

# Assessing Higher Education's Contribution to the Development of Pharmacy Practice in South Africa

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## Abstract

*South Africa experienced its most significant change in recent times in April 1994, when apartheid and race-based politics were abolished, bringing changes to the country's education, health care and the career opportunities offered to various groups of people. Since its establishment 28 years ago, the South African government has enforced reforms aimed at achieving a better balance between the rich and poor. Almost immediately, priority was given to the healthcare sector, with a focus on broadening access to services and building more primary health and hospital centers in places that lacked them. The changes are discussed generally in this paper, making specific mention of healthcare and pharmacy practice. The paper looks at modifications in the legal system, how pharmacists are trained and anything influencing drugstore practices in South Africa since 1994. It discusses important matters the profession faced over the past three decades and examines what may happen in the future for pharmacy practice and perspectives. It explores the main parts of pharmacy as practiced in South Africa now and the influence that training new professionals has on the pharmaceutical industry.*

**Keywords:** *Pharmacy education; pharmacy practice; pharmacy ownership; pharmacy workforce; rural.*

## 1. Introduction

Many people go to pharmacists today for advice on their health and their medical conditions, as they are considered very accessible members of the healthcare community. In earlier times, pharmacists went by the name of chemists and were mainly responsible for making up medications. It has slowly evolved from being centered around mixing drugs, to providing most medications in the form of products and today it is focused on providing care that considers patients' needs and affects positive results.

Nowadays, pharmacists are involved in several fields related to medicine by helping to use medicines wisely, assist in achieving better health results for patients and improve healthcare by partnering with other health professionals and public officials. Nowadays, the range of work pharmacists do allows them to be involved in community pharmacies, primary healthcare centers, universities and hospitals, contributing to the support of public health objectives at all these levels(1).

In the past, few people had access to pharmaceutical services in pre-democratic South Africa. Before democratic elections were held in 1994, most private pharmaceutical services were located in cities that were mostly inhabited by white South Africans. Unequal distribution of people and resources in the country meant that rural communities and communities that had faced disadvantages had significant trouble obtaining the medications and pharmacy assistance they needed.

After democratic elections in 1994, the South African government began working on a plan to tackle the serious problems in the healthcare system. This transition owes a lot to the passing of the Medicines and Related Substances Amendment Act and the Pharmacy Amendment Act. Because of these changes, pharmacy ownership was made open to everyone, not only to the original group of pharmacist proprietors. Its goal was to improve healthcare access for all by increasing the range of pharmacy operators and providing more chances to offer pharmaceutical services.

It was required by legislation that unless pharmaceutical services were closed, nurses and doctors could not provide patients with medications. While many accepted this major transformation, it caused a shift in the approach of hospital pharmacies, as more now aim to maximize profit from products instead of focusing on providing quality services.

As large companies have become owners of many pharmacy businesses, fewer independent pharmacies continue to provide the level of service and care they always did. Because advancement and recognition now focus mainly on speed and efficiency in pharmacy, many important pharmacy interventions may be regarded as unnecessary or

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ignored due to this shift(2). The main strength of the profession is moving away from the patient-centered approach that modern pharmacy practices are following worldwide.

South Africa's system is not the same as what exists in Chad, Senegal and Cameroon, since these countries focus on ensuring that only qualified pharmacists own and manage pharmacies. It is understood in these countries that pharmacists hold an important role in healthcare by providing valuable aid that is not primarily motivated by business gains. This model might ensure that pharmacists can still decide how to manage care while focusing on patients.

According to recent research conducted by Moodley and Suleman, allowing laypersons to own pharmacies in South Africa did not lead to a substantial rise in the availability of pharmacies for those living in disadvantaged and rural areas. Even with liberalization, most pharmacies were present in urban cities, as the study found only 1.88 pharmacies per 100,000 people.

