



Received on 18 November 2022; received in revised form, 25 January 2023; accepted 27 May 2023; published 01 August 2023

DIFFERENT ROLES OF PHARMACISTS AS A HEALTH CARE PROFESSIONAL: A BRIEF REVIEW

Debgopal Ganguly, Sourav Jana, Mahafuz Sahana, Vivek Jana, Kingshuk Nandi, Hira Das* and Rajesh Ghosh

School of Pharmacy, Seacom Skills University, Bolpur, Birbhum - 731236, Bengal, India.

Keywords:

Pharmacists, Hospital pharmacist, Clinical pharmacist, research and development, Covid-19 pandemic

Correspondence to Author:

Mr. Hira Das

School of Pharmacy,
Seacom Skills University, Bolpur,
Birbhum - 731236, Bengal, India.

E-mail: hiradas3096@gmail.com

ABSTRACT: In terms of providing professional services, the pharmacy profession has expanded significantly and is now recognized as essential to the multidisciplinary delivery of health care. Because pharmacists are vital healthcare professionals who improve patient care and encourage wellness, their position in society's healthcare is crucial. Pharmacists are sometimes referred to as chemists and druggists in the medical field. Pharmacists work with medications and give accurate information about them. They also assist in the production, formulation, quality control, standardization, compounding and dispensing of various dosage forms so that they can be used to treat a variety of diseases. In the healthcare system, the pharmacist works in various ways, such as Research and Development (R&D) section, developing new drug formulations, and maintaining proper safety and toxicity of the drugs. The pharmacist is important for the frail elderly population in primary care. The role of pharmacists has been expanding around the Globe, in the present time, as an example the COVID-19 pandemic. In essence, pharmacists are essential to the health care system. The article helps identify pharmacists' various roles in different healthcare system fields to develop a healthier world.

INTRODUCTION:

History of Pharmacy: The history of Pharmacy is extensive. Around 50000 BC, medications made from plants with medical characteristics were discovered. The most well-known early pharmacists arrived around 400 BC. Pedanius Dioscorides wrote a five-volume treatise named during this time. The principal source for medieval pharmacological medicine in Europe is a book called "De Materia Medica," which translates to "concerning medicinal ingredients."

We have several Egyptian documents that date back to the pharaohs of ancient Egypt and up to the present¹. These include the 2000 BC Kahun Papyrus, which deals with veterinary medications of the time. The Kahun Papyrus contains references to 700 different medications. Today, most of these are used to prepare wine, beer, yeast, turpentine, vinegar and castor oil. 'Pharmacy' is the art and science of preparing and dispensing drugs and medicine.

While the term 'Pharmacy' has only been around since around 1645, the concept of prescriptions and mixing medicine for others dates back thousands of years. The father of Pharmacy all over the World is the Greek physician 'Galen'; in India 'Mahadeb Lal Schroff' is known as the father of Pharmacy². The pharmacy profession almost arrived in India at the same time as it did in the United States, but

<p>QUICK RESPONSE CODE</p> 	<p>DOI: 10.13040/IJPSR.0975-8232.14(8).3715-27</p>
<p>This article can be accessed online on www.ijpsr.com</p>	
<p>DOI link: http://doi.org/10.13040/IJPSR.0975-8232.14(8).3715-27</p>	

India's expansion was extremely gradual. Before B. Pharm courses were introduced in 1932 at Banaras Hindu University in Varanasi and in 1994 at Punjab University in Lahore, little progress had been made for over 50 years.

While the B. Pharm. program at Punjab University was focused on pharmaceutical practice, the BHU program was industry-oriented³. Although the profession first focused on pharmaceutical practice, it became increasingly industry-focused as it developed. This tendency resulted in the growth of the contemporary Indian pharmaceutical sector, currently ranked fourth by volume and fourteenth by value.

Rx Symbol: The Rx symbol, which appears on every prescription, is one of the emblems that connect the pharmacy profession with ancient mythology. Different uses of the "Rx" symbol have the same intensity. It represents safety, regal authority, and good health. We also think that the symbol's name is an acronym for the Latin word "recipe," which means "Take" (it or thou). It is the planet Jupiter's zodiac sign⁴.

Role of Pharmacists in Clinical Pharmacy:

Clinical Pharmacists: Hospital pharmacy is the field that works to consistently uphold and enhance patient pharmaceutical care and medication management to the highest standards possible in a hospital environment. Choosing, preparing, storing, compounding, and distributing medications and medical equipment and counseling patients, physicians, nurses, and other healthcare workers on using them safely, effectively, and efficiently are all part of hospital pharmacy, a healthcare service⁵. An integral aspect of patient care at a healthcare facility, hospital pharmacy is a specialist area of Pharmacy.

Clinical Pharmacist's Role: Clinical pharmacists are the pharmacists who provide patient care by providing information about medications, monitoring patient progress, and communicating with other healthcare professionals to optimize patient outcomes. There are so many types of platform in a clinic or hospital that cannot do work without pharmacists. Pharmacists are regularly involved in hospital work both indoors and outdoors⁶.

The Steps of Pharmacists in Indoor Area:

A. Central Dispensing Area:

- Pharmacists always confirm that all the drugs are dispensed correctly. The steps of taking medication perfectly always guided by the pharmacists.
- To check the accuracy of dosages prepared by remembering the patient's safety and ensuring that the medicines are prescribed and administered safely.
- The healthcare professional's role is to protect the public from that which cannot protect them. Pharmacists have a right to dispense only indicated medication orders for and administered to the patients. The items of all dispensed medicines should be noted on the bills of the patient in proper quantity.
- Good communication is always more important in the healthcare system than in any other field. A communication breakdown can cause serious patient issues. Communication with patients and pharmacists is a type of bridge over a river. Good communication always gives proper care and cure to the patients.⁷
- There are also important things for the clinical pharmacists: the perfect communication between the staff pharmacist and other healthcare professionals, the junior pharmacists, and the hospital's other staff.
- A big characteristic of a clinical pharmacist to make a Drug and Therapeutic Committee.

