

*Full Length Research Paper*

# **Clinical Pharmacy in South Africa: Qualitative investigation of perspectives of practicing pharmacists**

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The National Department of Health identified the need for Universal Health Coverage, highlighting improved access to quality healthcare in South Africa. Clinical pharmacists play a vital role in various settings, including medication safety, therapeutic drug monitoring and antimicrobial stewardship. Healthcare-related key performance indicators measures quality that ensure accountability, improve patient safety and assist decision-making. To understand the perceptions of pharmacists regarding education, barriers and outcome measures on practices of clinical pharmacy, this study employed qualitative research, with focus-group discussions and in-depth interviews. Dialogue from interviews and focus-groups were audio-taped, transcribed and stored as MS-Word™ documents. NVivo® were utilised to identify themes. Pseudo-names ensured participant confidentiality. Ethics approval was obtained from the Sefako Makgatho University Research and Ethics committee, participating private-healthcare groups and Government Research Offices. Pharmacists were interviewed in eight provinces, identifying seven themes. The majority of pharmacists felt that notable differences exist between the scope of practice of ward- and clinical pharmacists. Most pharmacists did not know the definition of pharmaceutical care. The consensus was that clinical functions require more in-depth work than functions by general pharmacists. All pharmacists experienced barriers to performing their functions. Mostly outcome measures used by pharmacists pertain to antimicrobial stewardship, pharmacists felt that additional training is necessary to perform clinical functions. Clinical work is considered more intense and requires greater involvement in multidisciplinary teams. The study contributes to the state of clinical pharmacy in South Africa. It provides insight into the different levels of clinical pharmacy practice. The findings provide insights into the implementation of Clinical pharmacy services in developing countries.

**Key words:** Clinical pharmacy, pharmaceutical care, barriers, outcome measures.

## **INTRODUCTION**

Clinical pharmacy, which includes pharmaceutical care or the direct supervision of a patient's pharmacotherapeutic needs (SAPC, 2014; Bronkhorst et al., 2018), is a rapidly developing field for practicing pharmacists in South Africa (SA).

According to the American College of Clinical Pharmacy (ACCP), clinical pharmacists have advanced education and training to obtain the skills to practice in direct patient care environments (ACCP, 2014). Training of clinical pharmacists in SA includes a Master's degree in clinical

pharmacy. This was originally initiated in 2000 by one University, who graduated around 114 students since (Crafford et al., 2021). Four other universities followed, however not with a modular Master's degree, and graduated much less students (around 18). Rhodes University offered a PharmD programme (Gous and Schellack, 2014), who graduated around 16 students before discontinuing the course. The slow uptake of clinical pharmacy services can be related to infrastructure and resource limitations (Crafford et al., 2021).

Many institutions employ ward pharmacists to perform pharmaceutical care (NDoH, 2015). Hence, the level of pharmaceutical care differs in different institutions and between practitioners.

In 2015, the National Department of Health (NDoH) published a report describing the need for Universal Health Coverage (UHC), which described the need for improvement of access to quality healthcare in South Africa (NDoH, 2015). Over and above the pharmacist's role in the stable supply of medicines, they must also play a broader role as caregivers, rather than dispensers. The National Core Standards set out by the NDoH in 2011, described a specific domain for patient safety, clinical governance and patient care (NDoH, 2011). These guidelines are still followed by the Departmental Monitoring Group, to ensure the vision of the guidelines are followed. A Cochrane meta-analysis, of both national and international studies, confirmed clinical pharmacists' role in various settings (Hindler and Stelling, 2007; CDC, 2014; Kim et al., 2015; Kolman et al., 2016), like therapeutic drug monitoring (TDM) (Simpson, 2004; Viljoen et al., 2016), reduction of medication errors (Simpson, 2004; Wong et al., 2008; Truter et al., 2017), and medication reconciliation (Sebaaly et al., 2015; Van Kemseke et al., 2017; Naicker et al., 2018). Clinical pharmacists also play a role in specific speciality care environments such as cardiology (Francis and Abraham, 2014), and oncology (Dobish et al., 2014). Although studies have been done in SA on the role of the clinical pharmacist in critical care (Bronkhorst et al., 2014) and neonatal care (De Jager et al., 2014), it is generally in limited settings and isolated. In SA, although clinical pharmacists are not recognised as specialists, the South African Pharmacy Council (SAPC) encourages the pharmacist to be part of the multidisciplinary healthcare team (SAPC, 2014).

