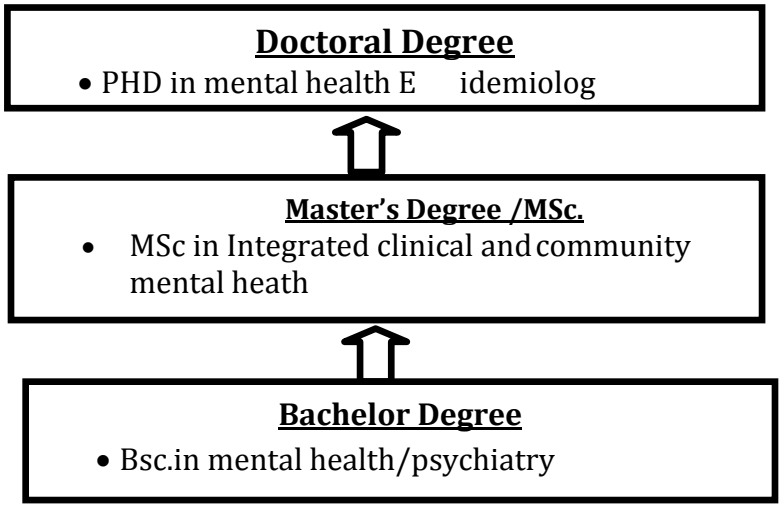


Figure 17: Professional career development of *Mental health professionals'*

2.13.5. Opportunities and Challenges of being Mental Health Profession

A. Opportunities of being mental health Profession

- Best careers to help people with mental illness
- Working with people of all ages, and help patients work through many stresses and problems of life.
- There are many excellent career paths to assist people with mental illness
- After you become licensed in mental health, you can go in many directions in your professional development career up to PhD level.
- You can also work in many different departments within the organization like internal medicine, surgery, gynecology and obstetrics etc.

B. Challenges of being mental health profession

Mental health practitioners have to face many challenges such as-

- Being in a highly stressful job which requires dealing with trauma and suffering of others which can cause the mental health provider to absorb the stress of client's frequently.
- Almost all mentally ill people may need adequate time to share their feeling and the problem what they have. Due to high flow of patient, the mental health provider may not give the expected time. This may lead to professional burn out and clients' dissatisfaction.
- They have to work at additional hours (including lunch time and weekends) according to when the client is available for therapy.
- The clients might misbehave with the mental health provider due to the nature of the disease
- Lack of community awareness regarding mental illness majority of the community has no trust on the treatment.

2.13.6. Things to be considered Before Choosing Mental Health Profession

- Am I Physically, Medically and mentally fit to practice mental health?
- Have I Commitment to study long hours?
- Have I commitment to work public holidays, overnight and weekends?
- Have I commitment to work if assigned in remote rural areas?
- Can I share my mental health knowledge with patients, colleagues, students and others?
- Can I improve my professional competency continuously with new evidences?
- Can I listen and respond to client/staff/student concerns appropriately?
- Can I respect personal values and having compassionate nature considering patients as my primary concern while providing physiotherapy services?
- Can I assist clients to make informed choices and respect their decisions?
- Can I identify ethical issues and take action to resolve them to protect the privacy and confidentiality of client information?
- Can I maintain my own physical, psychological and emotional fitness to practice?
- Can I manage personal stress effectively in the workplace?

2.14. Public Health Officer

2.14.1. Historical Background of Public Health Officer

Health officer program was started before the World War II in different parts of the world with different names, and in Ethiopia, Public Health officer training began in 1954. This was the first degree program in health professional training at the then College of Public Health in Gondar The college was established in order to meet the need for health professionals to work in rural communities, which constitutes the largest part of our population. Accordingly, public health officers made an enormous contribution for many years, providing comprehensive services to the community at large.

When the College of Public Health was transformed into Gondar College of Medical Sciences and started training medical doctors, the public health training ceased (1973-1995). Subsequently, some of the Public health officers joined medical school to become physicians; others followed the stream of public health to the MPH or PhD level; and a few remained as Public health officers doing primarily public health administrative work.

However, since the demand for public health professionals could not be met with the scarce number of health professionals, about 20 years after the cessation of the Public health officer training, the Federal Ministry of Health restarted the program at five centers in the country. Currently, the program is being run in most Ethiopian Universities. In 1996 E.C, there were 50 public health professionals in Ethiopia; and in 2000 this number has increased nearly to 500. Currently, there are around 9224 Public health officer graduates, and the number is expected to increase to 18936 by 2025 according to Ethiopian HRH Strategy.

2.14.2. Being a Public Health Professional

Public health officers are professionals who undertake promotive, preventive, curative and rehabilitative services in all health care facilities in general and in primary health units in particular, including management and implementation of PHC services compatible to the needs of the population.