B. Patient Care Area:

- Pharmacist maintains simple and perfect communication with the nurses in the patient care area in a polite voice.
- Review the drug administration or the information on using the drugs.
- Screening, Monitoring and Maintenance of Patient care.
- Monitoring Drug therapy by auditing the prescription.
- Identification of the drugs which are delivered into the hospital⁸.

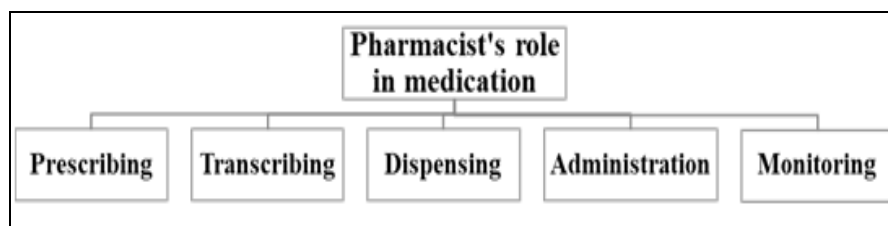


FIG. 1: ROLE OF PHARMACISTS IN MEDICATION

C. Direct Patient Area:

- Obtaining the history of the patient's medication.
- Assist the patient and his relatives with total drug therapy.
- Assist the physician in doing a better job of prescribing.
- Aware of the specific consideration such as pregnancy, blood sugar level, high blood pressure, heart disease, *etc.*
- Patient counseling.
- Checking the drug profile about checking duplication, interactions, and incompatibilities.
- Ensuring the short therapy medication such as antibiotics, analgesics, *etc.*⁹.

D. General Responsibilities:

- Ensuring the proper handling and storing of drugs.
- Provide education and proper training for pharmacists.
- Educate patients to maintain health through diet, exercise, *etc.*
- Keep records of incoming and outgoing drugs.
- Making of the Drug and Therapeutic Committee.

The Steps of Pharmacists in Outdoor Areas:**A. Central Dispensing Area:**

- Ensuring the correction of stored and dispersed drugs.
- Keep the pharmacy area neat and follow a tidy manner.

- Prepare and review proper records of medicines.
- Storing and obtaining vaccines or sera.
- Determining the specifications of required medicament.
- Maintenance for the manufacturing records¹⁰.

B. Patient Care Area:

- Identify the medicines imported into the clinic/hospital.
- Check the drug monitoring.
- Counsel the patients by providing them with advice, information, and medication assistance.
- Establish communication between doctors and administrative authorities.

C. Manufacturing Area:

- Collect the information regarding the hospital's demands.
- Selection and purchase of medicines depending on their demands.
- Manufacturing sterile and non-sterile products.
- To improve and maintain an effective institutional and administrative records and reports system.

D. General Responsibilities:

- Draw a plan for commanding the hospital pharmacy the administrator.
- Ensure the handling of all drugs in the hospital.
- Provide proper instruction and give training for the pharmacists, also for the trainee pharmacists.

- Coordinate overall pharmaceutical needs for outdoor services.

Functions of Hospital Pharmacists:

1. Delivering and assessing pharmaceutical services.
2. To create a framework for managing hospital pharmacies.
3. To develop communication between medical professionals and administrative authorities.
4. To determine the department's needs and implement the rules and processes for hiring sufficient and qualified employees.
5. To create and maintain an efficient system for keeping clinical and administrative data and reporting.

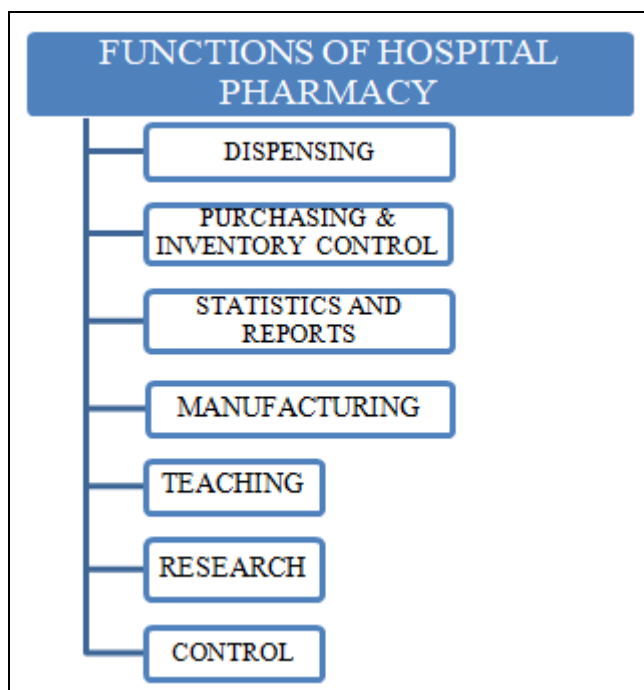


FIG. 2: FUNCTIONS OF HOSPITAL PHARMACY

Process of Patient Care by Pharmacists: To improve patient health and medication results, pharmacists work with other healthcare team members using a patient-centered approach.

Gather: To comprehend the patient's pertinent medical history and current clinical situation; the pharmacist ensures the gathering of essential subjective and objective information about the patient.

Evaluate: To detect and prioritize issues and provide the best possible care, the pharmacist evaluates the data gathered and analyses the clinical consequences of the patient's therapy in light of the patient's overall health goals.

Plan: The pharmacist creates a unique, patient-centered care plan that is evidence-based, affordable and developed in consultation with the patient or caregiver, other healthcare providers, and the patient.

Implement: The care plan is carried out in partnership with the patient or caregiver, other healthcare experts and the pharmacist.

Follow-up: Monitor and Evaluate: In consultation with other medical professionals and the patient or caregiver as necessary, the pharmacist monitors and assesses the efficacy of the care plan¹¹.