Since 2003, the National Department of Health (NDoH) has placed restrictions to prevent overprovision of community pharmacies in specific areas. However, each area has a rule that dispensing stations must be at least 500 meters from each other and only 2 community pharmacies per 10,000 people are allowed, although these rules are not always followed. They support the World Health Organization's guidelines for achieving healthcare access equality.

The WHO relies on the Tanahashi model of effective coverage to represent access to health services in terms of availability coverage, accessibility coverage, acceptability coverage and contact coverage. A highly effective policy covers those people needing healthcare services and gives them beneficial results from treatment. One measure the WHO pays attention to is the number of public and private healthcare services per 10,000 people(3).

Their research concluded that only two South African provinces have at least 1 community pharmacy for every 10,000 people. Because maldistribution is still common, even with more corporate pharmacies and hospitals, action by policymakers is still required to ensure that all areas receive the same access to pharmaceutical services.

Pharmacy practices in post-apartheid South Africa have changed through many updates, for example changes to the Medicines and Related Substances Act 101 of 1965, Pharmacy Act of 1974, as well as the compliance of the National Consumer Protection Act of 2008 and regulations introduced in 2013 for supplementary medicines enrollment. They have changed the way pharmaceuticals are provided and used financially.

In 2004, the Single Exit Price (SEP) legislation was enacted to limit how much pharmaceutical companies could charge for their medications. Due to these changes, along with freedom to own and more rights for other healthcare professionals, private sector community pharmacies are now facing serious risks and have to adapt and find new ways to serve their patients.

## **2. Legislative Framework and Pharmacy Education**

Progress in the system related to laws and policies

Since 1994, legislation has made many changes to how pharmacies operate in South Africa. Significant changes have been made to the Medicines and Related Substances Act 101 of 1965 and the Pharmacy Act of 1974, as well as the new National Consumer Protection Act 68 of 2008 and the guidelines for registering complementary medicines in 2013.

In 2002, lawmakers vastly improved the Medicines and Allied Substances Control Act to help with the government's goal of higher medication access. The system set in place has controls for producing, importing, distributing and selling medicines(4). Remarkably, they loosened restrictions on patents and allowed generic drugs to be used which had a big impact on pharmaceutical companies. The price committees are also tasked with organizing a transparent pricing process for all medicines available in South Africa.

When the amendments were first introduced in 1997, many people were against them and the case continued in court until 2005. The main conflict related to judging the legal standing of the pricing committee and the guidelines on pricing for medicines and scheduled substances. Decisions on these matters built the current framework for how drugs are regulated.

There are too many pharmacies in cities compared to the people who need them. This newly proposed approach asserts that in the long run, unsuccessful pharmacies will eliminate themselves and the rest will increase their volumes so their earnings rise. By employing this approach, the industry has shifted away from controlled ways of

distributing products(5).

FIP has strongly recommended that primary healthcare centers in developing nations benefit from pharmacist-provided care. The organization admits that a lot of pharmacists and pharmacies cluster in urban locations in developing countries because of their convenient access to services and infrastructure. This situation where regions have different access to care occurs widely in numerous developing countries.

### **Education for those who will become pharmacists**

The SAPC is responsible for regulating all pharmacists and pharmacies in South Africa. The authority to license pharmacies was given to the National Department of Health by The Regulations Relating to the Ownership and Licensing of Pharmacies publication in Notice No. 553 on April 25, 2003. Pharmacies in the community must complete the registration process with the SAPC yearly.

There have been significant changes to education in South Africa, much like healthcare. In 1997, the White Paper and in 2001, the National Plan for Education argued for updating the curriculum and using teaching approaches that support all types of students.

The SAPC has the task of setting entry-level rules for pharmacists and overseeing the curriculum for training undergraduate pharmacists. Using these standards, universities can develop their Bachelor of Pharmacy programs to ready the graduates for many different types of careers. In 2017, the SAPC released the Good Pharmacy Education Standards (GPE), making it mandatory to meet higher education standards in Section 3.4 of the Pharmacy Act.