So In response to the public‘s high demand for health care to improve the coverage and quality of health care specially in the primary health care units, the condition necessitates a comparable working-knowledge, skills and expertise of both clinical and public health disciplines/care (curative, preventive) as a Public health officer. More over Health officer as a profession means a profession which really possible to implement prevention is better than cure.



Picture 23: Public health officer during clinical practice

2.14.3. Core competency

A graduate Public Health Officer Professional will be expected to play the following competencies:

- **As a public health expert**-A profession working for preventing disease, prolonging life and promoting human health through organized efforts and informed choices of society, organizations, public and private, communities and individuals. Analyzing the health of a population and the threats it faces is the basis for public health.

- **As a clinician**-A health professional who is supposed to be involved in quality of medical care, diagnosing, treating and rehabilitating patients or take medical history, undertake physical examination and order clinical/lab, investigations for clients/patients and make a diagnosis to identify a disease, disorder or medical condition and treat accordingly.

- **AS a leader/manager -** develops a vision of equitable health care system and, in collaboration with other health care leaders and stake holders takes responsibility for bringing change to move the system towards the achievement of that vision and community benefit. He/she takes a leadership and managerial role and contributes for the development of profession, coordinates and participates as a leader in the prevention and control of both communicable and non-communicable diseases and plans, organizes, directs, supervises, monitors and evaluates health service delivery.

- **As a scholar and researcher:** A health officer is a health professional who is to be involved in improving services based on scientific evidences. He/she involves in teaching learning process, training, and curriculum development for health science disciplines and undertakes scientific and operational health research and involves in data management process.

2.14.4. Professional career

Once the Public Health Officer has obtained his/her BSc degree, he/she can pursue Masters Degree and PhD as indicated below: Moreover, the association currently developed generic roadmap of the professio0n which encompass wide and clear clinical and public health careers including Doctor of public health (Dr.PH) and Doctor of family health (Dr.FH)

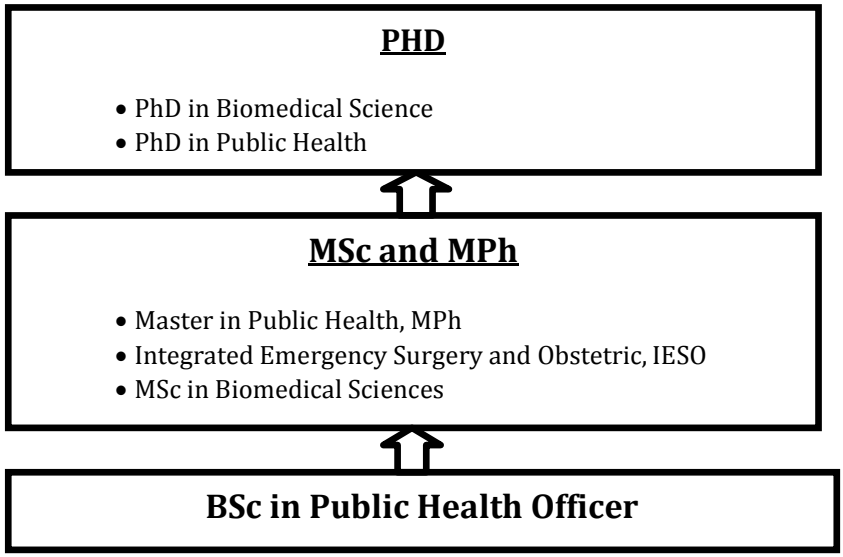


Figure 18: Professional career development of *health officers*

2.14.5. Opportunities and Challenges of Being Public Health Officer

A. Opportunities

- Professional satisfaction
- Endorsement of new roadmap which will enable to have different new carrier paths
- Expansion of universities and health facilities
- Supportive health policy
- Governmental and non-governmental organizations' focus
- Have options to work in governmental and non-governmental organizations
- Community and clinical based new harmonized curriculum
- Able to work both in rural and urban areas
- Good community attitude towards public health professionals

B. Challenges

- There may be different competing interests with other health professionals in universities
- The courses may take too much time so the students will be busy
- In some of the community practices, community may be exhausted because of the students' frequent visit to the community
- deployment to remote area
- May confront with very critical cases which need specialized consultant
- Lack of infrastructure

2.14.6. Things to consider before choosing public health officer as your career

- Interest to help others
- Interest to empathize the problems of others
- Able to work in a difficult situation such as remote area; and in high workload
- Communication ability
- Able to practice compassionate respectful and caring health care service
- Able to work with the community
- Able to practice surgical procedures
- Able to share knowledge to others
- Ability to work with other sectors; such as education, agriculture, media... Etc.
- Engagement in data collection, compilation, analysis and other research works
- Respecting other professions and ability to be engaged in teamwork
- Able to work with minimum incentive packages
- Have strong high school background in Biology, Chemistry and English language.

