The Responsibilities of a Hospital Pharmacist:

1. Preparing and dispensing medications for both indoor and outdoor patient departments.
2. Production of medications. Take a tablet, capsule, or cream, for instance.
3. Injectable drug preparation and sterilizing.
4. Medicine containers are filled and labeled.
5. Narcotic medication should be dispensed properly.
6. Keeping track of narcotics-related records correctly.
7. Keeps an adequate supply of both emergency medicine and poison-resistance drugs.
8. Examine the suppliers' standards for purchasing all medicines, chemicals, antibiotics, biological products, and other pharmaceutical preparations.
9. Giving doctors, interns, nurses, and others detailed info on medicine
10. Keepers of the correct record-keeping system.

11. Maintaining oversight of all medication ordering and dispensing.
12. The organization and operation of the Pharmacy and therapeutic committee.
13. Engaging in collaborative teaching.
14. Execution of the pharmacy and therapeutics committee's judgment.
15. Creation of budgets, annual reports, periodic reports, etc.

Role of Pharmacists in the Industry:

Industrial Pharmacy: By definition, Industrial Pharmacy is a discipline that includes manufacturing, development, marketing, and distribution of drug products, including quality assurance of these activities. This broad area relates to different pharmaceutical industry functions from unit operation principles through pilot plant scale-up technique, technology development and transfer, and quality management systems to the regulatory aspect of dosage forms.

The pharmaceutical industry deals with the manufacturing process and develops and markets drugs licensed as medication. Pharmaceutical companies can deal in generic and brand medication. They are subject to various laws and regulations regarding drug patenting, testing, and marketing. It also deals with the manufacturing

process of those inventions using the approved standard practices. This includes technology transfer, total quality management, transport, distribution, and regulation¹².

Pharmacist Role: In addition to prescribing prescriptions and educating patients, a pharmacist's duties also include developing, testing, and creating new drugs. Pharmacists are involved in and in charge of many different industrial activities. Pharmacists work in the development of dosage forms, clinical trials, marketing, management and medication safety investigations. India is no exception to the rule that where there is a drug, there is a pharmacist. A pharmacy in the pharmaceutical sector covers an extensive range of topics. A few examples of things include formula regulation, research into new formulas, quality control, quality management and many other things¹³.

Pharmacists also work in the R&D department, which is responsible for developing new drugs and dosage forms for existing products. Nowadays, industrial pharmacists are involved in the research, design, development, and testing of contemporary medicine, ensuring their safety and quality. Pharmacists are also in charge of setting up manufacturing policies and controls to guarantee the creation of high-quality goods that adhere to exacting corporate and FDA standards.

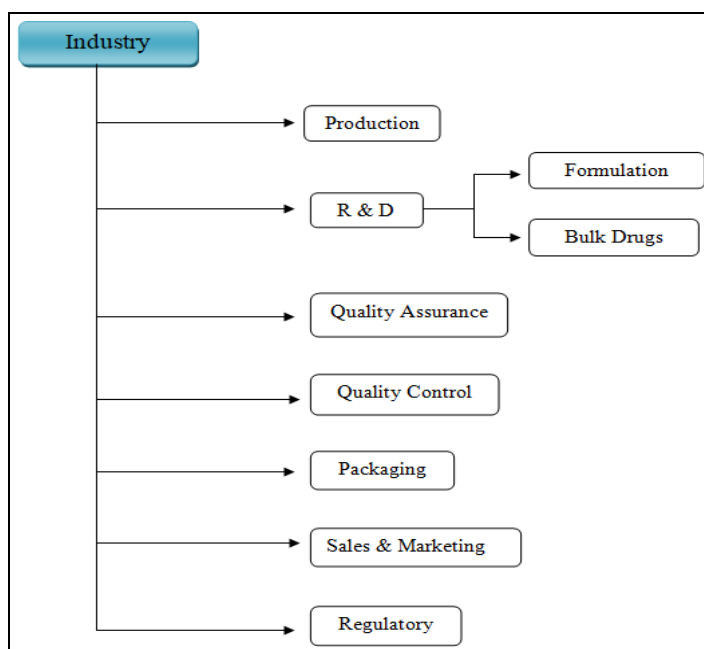


FIG. 3: DIFFERENT ROLES OF PHARMACISTS IN THE PHARMACEUTICAL INDUSTRY

The pharmacist finds, develops, produces, and sells pharmaceutical drugs used as treatments given to patients with effort. There are many well-known pharmaceutical companies, but most may deal in generic or brand medication and medical devices. There are many options in the pharmacy field, but at present most pharmacists choose the industrial

sector; there are several departments in which one can get better career opportunities¹⁴. There are lots of departments in the industry sector, such as drug selection, development, Manufacturing, Formulation development, evaluation, approval, sales, marketing, and also many others. Still, I am dividing them into two categories¹⁵.

R & D	Production
Formulation	Tablet
Quality assurance	Capsule
Quality control	Injection
Pharmacology	Cosmetics
Technology Transfer	Nutraceuticals
Regulatory Division	Syrup

FIG. 4: TWO MAIN CATEGORIES IN THE PHARMACEUTICAL INDUSTRY

Future of Industrial Pharmacy: According to Pharmaceutical Technology, a 2021 Global Data poll found that 70% of pharmaceutical sector clients believe that smart technologies like artificial intelligence, machine learning, and natural language processing will have the biggest impact on drug development in the future. In 3D printing, a type of additive manufacturing, a digital model is created using computer-aided design software.

Then a 3D object is produced using either liquid or powder raw materials. The pharmaceutical industry generates 1.2 trillion dollars in revenue annually. The pharmaceutical sector must embrace new technologies, patient design, and innovations and emphasize prevention more. Digital health is given the amount of money at stake and the speed of technological disruption¹⁶.