Although the scope of practice of a clinical pharmacist has been published by the South African Pharmacy Council (SAPC, 2014), and practice guidelines have been published (Bronkhorst et al., 2020) no adaptive standard practice guidelines exist for clinical pharmacy practice in SA. Healthcare-related key performance indicators, such

as the number of pharmacist-led interventions, the number of drug-related problems identified or the level of patient satisfaction, are quantifiable measures of quality that may ensure accountability for the health care professional (Bronkhorst et al., 2020).

Performance indicators improve patient safety as well as assist role-players in decision-making (Fernandes et al., 2015).

Knowledge of the perceptions of pharmacists who practice clinical pharmacy services at the ward level can help improve the quality of and implementation of patient care in different settings (Dosea et al., 2017). Faced with changes in the role of South African pharmacists, understanding the perceptions of these professionals regarding the practice of clinical pharmacy services is of utmost importance. The terms "Pharmaceutical Care" and "Clinical Pharmacy", as adopted by the SAPC and the South African Society of Clinical Pharmacy (SASOCP), can be defined as a health science specialty applying the scientific principles of pharmacology, toxicology, pharmacokinetics and therapeutics to the care of patients, and the responsible provision of pharmaceutical care with definite outcomes and improvement of patient care in mind, respectively (Hepler and Strand, 1990; ACCP, 2016).

## Aim

The study sets out to describe the perceptions of pharmacists regarding factors such as education, barriers and outcome measures in the practice of clinical pharmacy.

## Ethics approval

Ethics approval was obtained from the Sefako Makgatho Health Sciences University Research and Ethics committee (SMUREC) (number: SMUREC/H/110/2015:PG). Consent to perform the study was obtained from the participating private healthcare groups as well as the respective Government Provincial Research Offices. Participation in the study was voluntary and pseudo-names were assigned to all participants to ensure anonymity.

## METHODS

### Clinical pharmacy

It can be defined as 'a health science specialty that embodies the

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application, by pharmacists, of the scientific principles of pharmacology, toxicology pharmacokinetics and therapeutics to the care of patients' (ACCP, 2016).

### Pharmaceutical care

Originally defined by Hepler and Strand (1990) as *'the responsible provision of drug therapy for the purpose of achieving definite outcomes that improve a patient's quality of life'*.

### Study design and duration

The qualitative design included focus group discussions and in-depth interviews. Pharmacists in similar geographical locations were grouped together for focus group discussions, and in-depth interviews were held with individual pharmacists in more remote areas.

The data were collected over a six-week period. The researcher had training in qualitative research and collected all the data herself.

### Study population and sample

The study participants included pharmacists who were identified from data collected during a previous study (Bronkhorst et al., 2018), where pharmacists performing clinical pharmacy activities or rendering pharmaceutical care duties at the ward level were identified. The study population included pharmacists from private as well as public tertiary hospitals.

A total of five focus group discussions and 28 interviews were conducted with a total of 38 pharmacists being interviewed. The majority of participants were from Gauteng Province (17; 45.9%), female (34; 91.9%), between 31-40 years old (22; 59.5%) and either holding an MPharm degree (19; 51.4%) or busy completing an MPharm degree (11; 29.7%). Qualitative sampling was employed; the sampling procedures did not aim to obtain a representative sample, but rather to select subjects with the purpose of gaining an in-depth understanding of the research question (Hardon et al., 2005).