The eight-star pharmacist idea comes from the International Pharmaceutical Federation's policy on good pharmacy education practice, made in cooperation with the World Health Organization and is aligned with the exit-level outcomes of the BPharm(6). According to the standards, students are expected to show achievements in multiple subject areas.

1. Using and blending established knowledge of chemistry, microbiology, biochemistry, mathematics, physics, physiology, pathophysiology and social/behavioral sciences into pharmaceutical sciences
2. Integrated learning in product development and formulation is applied to the steps of compounding, manufacturing, distribution and dispensing.
3. Medication is prepared safely and according to the recommendations of Good Pharmacy Practice, Good Manufacturing Practice and Good Clinical Practice.
4. Ability to manage production, packaging, registration and development of pharmaceutical drugs
5. Managing the process from choosing drugs to disposing of them
6. Medicines are dispensed efficiently and effectively for everyone's pharmaceutical care
7. The use of pharmaceutical care strategies to oversee correct use of medicines
8. Initiating or modifying therapy is something pharmacists are permitted to do within their field of work
9. Encouraging people to care for their health.
10. Using management principles when working in pharmacy
11. VICE Health Services' capacity to carry out research projects

Nelson Mandela University, North-West University (Potchefstroom Campus), Rhodes University, Sefako Makgatho Health Sciences University, Tshwane University of Technology, University of Limpopo, University of KwaZulu-Natal (Westville Campus), University of the Western Cape and the University of Witwatersrand currently offer the BPharm program for four years.

At different campuses, the teaching methods are not the same; six schools use passive learning, but Sefako Makgatho Health Sciences University, Tshwane University of Technology and University of Limpopo opt for problem-based learning. Those who have completed their degree must then spend a year as an intern in an authorized training area and pass an exam given by the SAPC. Upon completing the course, graduates are allowed to register and then serve one year doing community service at a government or state hospital.

While the objectives for BPharm graduates are to be equipped for all areas of pharmacy work, large differences can be found in how universities design and focus their courses. As a result, students may face difficulties when substituting courses at different schools and keep wondering how to standardize pharmaceutical education. In the beginning of their studies, students have more kinds of science-related modules to choose from, with Sefako Makgatho Health Sciences University being the only exception. Towards the end of the fourth year, the modules

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offered by different colleges gradually become more alike, as they focus on preparing students for their future work. Participating in work-integrated learning is an important part of pharmacy students' education and it starts from their first year. Experiential learning time can differ widely among colleges, with only 60 hours at the University of KwaZulu-Natal and 490 hours at Sefako Makgatho Health Sciences University given over four years(7). Because of this huge divide, it becomes necessary to question whether students are skilled enough to start their careers after they graduate. Besides, usually in experiential learning, much more importance is given to hospitals and community pharmacies and little to industrial pharmacy and primary healthcare clinics.

One issue in this field is deciding if the current curriculum is sufficient for turning out graduates who are experts in different pharmacy sectors. No sufficient training in business, leadership or human resources is given to budding pharmacists, even though these are basic skills expected from them. Though many pharmacy schools pay attention to other subjects, not enough time is spent on teaching how to use pharmacy dispensing software.

### **3. New Trends and Future Plans for Pharmacy in South African**

#### **More People Seeking Inexpensive Medicines**

HIV and AIDS have made it very clear that South Africa's healthcare system is inadequate, mainly in the area of pharmaceutical support. Since 2009, when the nationwide antiretroviral medication was released, pharmacists have come to play a central role in healthcare, highlighting some serious issues facing the profession. Thanks to this public health movement and new trends in medicine, more pharmaceutical companies are choosing to enter the South African market now.

As a result, regulations have been greatly affected. Applications for product registration at the MRA have grown from 613 in 2005 to 1,162 in 2006 and reached more than 1,300 in 2013. As the number of applications spiked sharply, along with the difficulty of approving them, the large volume overwhelmed the system which resulted in 2,000 unprocessed requests and slowed registration times. Because of these obstacles, pharmaceutical companies and patients can face obstacles with medications and finances.