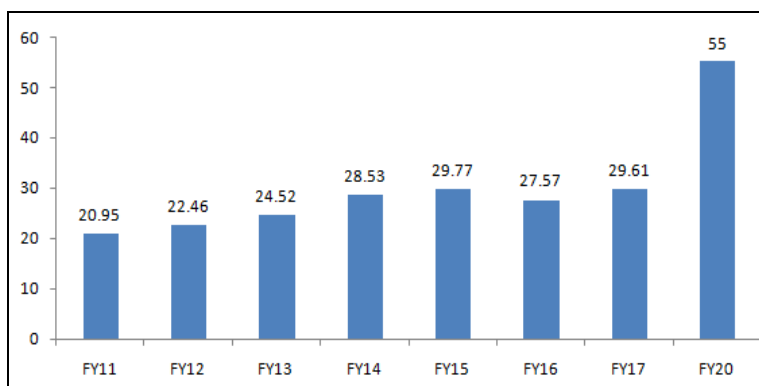


FIG. 5: REVENUE OF THE INDIAN PHARMACEUTICAL SECTOR

Role of Pharmacists in Research and Development: Pharmacists not only play a vital role in the pharmaceutical industry, hospital, and clinical Pharmacy but also play a vital role in the development of the drug in the research & development sector. Pharmacists involved forming the research and development of the drug to sell the drug to patients. First of all, we will be known about research and researcher.

Research: For one-word research is defined as a work for developing or gathering new information about a product or substance.

Researcher: A researcher is a person who has acquired knowledge, understands it, and then uses it to solve problems, gather new information and test new ideas and develop the substance or product¹⁷.

Public health safety is the fundamental motto of all medical practitioners. Day by day, public health safety is reducing due to a lack of trained healthcare professionals, a poor standard of education, inadequate health facilities, and misleading medicine, which impacts serious adverse effects on the patient. Adulterated, unlicensed, and spurious medicine are the major drawback of public health. According to a survey report, so many people die in a year due to the wrong medicine and the wrong understanding of prescription.

Pharmacists play the most important role in developing new drugs and therapies in the research & development unit. Pharmacists work so hard to ensure the new medication is safe and effective with scientists and other medical professionals.

We generally know a pharmacist as a chemist and druggist in the health care professionals who practice pharmacy deal with medicine and provide proper medication to the patient. And also related to the field of formulation, manufacturing, standardization, quality control & quality assurance, regulation, compounding, and dispensing of the drug in several types of dosage forms for easy administration in different routes for the treatment of local and chronic diseases. A pharmacist also plays a major role in acquiring knowledge and educating patients about their medication and how they use them safely and effectively¹⁸.

For pharmaceutical research, a new drug or therapy. The drug has to be developed in the clinical research section before releasing in the market. Chemists have huge knowledge and experience about the drug and have critical thinking abilities which can be used to develop new drugs and therapies. Within clinical research, the pharmacist assesses drug safety and drug efficacy.

Different healthcare professionals help Pharmacists to develop the entire clinical trial process, from planning the trial, composition, contraindications, and adverse effects, developing the first formulation for administration in animals, and later developing formulation in humans. After the animal's trial, if the drug has a safe therapeutics

response and performs well in trials, it is nominated to go into full-scale commercial production¹⁹.

And then, the drug goes through scale-up and technology transfer to one or more manufacturing sites for production, packing, labeling, and supply of the drug in a different warehouse. This is another area where many pharmacists are worked.

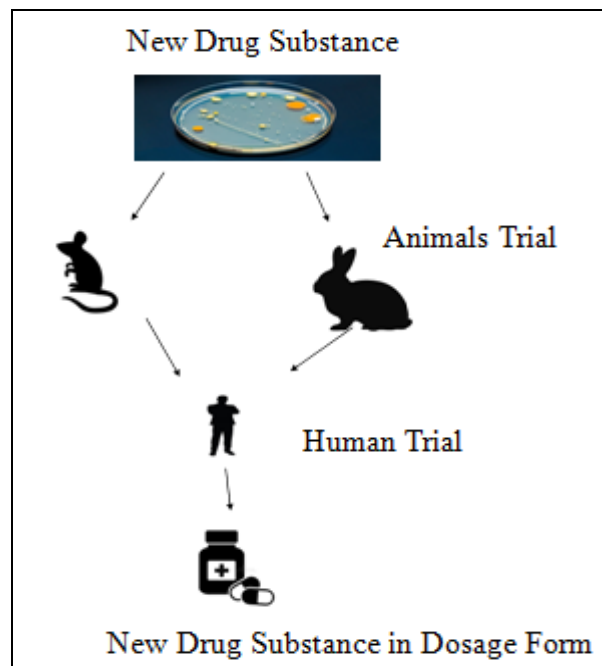


FIG. 6: DRUG DISCOVERY BY ANIMAL AND HUMAN TRIAL

Pharmacists do Research and Development in:

Pharmaceutical Chemistry	pharmacology	Toxicology
Microbiology	Biopharmaceutics	Nonclinical & clinical research
New drug application	Generic medicine	Patients compliance

Education Required to Work in Research & Development for a Pharmacist: A pharmacist in research and development should have specialized knowledge in new pharmaceutical drug design and therapies.

Generally, the specialized pharmacist works in a pharmaceutical production unit or a hospital research laboratory. To work in the research and development sector, one should have completed his/her high school education in the science division to study Pharmacy. A pharmacist must have completed a four-year bachelor of pharmacy program.

A master's degree in Pharmacy is the best way to go into research and development, Doctorate in pharmacy degree is the best way to work in research and development. As an academic

pharmacist in the pharmaceutical field, one can conduct research and work on developing pharmaceutical science with other medical professionals²⁰.