The homogeneity or heterogeneity of the study sample determined whether it was adequate to meet the needs of the study (Leedy and Ormrod, 2016). The sample size for the present study was small since the target population is homogenous and the aim was to elicit information, not cases. Purposive sampling was used to select clinical pharmacists for in-depth interviews. These pharmacists were selected from different private hospital groups as well as from central and tertiary public hospitals. These participants were best equipped to address the research question as a result of their work experience and scope of practice. Interviews were conducted until all subjects were interviewed or data was saturated.

### Data collection instrument

The questions for the focus group discussions were determined following the work of an earlier study (Bronkhorst et al., 2018). In cases where unclear responses were provided or further explanation was required, appropriate probes were used according to the discretion of the investigator. A focus group guide was used, with questions derived from the quantitative results from a previous study (Bronkhorst et al., 2018) to include questions and possible probes about the study problem. The in-depth discussions were intended to explore quantitative results from a previous study.

### Data collection and analysis

The audio of the dialogue from the interviews was recorded. Interview audio files were transferred from the digital voice recorder to a computer and stored as Windows Media Audio files. Recorded interviews were transcribed verbatim by the investigator immediately after each of the interviews was conducted, typed and stored as MS Word™ documents. Transcripts were imported into NVivo® 11 software (QSR International, 2011) to apply the necessary coding. A thematic approach to the analysis of the data was followed. Data were coded into categories by the first author and an independent coder and then corroborated to conclude the final categories and overarching themes.

## RESULTS

### Demographic data of participant

Five focus group discussions and 13 in depth-interviews were conducted, with 38 participants. The majority of participants were from Gauteng Province (17; 45.9%), female (34; 91.9%), and 51.4% (19) were in possession of a postgraduate degree.

### Themes

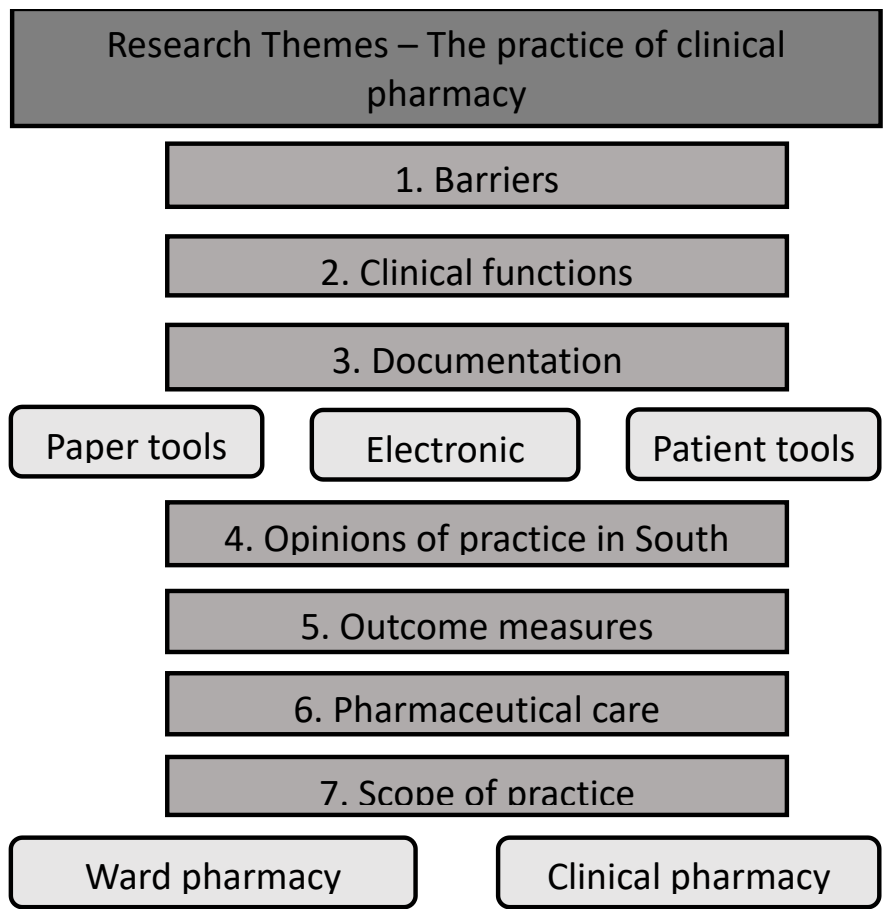
The seven themes and five sub-themes, as identified during the analysis process, were supported with direct quotes and excerpts from the interviews and discussions, where applicable. Grammatical errors were corrected to enhance the readability of quotes. Pseudo-names were assigned to participant quotes to maintain confidentiality. The themes discussed are depicted in a diagrammatical representation shown in Figure 1.