This has made it clear that pharmacist education and training are not sufficient for graduates to work in medical regulation. Insufficient education offered to undergraduates is the main reason why South Africa lacks regulatory pharmacists today. Programs for future pharmacists are not giving them sufficient preparation for this field. People are working on forming an academy that will provide training for regulatory pharmacists to help resolve this major workforce issue(8).

An additional concern that has appeared in the last decade, along with government action to make more medicines available to all, is the management of drug supply chains. Missing important medicines in pharmacies is now usual, mostly because of the failures in purchasing them and managing stocks. This illustrates that there may be issues with the way pharmaceutical education and training is conducted.

Both regulatory issues and the supply chain must be given priority for additional study by pharmacists specializing in these subjects. Offering financial incentives and proper recognition of workers' achievements motivates staff and builds morale. Though the South African Pharmacy Council is still developing specialty registration, it is important to carefully reassess the importance of some specialties within South Africa. Currently, the biggest challenges for the country are not only faced by clinical pharmacists but also occur at key points in the pharmaceutical system. This means regulatory and logistics experts may also be important for expanding services that matter to a wide range of people.

#### **Telehealth and AI are being used in managing medications**

Due to the pandemic, technology is now being used more widely in healthcare, mainly through telehealth services. With digital transformation happening at a fast pace, more health systems are set to use digital health technology and robots to organize their medication administration. With today's technology changes, pharmacists and support staff might be in charge of coordinating digital health technology use in their daily tasks to ensure patients are well served.

Lately, pharmacists' role has shifted from simply selling products to offering comprehensive care to patients. Pharmacy's advancement has quickened following the acceptance of new professional services, including PCDT, vaccination, COVID-19 testing and preparing to implement PIMART services. Clearly, the field is headed toward providing more clinical care. Using the experience of pharmacists more strategically could strengthen the health

system together with public health.

### **Why There Needs to Be a Community Service Year**

From information gathered by the South African Pharmacy Council, there are currently about 30 pharmacists for every 100,000 people in the country(9). At the time of writing, Gauteng province leads other areas in the number of pharmacists which is 6,354, joined by specialists and professionals in pharmacokinetics or nuclear pharmacy. These results confirm that rural regions, as well as underserved areas in South Africa, are still experiencing great shortages of pharmacists.

Initially after South Africa's democracy was restored, community service was required of graduates working in pharmacy, mainly to tackle the gap in workforce distribution. These days, setting up the community service system is becoming a problem due to the lack of accessible public sector posts and the influx of new graduates. For this reason, many interns have difficulty finding jobs, leaving communities without enough pharmaceutical care.

In 2017, the Pharmaceutical Society stated that if the government was not able to financially support pharmacy service in communities, it had no reason to require such service and should stop it. The argument now has more credibility because of the possibility for community pharmacists to carry out their services at private-sector pharmacies where places in the public sector have become too few. Still, allowing this accommodation may weaken the purpose of: improving health care for underserved communities, creating learning opportunities for young people and establishing careers there.

Chopra's study along with other researchers finds that while South Africa has made some progress on health objectives in the intercostal millennium development goals, the progress is not enough or has even resulted in going backwards for key health areas like pharmaceutical service equity.

### **In South Africa, there are Pharmacy Specialties**

Their work can be found in the retail community, in hospitals, in colleges and universities and in industrial areas. More people work in hospitals and retail community pharmacies, whereas only a few go into industrial pharmacy (as production, regulatory, quality control and leading pharmacists) or academic pharmacy (as teachers and researchers at different education levels). Even though clinical pharmacokinetics has become an official discipline within the South African Pharmacy Council, there are few state practices that feature it.