Summary

Healthcare professionals have a tremendous obligation. “The most important thing is that healthcare professionals have higher standards than most professions because they are dealing with the dignity of patients and their ability to be healed.” (Dr. Robert J. Wolff, Ph.D., program director of Health Science at South University, Columbia)

Health is not only a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity; but also it is extended to include the ability to lead a socially acceptable and economically productive life. Hence, it should be integrated into all stages of programs and projects, from planning to impact assessment. The Ethiopian Health service delivery, therefore, is structured with a three-tier system; primary, secondary and tertiary level of care across the Federal, Regional and City Administration levels.

Accordingly, Ethiopia has implemented successive Health Sector Development Plans (HSDPs) since 1997 in four phases. During this period, our country has made huge strides in improving access to health services and improvements in health outcomes. Despite major steps to improve the health of the population in the last two decades, Ethiopia's population still face a high rate of illness and death.

While considerable health gains have been achieved in the provision of our healthcare system, including human resource development, there is growing concern about the perceived lack of compassion in its delivery. Compassionate and Respectful Care (CRC) is critical to building a sustainable, equitable and healthy future for all.

Bibliography

Abdurrahman Ali, 2011. *The History of Nursing in Ethiopia,* Nursing History Review

Alemayehu Mekonnen, ----- *pharmacists' journey to clinical pharmacy practice in Ethiopia*: key informants' perspective.

Amsale Cherie, Hussen Mekonen and Tsehay Shimelse, 2006. *Introduction to Professional Nursing and Ethics; Addis Ababa University In collaboration with the Ethiopia Public Health Training Initiative*, The Carter Center, the Ethiopia Ministry of Health, and the Ethiopia Ministry of Education

Annette Maree, 2014. *A model for direct-entry midwifery education and deployment in Ethiopia: Transforming rural communities and health care to save lives:* Bennett Faculty of Health University of Technology, Sydney.

Beedemariam G, Gedefi T, 2013. a*ssessment of pharmacy workforce in Ethiopia.* Eth J health develop,

Bethabile Lovely Dolamo and S.K. Olubiyi, 2013. *Nursing education in Africa: South Africa, Nigeria, and Ethiopia experiences*. International Journal of Nursing and Midwifery. 5(2): p. 14-21.

Centers for Disease Control Foundation 2017. *"What is Public Health".* Atlanta, GA: Centers for Disease Control. Retrieved 27 January

Curriculum for bachelor of science in environment and occupational and safety program University of Gondar and Jimma University; August,2017

David A. Goss, O.D. 2003,*History of Optometry Lectures in V578,* Public Health Policy and the Optometric Profession November 18 and 20,

David A. Goss, 2003... History of Optometry Lectures in V578, Public Health Policy and the Optometric Profession November 18 and 20,

David E. Longnecker, 2008. Anesthesiology,

EDHS, 2016. Et*hiopian Demographic and Health Survey*

EMwA, 2013. *Engagement in Maternal and Child health,* copy write

Ethiopian environmental health professional association, 2010. *five-year strategic plan*

European Science Foundation, 2007. *Medical Imaging for Improved Patient Care*: SCIENCE POLICY BRIEFING.

FMoH, 2017, *national HRH strategic plan 2017;* Note: there are other professions not included in the graph.

Growth and Transformation Plan (GTP II 2015/16-2019/20)

Harmonized public health officer curriculum, Ministry of Education, 2015

Hawassa University and university of Gondar, 2014., *Harmonized BSc optometry curriculum, department of optometry,*

Jennifer JP, Farai C, Alice G, Devan P, Samantha F, Jyoti J, et al, 2014. Trends and *implications for achieving VISION 2020 human resources for eye health targets in 16 countries* of sub-Saharan Africa by the year 2020.

Jimma Institute of Health Sciences (JIHS), 1996. *Manual for Student Research Project*, Department of Community Health JIHS; 1 – 71

Jimma: Jimma Institute of Health Sciences, 1981; *Community – based Training Program Manual part II* 1-25Department of Community Health

Kirsty Bourret, RM, BSc, BHSc, MHScBioethics Barbara Kemény, RM, CMQ, DMG, 2015.*Ethical Issues in the Practice of Midwifery*

Kitaw Y., Teka GE and Hailu Meche, 2005. *The evolution of public health in Ethiopia*

Kotlarz VR, 1998. *Tracing our roots:* early clinical laboratory scientists and their work myth and reality;11(4):209-213.

Kotlarz VR,1998. *Tracing our roots:* origins of clinical laboratory science.;11(1):5–7.

Midwifery harmonized curriculum, Ethiopia 2018.

Oz'anic', I. 1961. Nursing in Ethiopia:The Ethiopian Nurses Association, Addis Ababa.