#### *Theme 1: Scope of practice*

The majority (89.6%) of pharmacists expressed that there is a notable difference between the scope of practice of a ward pharmacist and that of a clinical pharmacist. However, none of the pharmacists interviewed was aware of the published scope of practice of the clinical pharmacist, nor the scope of practice of a ward pharmacist as set out in the Good Pharmacy Practice. The statements below illustrate the perceptions of pharmacists on the scope of practice of pharmaceutical care.

*"A clinical pharmacist makes interventions in drug dosages, renal function, liver functions, and drug interactions. Also, go on ward rounds with the doctors and assist in making decisions about the correct medication choices. The pharmacist would do the prescription evaluation, look at the laboratory results, pharmaceutical calculations and according to that, recommend changes to the doctor regarding the therapeutic plan."*

*"Interpretation of a prescription is easier if you are a*



**Figure 1.** Themes identified during discussions. Source: (from study results).

*clinical pharmacist and you have more clinical background and knowledge.”*

**Theme 2: The definition of pharmaceutical care**

Most pharmacists (62.3%) did not know the specific definition of pharmaceutical care. As evidenced by the comments below, most expressed that pharmaceutical care is the responsibility of all pharmacists, however, some felt that pharmaceutical care is the exclusive duty of the clinical pharmacist.

*“The philosophy has always been that pharmaceutical care is one of the tools that a clinical pharmacist use to reach his goals. To ensure the patient’s medication-related problems are addressed, medication-related needs mentioned included: indication, effectiveness, safety and adherence, and from that formulate the drug-related problems.”*  
*“I think every pharmacist performs pharmaceutical care, not only ward pharmacists or clinical pharmacists. To my mind it is that you read the*

*prescription, interpret it and then act on it.”*

**Theme 3: Functions pertaining to clinical pharmacy**

The majority of pharmacists (89.8%) felt that therapeutic drug monitoring (TDM) is exclusively a clinical pharmacist’s function. Most of them (94.3%) felt that antimicrobial stewardship (AMS) is an important clinical function. The consensus was that clinical functions are more in-depth work than functions performed by a general pharmacist, as is evident by the following responses:

*“Major intervention for a clinical pharmacist for instance is the therapeutic drug monitoring of amikacin. Other functions will be looking at blood culture results, doing renal function adjustments for doses and checking for possible interactions.”*

Ward-pharmacists without any clinical pharmacy training stated that they do not have the confidence to do more specialized functions, and will focus more on general

work like ordering medication, checking for allergies and therapeutic duplication.

*“A ward pharmacist will definitely not do that in-depth intervention. Ordering medication is more of a general pharmacist’s job. They will also look at drug allergies and therapeutic duplication. The clinical pharmacist will evaluate the patient’s data, look at blood gas results, and look at laboratory results to look for infection markers. Antibiotic stewardship and many of the things that come along with it, checking the results, apply the drug-bug match; it’s more for clinical pharmacists.”*

*“Clinical pharmacy should be looking at the bigger picture in terms of evidence-based practice like multiple antibiotics usage, or too many drugs, and drug interactions.”*

The participants had some difficulty rating the importance of interventions and felt that there is no standard of practice available for them to measure their work.