The SAPC's 2020 report indicates that clinical pharmacokinetics and radio-pharmacists are the two registrable categories of pharmacist specialists. Every year, the Primary Care Drug Therapy category increases which allows doctors, nurses and midwives to provide prescription-only medicines from schedule four to patients with select primary care conditions(10). A new area of practice called Pharmacist-Initiated Management of Antiretroviral Therapy (PIMART) allows pharmacists to take on more responsibilities. Other specialties being considered are clinical pharmacy (related to pharmacokinetics), public health service and industrial pharmacy. The SAPC has not yet granted pharmacy practice the status of a specialty.

## **4. Advice and Points to Consider for Pharmacy Practice in South Africa**

### **Suggestions for Progress**

After reviewing the available evidence, various strategies are proposed to help improve pharmacy practice and education in the country. They address today's challenges and prepare the profession to manage future health needs in the country.

### **Merging curriculums to help education improve**

Preferably, the general recommendation stresses that all BPharm programs should follow the same curriculum. As a result, students from any pharmacy school in South Africa would be expected to perform at the same level during their exit exams. The most ambitious idea is to establish a six-year Doctor of Pharmacy program (PharmD) that would allow trainees to practice advanced pharmacy duties and use good management skills before working. Because of these changes, pharmacists will now be able to play several different roles in healthcare.

Because curriculum design varies greatly in the early years, it creates many problems for students who move from one institution to another, as well as issues with having similar training for all professionals. Variety in educational models does promote new ideas, although the broad differences in experiential learning hours may make it harder for everyone to gain the same expertise. If all experiential learning is based on solid evidence, every graduate can

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develop similar knowledge and skills.

Moreover, current courses do not provide enough focus on business management, improving leadership, HR management and using technology which are all critical aspects for today's pharmacists. New curriculum models should incorporate the main competencies as well as the basics of pharmaceutical sciences and patient care. Because digital technology is being used more in healthcare, placing importance on using pharmacy management software and telehealth apps is necessary.

### **Gaining Specific Skills and Developing a Career**

Following this, efforts should include speeding up the registration of new pharmacy specialties along with aggressive campaigns to attract pharmacists toward pursuing further education. Having subject matter experts in many areas would help the profession influence healthcare services and policies. We should focus on clinical pharmacy specialties as well as on growing experts in areas such as regulatory affairs, pharmaceutical supply chain management and public health pharmacy to solve the country's major challenges in the field.

Only clinical pharmacokinetics and radio-pharmacy have so far been recognized through the current process of specialty development. Having a narrow focus keeps important specialties out of pharmaceutical care. More advanced education programs would allow experienced workers to advance and could solve some of the current gaps faced in different areas of healthcare.

A detailed framework for a specialty area in pharmacy includes advanced roles for community pharmacy, community care, pharmaceutical policy, informatics and advancing pharmacy in education. Every specialty in speech and language should include postgraduate learning, practicum supervision and regular professional development to maintain professionals' skills.

### **Developing Rural Workers**

Governments and institutions should set out clear procedures for higher education to help shape the rural workforce. It means hiring students from rural areas, giving them access to rural experiences as part of their undergraduate learning, offering designated development chances for primary service years and raising the salaries for rural practice to entice doctors.

Many studies show that individuals with rural backgrounds who have enjoyed positive rural training are more likely to work in rural areas. As a result, pharmacy schools ought to ensure that qualified rural students get more attention during the admissions process and include dedicated rural tracks in their studies. Formal partnerships between educational places and rural healthcare services would allow students to learn about the advantages and freedom that working in rural areas offers.

Many physicians are drawn to certain areas because of the better pay offered there. Bringing rural allowances to a high enough level would help balance out obstacles to rural doctors' work and bring parity to their income. Connecting rural workers through online groups and communities could prevent them from experiencing professional isolation, one of the main difficulties in retaining them.

### **The Use of Interprofessional Education and Practice**

Adding interprofessional education to the curriculum of every health profession is strongly recommended. It would help all participants in the field recognize what is expected of them and also support the development of a pharmacy workforce that meets present healthcare needs.