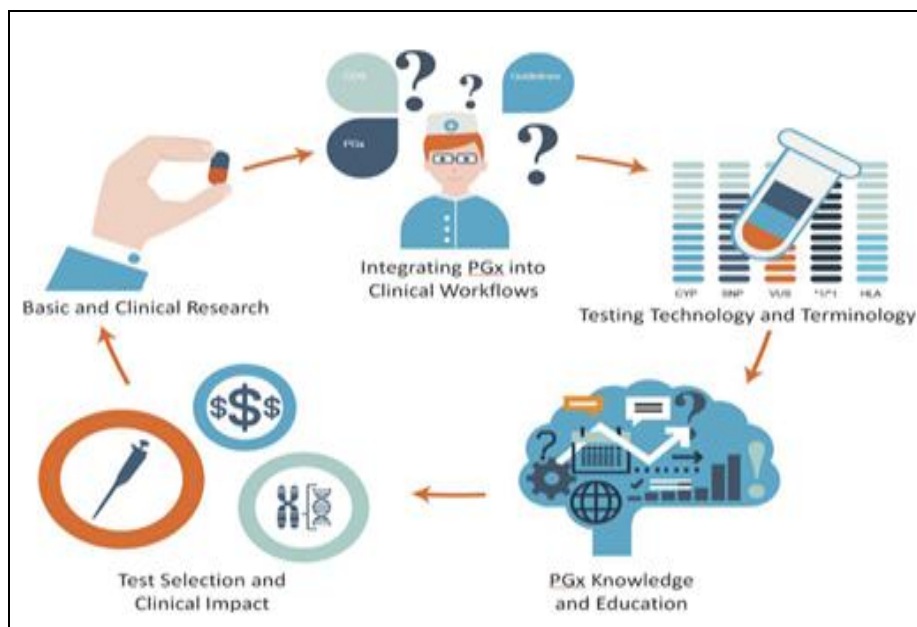


FIG. 7: DEVELOPING THE CLINICAL RESEARCH PROCESS

Common Experimental Research Design by the Pharmacist: There are many design strategies for experimental research. A few are described below

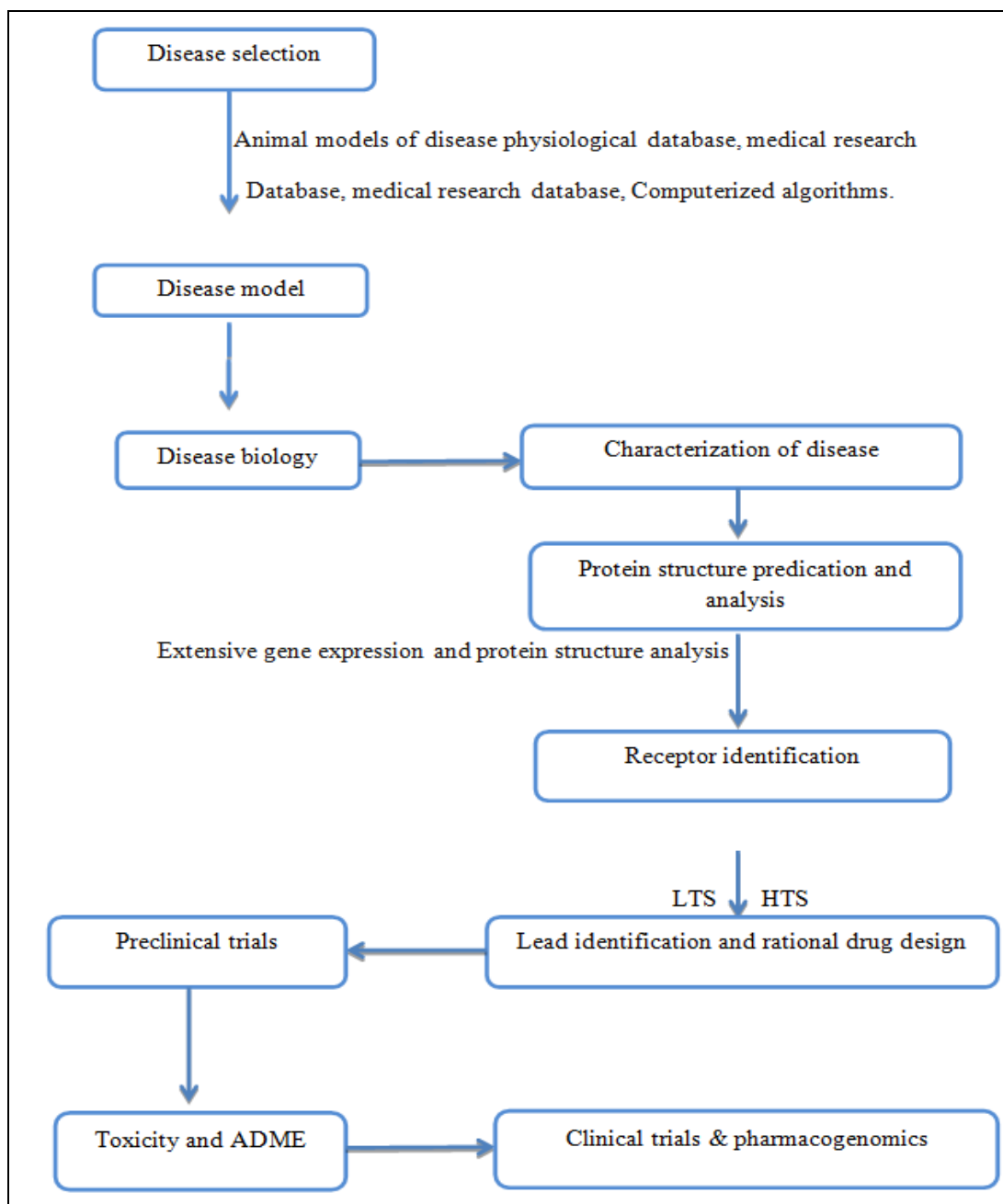
Post-test design: Two randomly assigned groups are created when pretesting isn't possible. Among these two-group treatment is done in one group. And both group is administered the post-test.