*“Clinical pharmacy is looking at a holistic approach that is going to matter to the patient in terms of therapy, in terms of mortality, quality and morbidity. It is assessing the patient’s basic data such as physical examination, vitals, notes, also medication, to see if all medications are indicated, effective, safe, looking at adherence, reconciliation and laboratory results.”*

#### **Theme 4: Documentation of work and tools**

Most (73.3%) pharmacists developed their system for documentation of their work, which includes paper-based documentation on notepads or notebooks. The private hospital groups have electronic systems for documentation of specific interventions, especially antimicrobial stewardship interventions. These systems are used in varying degrees, as is evident by the comments:

*“A notepad will be used and patient stickers on each page will be followed by patient information and issues detected. Afterwards in the pharmacy, you will read up on issues identified in each patient. Then interventions will be recorded on a system for the healthcare group.”*

Many pharmacists (44.3%) stated that they do not record their work, mostly because of time constraints.

*“Only around 50% of interventions and reviews are recorded.”*

The tools that pharmacists use to assist them in performing their clinical duties include textbooks, for instance, the South-African Medicines Formulary (SAMF) and the National Essential Medicines List (EML) online,

especially in the public sector, but most pharmacists prefer to use electronic resources or applications (app) on cellphones or tablets like Medscape.

*“Mostly, phone applications are used. Medscape for drug interactions and the Sanford guide for dosing of antibiotics, especially renal dosing. Applications are nice because it is being updated and it provides up-to-date data.”*

#### **Theme 5: Barriers**

All the pharmacists interviewed (100%) felt they experienced some form of barrier to performing their function optimally.

Dedicated time seems to be the greatest barrier for most of pharmacists (76.3%), as most hospitals do not have dedicated posts for clinical ward-pharmacists and they still need to perform functions about dispensing and stock control in the pharmacy.

*“Pharmacists are awarded so little time to spend in the wards. If more staff were available, they could easily be allocated to the wards full time.”*

Another barrier for most pharmacists is the attitude of other staff members (63.2%), including pharmacy colleagues, management, nursing staff and doctors.

*“Teamwork is a challenge. Sometimes the clinical pharmacist is seen as a threat instead of a team member, more like a ‘policeman’ than a team player in the patient’s care.”*

*“They think a pharmacist is supposed to dispense, you don’t question, you don’t do anything else, you dispense your drugs and that’s it.”*

Lack of mentorship, or preceptorship, is experienced as a barrier, and some pharmacists feel that they do not have adequate knowledge and exposure (47.4%).

*“I miss mentorship. It is my greatest wish to join a clinical pharmacist to work so that one has the correct guidance to do it right.”*

#### **Theme 6: Outcome measures**

The majority of pharmacists (78.3%) do not use specific outcome measures to measure the impact of their work. Some outcome measures that are utilised at the moment mostly pertain to antimicrobial stewardship and include the length of therapy, the double cover of the spectrum and appropriate laboratory tests. They also record whether an intervention was accepted or not.

*“How many interventions were done and what functions have been done is measured, but in terms*

*of how it benefited or what were the outcomes for the patient, it's difficult to say."*

Some pharmacists (58.2%) felt that it would be beneficial to look at more patient-based outcome measures, for instance, length of stay and mortality, although the data is not always available to them.

*"Clinical pharmacists measure the number of interventions that are accepted and rejected. They can look at vital signs, infection markers, pyrexia going down after the intervention, but the opinion is that it's on clinical knowledge that they rate what they've done, but it cannot always be proven."*

### **Theme 7: Opinions on clinical pharmacy**

The opinion on the state of clinical pharmacy in South Africa differed greatly. Some pharmacists felt very positive (23.6%), while others felt that the profession is in a cul-de-sac due to the tardiness of the authorities to implement specialist registration (33.2%).

*"From when I first started working as a clinical pharmacist until now, people are much more aware of what clinical pharmacists do. The doctors are much more receptive of their contribution."*

*"It will be great if the pharmacy council can finalise their requirements, so you can know where to proceed. Many pharmacists have now obtained the degree, but you can still not call yourself a clinical pharmacist, because you are not registered as such."*

Table 1 contains more direct quotes from participating pharmacists supporting the different themes identified.