Despite the role of teamwork in healthcare, many professionals still receive education in fields separated from other professions. Sharing learning experiences would help build respect and teamwork among people studying pharmacy, medicine, nursing and allied health. Planned experiences should begin with classroom activities and move on to opportunities with doctors and other members of a clinical team in later stages of training.

Specific areas of interprofessional skills must deal with team communication, explaining roles on the team, leading groups, resolving conflicts and preparing a coordinated care plan. Focusing on explicit lessons for teamwork and communication would help pharmacists be prepared for work alongside other professionals. It is especially necessary now that pharmacists can support primary care and provide antiretroviral services.

### **Comprehensive Conclusion**

This review explores the context of pharmacy practices in South Africa, considering challenges and future possibilities. The review has revealed gaps between current Bachelor of Pharmacy courses and the demands of today's healthcare system.

It is found that society's difficulties with medicine in South Africa are caused by poor systems in medicine production, registration, managing the chain and delivering to health institutions. They are not limited to money problems and also involve slow and ineffective regulations as well as educational shortcomings in certain parts of pharmaceutical management.

Even though community service for healthcare professionals in rural communities could be effective, studies have shown that it works best when paired with other programs that help keep professionals there. Proposing harmonized curriculum, developing specialties, bringing to mind rural areas and interprofessional practice gives a wide-ranging approach to these ongoing issues.

While there have been great improvements in pharmacy practice since apartheid ended, there is still a lot that needs to be done to ensure everyone has equal access to quality medicines across South Africa. All stakeholders including schools, regulators, organizations and government bodies should cooperate to apply effective steps that address both the workforce problem and the issue of insufficient drug supplies for vulnerable people.

Putting the recommendations in practice can make pharmacy education and practice in South Africa more suited to diverse needs, better help with major public health problems and prepare the profession for the future challenges in healthcare. The progress of pharmacy in South Africa relies on the link between what is taught, what is permitted by law and how pharmacies actually function.

## **5. Looking Forward and Discovering New Areas in South African Pharmacy**

### **Digital Transformation and Using Technology**

Digitalization is transforming the way pharmacy operates in South Africa. Pharmaceutical care will undergo significant change through the advent of electronic health records, e-prescribing, telepharmacy and applications that handle medications. Pharmacy education in South Africa must quickly adapt so that graduates are equipped for the digital age and not just taught about digital health as a single subject issue.

Techniques powered by artificial intelligence are being used to address safety concerns, offer input into medical choices and help predict health outcomes in pharmacies. They might be able to spot when a patient will have a medication problem, drug interaction or adverse effect, so this issue can be fixed without the patient ever experiencing it. They can identify signs that someone might abuse prescription drugs or find patients who may gain from medication therapy management. To make use of latest technology, pharmaceutical professionals in South Africa should be taught healthcare IT, data analysis and the challenges of people working with computers.

Using blockchain in the healthcare sector can address issues related to counterfeit medications, mainly by ensuring all drugs are properly tracked. Because of this technology, medication movements are recorded throughout the entire supply chain which may help solve key issues related to medication integrity in South Africa. Graduates could effectively use new technologies in pharmacy if science-based assessments and the study of implementation were included in their training.

It became easy for patients to get pharmaceutical care using telehealth platforms, as seen in the COVID-19 pandemic. Clinical pharmacy services in rural areas can help resolve the wide gap in medication-related care between cities and rural regions in South Africa. Learning to use telepresence skills and perform virtual and remote consultations ought to become normal in pharmacy curricula nowadays.

### **The area of climate change is now part of environmental pharmacy**

With the rise of climate change, pharmacists now face important public health challenges. Sudden changes in the weather can prevent medicine from reaching patients, make it difficult to store them safely and increase requests for drugs that address illnesses related to the climate. White Paper | South African pharmacists need to be fully prepared for disasters and emergencies to ensure pharmaceutical services keep running amidst climate-related disturbances.