Pretest, Post-test design: Randomly created two groups one is a control group and should be the experimental group. Each group is pretested the test is done in the experimental group, and after that post-tested in both groups. It is a more useful design than a post-test design²¹.

Solomon's Four Group design: Four groups are randomly created: two experimental and two control groups. Only two groups are pretested. Treatment is done in one pretested group and another without the pretested. All four groups are post-tested. Then both of the previous test designs are combined, which helps to reduce errors.

Research and Developing Spending: In the pharmaceutical industry, the research and development unit cover a variety of activities. The spendings are:

- Invention, or research, discovering and developing of a new drug substance.
- Development of the new drug, or clinical testing, formulation, manufacturing and submission of application to FDA for approval of new drug design and arrangement of the production process for new drugs²².
- Incremental innovation, development of new dosage forms of the drug substance, and testing of that drug substance for an additional indication.
- Product differentiation, the new drug substances are clinically tested with the existing rival drug by the research and development section to show that the new drug is superior to the rival drug.
- Safety monitoring, or clinical trials (it is done after the dosage form of the new drug substance has reached the market).
- Identify the side effect, and adverse effects of drug interaction of the new drug that may not be observed in the trial time when the drug substance was in the developing section and these reports have to be submitted to FDA²³.

Drug Discovery and Development (DDD) Basic:**FIG. 8: DRUG DISCOVERY AND DEVELOPMENT**

From the above information, we can easily say that pharmacist has a huge role in discovering and developing new drug substance with other healthcare professionals in the research and development unit for developing a healthier world. The pharmacist can also make his/her career in the R&D section beyond dispensing prescriptions in drugs store²⁴.

Role of Pharmacist during Covid-19 pandemic: “COVID-19”, “CO” stands for corona. “VI” for the virus, “D” for disease. “19” for 2019 – the year it

was first identified. “COVID-19” is the name of the illness involving the severe acute respiratory syndrome coronavirus 2 (SARS-COV-2). COVID-19 was first discovered in the Chinese city of Wuhan in 2019 and was published as a pandemic by the World Health Organization (WHO)²⁵.

“COVID-19” SPREAD:- COVID-19 spreads capittally by droplets created as an outcome of coughing or blowing of a COVID-19 transited individual. This can occur in two ways:

Direct Close Contact: One can grow the transit by an entity in near contact with COVID-19 patients, particularly if they do not shroud their face when coughing or blowing.

Indirect Contact: The droplets stay on the rear and garment for many days. Hence, contact with any similar transited rear or garment and then contact with one's mouth, nose or eyes can send the illness.

The incubation season of COVID-19 (the period in the receipt of the transit and display of symptoms) is 1 to 14 days.

Many communities with the transit, but without any important symptoms, can also spread the illness²⁶.

Symptoms:

Most Common Symptoms:

1. Fever.
2. Coughs.
3. Slander.
4. Lose of taste or smell.

Less Common Symptoms:

1. Sore throat.
2. Headache.
3. Pain.
4. Diarrhea.
5. A rash on skin.
6. Red or resentful eyes.

Types of Pharmacists Based on Different Specialized Services:

1. Community pharmacist in covid-19.
2. Hospital pharmacist in covid-19.
3. Industrial pharmacist in covid-19.
4. Role of drug regulatory pharmacist in covid-19.
5. The future role of pharmacists in covid-19.
6. Role as frontline worrier pharmacist in covid-19.
7. Ambulatory care pharmacist in covid-19.
8. "Informatics pharmacist" in covid-19.
9. Home health and infusion pharmacist in covid-19.
10. Long-term care pharmacist in covid-19.
11. Specialty drug pharmacist in covid-19.
12. Oncology pharmacist in covid-19²⁷.

Community Pharmacists during Covid-19: Pharmacists constantly pass through the greater

portion of usual healthcare providers. It is especially right at the time of COVID-19. Community pharmacists are a central material of the work entity arrested versus the coronavirus 2019 inaugural. While various occupational have stopped their gate to patients, community pharmacists remained bare to the community malignancy stricter lockdown restrictions.

- Counseling the patients regarding the conduct of the drugs and dosage forms.
- Providing up-to-date reports on drugs \ and dosage forms to the patients and the medical staff²⁸.
- Community pharmacists constantly require observing patient registers and stories.
- Related in the conduct of one self-diagnostic kit by the patients for disorders kind as diabetes, hypertension, *etc.*
- Providing stocks of abode effort dosage forms.

Hospital Pharmacist in the Covid-19: The introduction of hospital pharmacists during the statewide is a further entity overlooked by the patient. This is a need for hospital pharmacists to agreement COVID-19 patients through emotive counseling and psychological support.

Industrial Pharmacist in Covid-19:

- A. Industrial pharmacist is part of COVID-19 research & development.
- B. Progressing entry to medicines.
- C. Power of indicated adverse drug reactions (ADRs).
- D. Urgency to comport with formal need²⁹.

Role of drug regulatory pharmacists in covid-19:

- A. Suitable medicine stocks.
- B. Make sure of Good selling practices (GSPs).
- C. Executive work versus secondary wholesalers.
- D. Irregular quality testing by Drug Testing Laboratories (DTLs).

E. Imperative work versus unrecorded medicine, sanitizer and penicillin.

F. Comfort operational obstacle ³⁰.

The Future Role of the Pharmacist in Covid-19:

Thus, pharmacists do agreement the eventual collaboration health care method in this pandemic.

Frontline Community Pharmacist:

- Approachable Hips.
- Clarify Misconceptions.
- Screen patients for COVID-19.
- Minor disease advice.
- Monitor and Manage in curable agreement.
- Telehealth services ³¹.
- Incurable medication renovation.

Frontline Hospital Pharmacist:

- Manage drug shortages.
- Medication experts.
- Antimicrobial stewardship accreditation.
- COVID-19 medication management.
- Develop treatment protocols ³².