## **DISCUSSION**

Although the South African Pharmacy Council (SAPC) has published a proposed scope of practice for clinical pharmacists, and the required curriculum for specialisation (SAPC, 2014), no requirements or specific key-performance indicators for registration as a specialist pharmacist have been published (SAPC, 2014). Many pharmacists practice pharmaceutical care at the ward level, however, they had some difficulty rating the importance of interventions and felt that there is no standard of practice available for them to measure their work. The majority of pharmacists agreed that there is a notable difference between the scope of practice of a ward pharmacist and that of a clinical pharmacist.

Most pharmacists felt that therapeutic drug monitoring (TDM) is exclusively a clinical pharmacist's function, while most of them stated that antimicrobial stewardship (AMS) is an important clinical function. International

literature describes the roles of clinical pharmacists e.g. participation in ward rounds, drug therapy reviews, preventing drug interactions, optimising dosing and frequency and reducing prescribing errors (Jacobi, 2016). Other clinical pharmacist functions described include developing quality assessment tools and evaluating data, as well as education of peers and other healthcare workers. The consensus was that clinical functions are more in-depth work than functions performed by a general pharmacist and that further training is necessary (Jacobi, 2015; Dosea et al., 2017).

The findings reiterate the statement by Jacobi (2015) that clinical pharmacists need advanced education and training to effectively focus on comprehensive medication management. Ward-pharmacists in the study stated that they do not have the confidence to interact with prescribers the way trained clinical pharmacists do. El-Awaisi et al. (2017) stated that healthcare professionals, including pharmacists, need to develop the knowledge and skills required to effectively gain confidence to work together with the multidisciplinary team to positively impact patient care. In another study, the lack of knowledge and training of pharmaceutical staff were noted as a barrier to the successful implementation of clinical pharmacy services (Dosea et al., 2017).

Gropi et al. (2018) showed the importance of intervention-capture in a study where documentation was shown to advance clinical pharmacy practice by linking clinical and economic outcomes. Although private hospital groups have electronic systems for documentation of specific interventions, especially in antimicrobial stewardship, the majority of pharmacists keep their documentation system, which is not reported to other members of the healthcare team or hospital management. Pharmacists who do not record their interventions felt that is mostly because of time constraints. In a study by Minard et al. (2016), pharmacists felt that documentation of clinical activities was unnecessary, difficult to maintain and tiresome.

All the pharmacists interviewed felt they experienced some form of barrier performing their function optimally. As indicated by the lack of documentation, time seems to be the greatest barrier for most pharmacists, as most hospitals do not have dedicated posts for clinical or ward pharmacists. This fact is echoed in the study by Minard et al. (2016), where pharmacists identified an increased workload as a barrier to the implementation process, in large part due to the availability of time. Another barrier for most pharmacists is the attitude of other staff members, including pharmacy colleagues, management, nursing staff and doctors. The role of the clinical pharmacist as part of the healthcare team is not regularly recognised. In a study by Chevalier et al. (2016), nurses and physicians changed their opinions from before to after implementation of clinical pharmacy services, to agree that pharmacists must participate in ward activities and that having a pharmacists present to manage

Table 1. Quotes from pharmacists.