An increase in environmental damage and resistance to medical treatments happens due to pharmaceutical pollution. Therefore, environmental protection in South African pharmacy practice should include green pharmacy practices such as offering to return their drugs and making greener choices in transactions. Students should learn in pharmacy classes about environmental health, so that after they graduate, they can assist patients in reducing pharmaceutical waste and know how to properly dispose of medicines.

Because of climate change, cases of respiratory diseases, infections carried by insects and heat-related ailments are

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now more common. Since community pharmacists are first to interact with many, they should keep updating their clinical skills to manage these new health issues. Emphasizing climate-health in the public health pharmacy specialty can help the profession meet these new issues.

#### **Pharmacogenomics and Precision Medicine focus on discovering the role of genetics in medical conditions**

With the help of genetic information, pharmacogenomics could play a key role in personalizing medicine for each individual. Because of the huge variety in the population's genes, using precision medicine may be a challenge or a benefit in South Africa. Even though accessing pharmacogenomic testing is restricted by resources in public healthcare, introducing it gradually into drug administration would greatly improve healthcare.

Pharmacists with expertise in genomic medicine link research and technology in genetics with clinical care, help interpret the results and provide practical advice on how to use the information for treatment. This type of labor force should be formed by instructing future pharmacists in pharmacogenomics from their early pharmacology and biology classes, encouraging specific post-graduate careers.

South Africa's pharmacy needs research on ways to make pharmacogenomic testing affordable when resources are scarce. By using risk-based methods and testing only certain patients, it may be possible to bring precision medicine to South Africa. Academic pharmacy groups should focus on this research area and generate strategies for putting research into practice in various healthcare environments.

#### **Providing more pharmaceutical care for patients with non-communicable diseases**

There has been a rise in diabetes, hypertension, cardiovascular disease and chronic respiratory diseases in South Africa. Attention to infectious diseases in healthcare has frequently led to insufficient care for people with chronic conditions. Community pharmacists are not used enough to tackle this problem.

Services offered by pharmacists for NCD management are delivering good results globally. Using the same models in South Africa as part of drugstore disease management could boost adherence to medicines, enhance medicine monitoring by care teams and prevent some complications through early recognition. Programs should place importance on teaching clinical assessment, decision-making using research proofs and teamwork for handling patients with chronic disease.

Community pharmacy efforts to screen for NCDs not yet detected could allow many more people in communities with little primary care access to be detected earlier. Creating standard guidelines and referral schemes for pharmacy screening would allow many people to receive NCD care without investing heavily in health infrastructure. Courses for pharmacists should focus on learning screening, risk evaluation and health improvement methods for factors related to non-communicable diseases.

#### **Mental Health Pharmacy Service**

Although mental health issues make up a large part of South Africa's health concerns, only a very small fraction of patients are able to get appropriate treatment. Community pharmacists interact with individuals living with mental health difficulties, but most do not have training to help them. Building solid mental health expertise among pharmacists can increase the availability of care.

Such services carried out by skilled pharmacists could help patients receive proper treatment and avoid harm by regularly evaluating their results, safety and how regularly they take the medication. Teamwork between pharmacists and mental health experts would provide easier access to patients and still provide adequate professional supervision. Special areas of knowledge should include psychopharmacology, understanding the impact of drugs on patients and detection of dangerous mental health conditions that call for immediate intervention.

Another important area where pharmacists help improve mental health care is by reducing the stigma of mental illnesses. The team in a pharmacy can help create a non-judgmental atmosphere by the use of respectful language, confidential sessions and by increasing their understanding of mental illnesses. Students should be taught effective ways to reduce stigma and support people with mental health issues.

#### **The topics of Antibiotic Stewardship and Antimicrobial Resistance are important in the healthcare field**

With a high amount of infectious diseases affecting the population, AMR becomes an even bigger threat to South Africa than to other countries. Pharmacists contribute to antimicrobial stewardship by ensuring that the right types of antimicrobial agents are given at the right time and quantity. Developing these functions in every practice area should be a main priority for the advancement of pharmaceutical practice.