When the vaccine versus COVID-19 is obtainable, pharmacists will be calculated as the frontline health workers that should be approved to send immunizations. Pharmacists must be central in administering COVID-19 vaccine to earn fast demography expensively.

Role as Frontline Warrior Pharmacist in Covid-19: Pharmacists ought to have consistently been calculated frontline workers, especially in COVID-19. The pharmacist is the highest obtainable medical care supplier and the rapid contact point of patient promise with the medical service system. Pharmacists are at the forefront of offering primary patient regard leads, dubbing the common helpful emergency in COVID-19. As a result, governments of almost the World, have employed pharmacists as a volunteer for frontline responders for COVID-19 patient care during the pandemic ³³.

Ambulatory Care Pharmacists in Covid-19:

There are ambulatory efforts of clinical pharmacists which grant COVID-19 training and triaging as well as pharmaceutical drug adjustment and assurance adjustment; pharmacist have rapidly qualified their practices to conduct telehealth

including video or telephone duet. This team would agreement mobile clinical pharmacy experience conferences are an imperious and continuous necessity to cut down on non-emergent care. The ambulatory action team also pushed forth knowledge toward how to vocation with COVID-19-related medication therapy.

Informatics Pharmacists in Covid-19: When there is an inversion, pharmacists can conduct their sense of drug management to ensure that people turn the right medicines and turn them fast. If you are a pharmacist, navel on conducting health actuality technology to help patients, you are mentioned as an "Informatics Pharmacist" ³⁴.

Home Health and Infusion Pharmacists in Covid-19: Home placing pharmacy services have the dynamic to spread a mark on pharmacy actions with a navel on adjustment of effort. This shows the gravity of marking pharmacists as the first line of fence versus the pandemic coronavirus illness 2019 (COVID-19). Here's how this crack occupation has qualified toward a road chart for constructing a home installation therapy worship line.

Long-term Care Pharmacists in Covid-19: Community in long-term effort facilities and topical health departments are receiving the COVID-19 vaccine to respond to them protected. The pharmacy fellowship for long-term care (LTC) project is in direction of the complete method, with chill chain management, on-site vaccinations, and reporting.

Speciality Drug Pharmacists in Covid-19: Pharmacists showed their application quickly after the appearance started. They qualified the grade pharmacy dispensing process greatly. Pharmacists were capable of placing a look on therapeutic drugs, which capable to placement look on therapeutic drugs, which was particularly better for anticoagulants. Many patients had to be in particular groups requiring particular drug dosages ³⁵. Telemonitoring lets pharmacists pay for pharmacological therapy and trade with the matter that arrives with treating COVID-19 patients. COVID-19 was published as a pandemic by the world health organization (who) in March (2020). To get over respecting what pharmacists consider

about how instructional institutions and the occupational club can aid them in accepting additional responsibilities during the COVID-19 pandemic, as well as what obstacles they express when it comes to receiving the attention of themselves and their patients. There was a metering of pharmacists and pharmacy students in Jordan during the appearance of COVID-19 (15-30 March 2020). Specialist pharmacists perform to aid the health care system save purses by losing the number of community who turn transit in their own homes.

Oncology Pharmacist in Covid-19: COVID-19 has involved extensive breakdown in healthcare delivery systems in almost the World, especially in the united states. Cancer patient care requires the taste of oncology pharmacists from all perspectives

CONCLUSION: A pharmacist is an integral part of the healthcare profession. They know to handle, prepare and dispense various medications. They are important in informing patients how to take or administer their drugs. Our main goal for this review is to collect information regarding the role of a pharmacist in different sectors, like community pharmacists and clinical pharmacists, and the role of pharmacists in the pharmaceutical industry. Community pharmacists generally work in community or retail pharmacies. They mostly dispense prescriptions and inform patients about their medications, diseases, over-the-counter drugs, etc. Clinical pharmacists are important in healthcare systems such as clinics, hospitals, or other locations that serve society. The pharmacists who work in the industry are involved in the research and development of new medications or other areas such as sales and marketing. Pharmacists associated with the research and development field find new chemical entities and develop them into dosage forms after performing different tests. Pharmacists act as a frontline warrior in the pandemic as healthcare professionals by working directly with the community, continuing to care for patients with chronic illnesses, working at hospital pharmacies, and providing pharmaceutical care to COVID-19 patients.

ACKNOWLEDGEMENT: Nil

CONFLICTS OF INTEREST: Nil

REFERENCES:

1. Nicola H: The global pharmacy work force: Systematic review of the literature. *Human Resource for Health* 2009; 7(48): 1478–4491.
2. Kumar AY, Kumar RV, Ahmad A, Mohanta GP and Manna PK: Pharmacists interventions and pharmaceutical care in an indian teaching hospital: A prospective study. *Int J Adv Res Pharm Bio* 2012; 1: 386–96.
3. Aziri B: Job Satisfaction: A Literature Review. *Management Research and Practice* 2011; 3(4): 77–86.
4. Armstrong M: A Hand book of Human resource Management Practice. Kogan Page Publishing, London, Tenth Edition 2006.
5. Kucukarslan SN, Peters M, Mlynarek M and Nafziger DA: Pharmacists on rounding teams reduce preventable adverse drug events in hospital general medicine units. *Arch Intern Med* 2003; 163(17): 2014–8.
6. Makowsky MJ, Schindel TJ, Rosenthal M, Campbell K, Tsuyuki RT and Madill HM: Collaboration between pharmacists, physicians and nurse practitioners: a qualitative investigation of working relationships in the inpatient medical setting. *J Interprof Care* 2009; 23(2): 169–84.
7. Farsaei S, Sabzghabae AM, Zargarzadeh AH and Amini M: Effect of pharmacist-led patient education on glycemic control of type 2 diabetics: a randomized controlled trial. *J Res Med Sci* 2011; 16(1): 43–9.
8. Access to Medicines and Health Products. The importance of pharmacovigilance [Internet]. Who.int. World Health Organization; 2002. [cited 2021 Sep 15]. Available from: <https://www.who.int/publications/i/item/10665-42493>.
9. Arulmani R, Rajendran SD and Suresh B: Adverse drug reaction monitoring in a secondary care hospital in South India. *Br J Clin Pharmacol* 2008; 65(2): 210–6.
10. Pharm D. New Delhi; 10th May: Ministry of Health and Family Welfare (Pharmacy Council of India); 2008. [Last cited on 2013 May 27]. Regulations. *The Gazette of India* 2008; 19(3)4: 1–97.
11. Chauhan N, Moin S, Pandey A, Mittal A and Bajaj U: Indian aspects of drug information resources and impact of drug information centre on community. *J Adv Pharm Technol Res* 2013; 4(2): 84–93.
12. Asiri and Yousif A: Emerging frontiers of pharmacy education in Saudi Arabia: the metamorphosis in the last fifty years. *Saudi Pharm J* 2011; 19: 1–8.
13. Atkinson, Jeffrey, Nicholson, Jane, Rombaut and Bart: Survey of pharmaceutical education in Europe, Pharmine – report on the integration of the industry component in pharmacy education and training. *EIP* 2012; 1: 3–7.
14. Bone A: The conference. The industry perspective – a widevariety of positions. *Pharmaceut J* 1999; 263: 647–648.
15. Doctor of Pharmacy Program Selected Survey Results (Data from 2012). <<http://cophs.mercer.edu/pdfs/academicpharmreports/SelectedSurveyResults2012.pdf>> (accessed 17.04.14).
16. Hasan SS, Kwai Chong, DW, Ahmadi K, Se WP, Hassali MA and Hata EM: Influences on Malaysian pharmacy students' career preferences. *Am J Pharm Educ* 2010; 74: 166.
17. Merz T and Fuller S: Elevated serum transaminase levels resulting from concomitant use of rosuvastatin and amiodarone. *Am J Health Syst Pharm* 2007; 64: 1818–21.

18. Kjekshus J: Rosuvastatin in older patients with systolic heartfailure. *N Engl J Med* 2007; 357: 2248-61.
19. Khan FY: Rosuvastatin induced rhabdomyolysis in a low riskpatient: a case report and review of the literature. *Curr Clin Pharmacol* 2009; 4: 1-3.
20. Karimi S: Results of a safety initiative for patients on concomitant amiodarone and simvastatin therapy in a veterans affairs medical center. *J Manag Care Pharm* 2010; 16: 472-81.
21. Alsheikh-Ali AA, Ambrose MS, Kurin JT and Karas RH: *Circulation* 2005; 111: 3051-7.
22. Goldman L and Ausiello D: editors. *Cecil Medicine. Ed 23rd Philadelphia: Saunders Elsevier* 2007.
23. Kostapanos MS: Rosuvastatin-associated adverse effects and drug-drug interactions in the clinical setting of dyslipidemia. *Am J Cardiovasc Drugs* 2010; 11-28.
24. Karch FE, Lasagna MD. Toward the operational identification of adverse drugs reactions. *Clin Pharmacol Ther* 1977; 21: 254-7.
25. Hua X, Gu M and Zeng F: Pharmacy administration and pharmaceutical care practice in a module hospital during the COVID-19 epidemic. *JAPAs* 2020; 60: 431-438.
26. Meng L, Qiu F and Sun S: Providing pharmacy services at cabin hospitals at the coronavirus epicenter in China. *Int J Clin Pharm* 2020; 42: 305-308.
27. Kapoor MC: Types of studies and research design. *Indian J Anaesth* 2016; 60: 626- 630.
28. Simpson SH: The roles we have as hospital pharmacists. *Can J Hosp Pharm* 2017; 70: 3-4. 29.
29. Chamoun N, Usta U and Karaoui LR: Current Trends in Hospital Pharmacy Practice in Lebanon. *Hosp Pharm* 2020; 55: 112-118.
30. Dalton K and Byrne S: Role of the pharmacist in reducing healthcare costs: current insights. *Integr Pharm Res Pract* 2017; 6: 37-46.
31. Pilkington EM: The role of the general practice pharmacist in health education and health maintenance. *Health Educ J* 1979; 37: 187-192.
32. Odedina FT, Warrick C and Vilme H: Pharmacists as health educators and risk communicators in the early detection of prostate cancer. *RSAP* 2008; 4: 59-66.
33. O'Loughlin J, Masson P and Déry V: The role of community pharmacists in health education and disease prevention: a survey of their interests and needs in relation to cardiovascular disease. *Prev Med* 1999; 28: 324-331.
34. Lively BT: The community pharmacist and health education. *Contemp Pharm Pract* 1982; 5: 14-20.
35. Shafiee Hanjani L, Caffery LJ and Freeman CR: A scoping review of the use and impact of telehealth medication reviews. *Res Social Adm Pharm* 2020; 16: 1140-1153.
36. Gupta V, Hincapie AL and Frausto S: Impact of a web-based intervention on the awareness of medication adherence. *Res Social Adm Pharm* 2016; 12: 926-936.

How to cite this article:

Ganguly D, Jana S, Sahana M, Jana V, Nandi K, Das H and Ghosh R: Different roles of pharmacists as a health care professional: a brief review. *Int J Pharm Sci & Res* 2023; 14(8): 3715-27. doi: 10.13040/IJPSR.0975-8232.14(8).3715-27.

All © 2023 are reserved by International Journal of Pharmaceutical Sciences and Research. This Journal licensed under a Creative Commons Attribution-NonCommercial-ShareAlike 3.0 Unported License.

This article can be downloaded to **Android OS** based mobile. Scan QR Code using Code/Bar Scanner from your mobile. (Scanners are available on Google Playstore)