Theme	Quotes
<b>Scope of practice</b>	<p><i>"A clinical pharmacist will focus on the correct prescribing and advice, if there is challenges. Often they are contacted by the doctors to give advice on certain patients. A clinical pharmacist will be part of the multidisciplinary ward rounds."</i></p> <p><i>Clinical pharmacists is when you finish your degree, or actually you must, if the Council get their things in place, have a number of years of experience. Clinical pharmacists must also behave more in a leadership role and manage other people."</i></p> <p><i>"A ward pharmacist must see that they are doing everything correct, like infusions and correct doses given."</i></p> <p><i>"A ward pharmacist must see that they are doing everything correct, like infusions and correct doses given."</i></p>
<b>Definition of pharmaceutical care</b>	<p><i>"To my mind it is that you read the prescription, you interpret it and then you act on it."</i></p> <p><i>"...pharmaceutical care involves the assessing of the patient needs, the compiling of an action plan. Devising a treatment plan in collaboration with the doctors and also monitoring that plan."</i></p> <p><i>"Ensuring that all the medicines that are used for the patient are safe and effective and the patient is on the right medicine at the right dose and is given at the right time."</i></p> <p><i>"Pharmaceutical care is the care of the patient's medication-related needs, actually quite comprehensive, to have a comprehensive look at the specific patient, which medicines he have, co-morbidities, illness and to integrate it all. And then ensure that medicine-related needs are measured."</i></p>
<b>Functions pertaining to clinical pharmacy</b>	<p><i>"I think AMS is the most important one."</i></p> <p><i>"The priority is AMS, it is the area I have the most understanding and experience in and feel most confident in."</i></p> <p><i>"When you are doing antimicrobial stewardship, it is definitely clinical work."</i></p> <p><i>"The analysis of a prescription by a clinical pharmacist in itself is completely different. I look at it differently compared to a normal pharmacist who hasn't been given clinical exposure."</i></p> <p><i>"It is really difficult to do TDM, so definitely a clinical function."</i></p> <p><i>"The ability to use TDM. I think this is the great difference between ward pharmacy and clinical pharmacy."</i></p> <p><i>"Clinical functions tend to take up more of your time."</i></p> <p><i>"I don't really go into detail with individual patients and disease conditions, which is the job of the clinical pharmacist."</i></p> <p><i>"Where you can have an impact on the patient's condition, when you actually have a positive impact, like you catch something that could potentially be harmful to the patient. Looking at renal function liver function, the drugs that the patient is on and to make sure there is no harm, to avoid toxicity situations."</i></p> <p><i>"You have to be able to interact with the doctors in terms of how patients should be managed, in terms of therapy, pharmacotherapy, how drugs should be utilised."</i></p>
<b>Documentation of work and tools</b>	<p><i>"I have a book that I usually take to ICU and then I've got a page for each patient, then evaluate each patient and jot down all the interventions that I make."</i></p> <p><i>"I have what they call a peripheral brain, the small book that I carry when I have to follow up with a patient where I record whatever I need to record. I also use the pharmaceutical care form, particularly if I have a particular interest in that case."</i></p> <p><i>"I have my I-pad, so I also have handbook downloaded on my I-pad, like the Pharmacotherapy Di Piro."</i></p> <p><i>"Medscape is my favourite app, because it has many tools. Apps are nice because it is being updated and it provides up to date data."</i></p> <p><i>"I use WhatsApp with the doctors a lot because then they can answer me when it is convenient for them and their phones are not ringing the entire day. That way I also have proof of whatever intervention I've made because it's on that WhatsApp chat."</i></p>