There is a lack of development in using community pharmacies to manage and address inappropriate antibiotic use, especially for respiratory infections commonly treated with antibiotics. Clear guidelines for checking symptoms,

handling these issues and referring to the doctor would help decrease unnecessary use of these medicines. Therapeutics courses in pharmacy should make sure to discuss and practice the principles of antimicrobial stewardship.

Hospital pharmacists who use prospective audit, offer suggestions and provide feedback for prescribing antimicrobials have seen improved results in prescribing and treating infections. Expanding these drug services at South African hospitals would help with each patient's needs and also respond to the larger public problem of AMR growth. Special courses aimed at developing expertise in infectious disease pharmacy and antimicrobial stewardship should be set up for post-graduate programs.

Alliances between stakeholders in pharmacy practice and microbiology can result in useful data locally to inform choices for treatment in cases of resistance. The research area should be prioritized by university pharmacy departments, leading to the development of systems that follow and identify patterns of drug resistance in various areas of health care. Suitable infrastructure would help ensure antimicrobials are used according to science while also contributing to the global link of antimicrobial resistance monitoring.

## **6. Conclusion and Future work**

An examination of South African pharmacy practice from a higher education viewpoint has been provided, noting the major changes the profession has experienced since 1994. It becomes clear during the analysis that many improvements have been made, yet some issues persist in providing fair, accessible and high-quality care with medication.

Pharmacies in South Africa have been transformed through the introduction of new ownership Model, price regulations and requirements for holding licenses to operate. The goal was to provide more access to pharmaceutical services, but research shows that this has not fully been achieved in certain rural and disadvantaged areas. Even with reforms in legislation, the number of pharmacies serving people in many regions does not meet the need for fair distribution.

Because healthcare requirements are evolving in South Africa, education in pharmacy has changed and nine institutions are now providing the Bachelor of Pharmacy degree. Nevertheless, there are large differences in the way curriculums, approaches to teaching and available experiences are designed. Because the standards are not consistent, there are worries that cross-sectional knowledge about business management, leadership, regulatory affairs and supply chain logistics in the workforce will not improve. Many medical students could be insufficiently prepared for digital technology in hospitals, due to deficiencies in the current medical curriculum.

Various pressing issues must be dealt with right now to ensure that pharmacy practice keeps advancing in South Africa. Spectrum's drug registration process is slowed by complex regulations which has created a shortage of qualified specialists in India. Medicine shortages are a result of problems with logistics as well as gaps in managing the supply chain. Even though the community service year was designed to solve the problem of unbalanced staffing, it has struggled to become a steady solution for those communities.

Moving ahead, the pharmacy profession in South Africa should focus on new roles as well as fighting the problems that have always been present. Within areas such as antiretrovirals for HIV care and the use of drugs in primary medicine, as well as drug-related services in hospitals, pharmacists are showing greater responsibility in caring for patients. Furthermore, having knowledge in pharmaceutical public health, digital health, precision medicine and environmental pharmacy will allow the profession to meet new healthcare challenges successfully.

Through these recommendations, this review outlines the main activities needed to promote pharmaceutical care in South Africa. Such proposals consider present problems and create a path for the profession to overcome future healthcare challenges.

Pharmacy practice is still changing in South Africa and it has not yet reached a final state. Adjusting to new healthcare, technology and public health matters will be crucial to remain relevant and successful. The pharmacy profession can greatly benefit and contribute to South African healthcare by finding solutions to existing problems and exploring emerging possibilities.

All major organizations, companies and professionals involved in healthcare should unite and arrange for these recommendations to be successfully implemented for the benefit of the country's pharmaceutical workforce and

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healthcare system. All these policies will help pharmacy increase its involvement and benefits for patients in every South African community. It helps to verify your answers after you finish.

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### **Conflicts of interest**

The authors have no conflicts of interest to declare

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