P.G. Barash, Clinical Anesthesia, 8th edition.

Pankhurst, R. 1991. An Introduction to the Medical History of Ethiopia1991: Red Sea Pr (May).

Ruth M. Strud wick, 2014. *Day of Inter professional working in diagnostic radiography*

Satyam Prakash, ----Challenges towards quality improvement in medical laboratory service in Nepal

UNFPA, 2014. *Investing in Midwives* , Stories from Ethiopia,

Waheed U, Ansari MA, Zaheer HA, 2013. *Phlebotomy as the backbone of the laboratory.*;44(1):e69716. Satyam Prakash, Challenges towards quality improvement in medical laboratory service in Nepal

Watson, DM, R.T.(R)(M)(S)(BS), RDMS, RVT, FASRT and Teresa G. Odle, BA, ELS---- *Patient Safety and Quality in Medical Imaging*: The Radiologic Technologist's Role Liana, for The ASRT Foundation Health Care Industry Advisory Council Subcommittee on Patient Safety and Quality in Medical Imaging

Winslow, Charles-Edward Amory (1920). "The Untilled Field of Public Health". Modern Medicine. ***2*** *(1306): 183–*

World Health Organization 1950: Environmental Health Definition

www.britannica.come/science/pharmacy, accessed on 12 October 2019).

Yemane B, 2008. Prevalence and causes of blindness and Low Vision in Ethiopia. Ethiopian Journal of Health Development.

Yemane Berhane, 2008. *Prevalence and causes of blindness and Low Vision in Ethiopia,* Ethiopian Journal of Health Development, 21,

Additional references

Almata Declaration on Primary Health Care 1978

American optometry association report, June 2012.

BSc curriculum of anesthesia

Careers@amherst.edu.Loeb Center for Career Exploration and Planning, Self-Assessment for Career Planning Workbook,

Carl Gwinnett, Clinical Anesthesia Lecture Notes, 2nd edition.

Health Sector Transformation Plan (HSTP 2015/16-2019/20)

HSTP 2015-2015

Miller's Anesthesia, 8th edition, Volume 1.

MOH, Competency-Based Integrated Modular Curriculum for medical schools, 2017

MOH, Health Sector Transformation Plan, 2015-2020, 2015

Morgan and Mikhail's, Clinical Anesthesia, 6th edition.

MSc curriculum of anesthesia

National CRC Training Participant Manual
National harmonized modular curriculum for bachelor degree in pharmacy (B. Pharm), 2013
National Health Workforce Update, EFMOH, 2019
Nationally Harmonized Modular Curriculum for Bachelor of Science Degree in Environmental Haramaya University, 2014. *Health Science* (Fourth Round);
Nationally Harmonized Modular Curriculum for Medical Radiologic Technology (BSc) November 2013
Nationally Harmonized Modular Curriculum for Medical Radiologic Technology (BSc) 2018
New Revised National Harmonized curriculum of Nursing, 2018
pankrust history library/ethiopia historic quest for medicine).
Public health officer road map, 2019 (Unpublished)
Research Gate, Laboratory Medicine: Challenges and Opportunities
Revised BSc optometry curriculum, department of ophthalmology and optometry, Hawassa University, 2018.
Scope and Practice for Nurse Anesthesia Practice
The History of Ethiopian Medical Association, 1961-2015, 2015, AA
The metamorphosis of pharmacy education in Ethiopia the case of Mekelle University).
The state of Midwives around the World, 2011.
Traveling nurse midwife the gypsy nurse-midwife, January 2018.
http://www.moh.gov.et/ejcc/am/search/node?keys=Anesthesia
https://ascls.org/what-is-a-medical-laboratory-science-professional
https://en.wikipedia.org/wiki/Anesthesia
https://en.wikipedia.org/wiki/Medical_laboratory_scientist
https://www.bartleby.com/essay/Dark-Age-of-Nursing-P3CLRSA8CK8W
https://www.bccnp.ca › Practice Support › British Colombia College of Nursing Professionals/RN NP › Documents › Self-Assessment. Accessed date 03/10/2019.
https://www.darkintelligencegroup.com/tag/clinical-laboratory/
https://www.elsevier.com/connect/the-hidden-profession-that-saves-lives

https://www.futureofwowking.com the leadership and career blog (the site was visited on Oct
https://www.icn.ch/sites/default/files/inline-files/2012_ICN_Codeofethicsfornurses_%20eng.pdf.
Https://www.merriam-webster.com/dictionary/optometry and world council of optometry.
https://www.nursingworld.org/practice-policy/scope-of-practice/
https://www.nursingworld.org/practice-policy/workforce/what-is-nursing/.
International confederations of midwives Essential competencies for basic midwifery practice 2010 Revised 2013.