**Table 1.** Cont'd

<p><b>Barriers</b></p>	<p><i>“Clinical pharmacy and ward pharmacy is not always clearly defined. It is sometimes difficult to realise what you must do and what you must spend time on.”</i></p> <p><i>“I am in a dedicated ward pharmacist post, but I still need to do duties pertaining to a pharmacist. So I still have the work profile of a dispensing pharmacist as well.”</i></p> <p><i>“The perception of other staff, like nursing staff, they don’t realize what you do. They simply think that you have a stock control type role.”</i></p> <p><i>“They think a pharmacist are supposed to dispense, you don’t question, you don’t do anything else, you dispense your drugs and that’s it.”</i></p> <p><i>“It is also doctors. Not everyone is aware of the clinical pharmacist. They will say, you are the pharmacist, you must go and dispense medication, that’s it. Dish out the medication.”</i></p> <p><i>“It takes a while to start communicating with your doctors. It takes a while for them to learn to actually trust you.”</i></p> <p><i>“I think I’ve got the knowledge, but in the same breath, if you do not have the experience or the exposure, you lose that knowledge.”</i></p> <p><i>“I feel I don’t have enough knowledge to say to a doctor you can not prescribe this medication, but rather prescribe this.”</i></p> <p><i>“We lack mentorship. Someone to ask if you have a question, someone to support you with queries.”</i></p>
<p><b>Outcome measures</b></p>	<p><i>“I don’t think we as pharmacists can really evaluate the clinical outcome or how the patient feels. We are not trained for that.”</i></p> <p><i>“I do not have access to our mortality data and ICU length of stay, because our management do not feel that it is information a pharmacist will need. There is no way that we can actually calculate the cost difference in the care of the patient.”</i></p> <p><i>“As a group we look at surgical site infections in terms of surgical prophylaxis. Also at infectious markers, like CRP, PCT, but that is the only measures. But we do not necessarily record it.”</i></p>
<p><b>Opinion on clinical pharmacy</b></p>	<p><i>“We’ve got to really create the space for the clinical pharmacists so that we can see more of these positive outcomes, because there is a lot that we can add.”</i></p> <p><i>“I think clinical pharmacy is underestimated. I think the value of clinical pharmacists are still not really recognised.”</i></p> <p><i>“I feel like everyone thinks I’m a nice to have, but not a have to have.”</i></p> <p><i>“I think the registration is important. I really got to battle to keep the passion alive. I’ve been told at work that you are doing this work but you are not guaranteed a post when you complete your degree.”</i></p> <p><i>“I think I would love to see that pharmacists in South Africa work towards one combined goal ant it is towards patients’ health and to improve the outcomes.”</i></p>

Source: (from study results).

medication issues allowed them to feel more confident and leaves them to concentrate on their own professional roles.

Preceptorship or mentorship is an aspect that pharmacists felt is lacking in the South African environment. Some felt they do not have adequate knowledge and experience. In the United States, clinical pharmacists undergo a two-year PGY-residency, wherein an established clinical pharmacist mentors the candidate to perform

clinical duties (Jacobi, 2016). The results from the study highlights the aspect of a lack of preceptorship in the South African environment. Some pharmacists felt that while not having adequate knowledge and experience, experienced mentors to guide them are not available.

The in-depth investigation on the opinion on the state of clinical pharmacy in SA resulted in varying opinions from practicing pharmacists. Most pharmacists felt positive about the development of

the profession over recent years, while others felt that the profession is in a cul-de-sac due to the tardiness of authorities to implement specialist registration.

Further investigation into the motivation for clinical pharmacists to perform their functions and what they expect specialisation to be, may be necessary to establish the success of a practice. None of the pharmacists were aware of the published scope of practice of the clinical



pharmacist, nor the specific definition of pharmaceutical care. Although pharmaceutical care has been re-defined many times, it is always used to describe the activity as part of patient care (Alleman et al., 2014). Although the majority of respondents felt that pharmaceutical care is the responsibility of all pharmacists, some felt that it is the exclusive duty of the clinical pharmacist.

## Conclusion

Clinical pharmacists in South Africa are building their practice with varying degrees of influence in the practice around them. Specialist postgraduate training of clinical pharmacists in South Africa is growing and those qualified is set on improving practice. They agreed that post-graduate education is necessary to perform their functions. These functions include multidisciplinary ward rounds, assessment of appropriate drug therapy, including therapeutic duplication monitoring, adverse drug events and side effects and to optimise dosing and dosing-frequency. Therapeutic drug monitoring and antimicrobial stewardship are some of the most important functions of the clinical pharmacist as perceived by South African pharmacists. Although pharmacists perform these functions often, no quality assessments for professional practice are available to measure standards of practice.

In conclusion, the lack of general standard of practice guidelines in South Africa needs to be addressed to standardise practice across the public and private sectors in the country.

## CONFLICT OF INTERESTS

The authors have not declared any conflict of interests.

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