

Investigating the management training needs of responsible pharmacists under 35 years in South Africa

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DECLARATION

I, Phillip Boonzaier, hereby declare that this mini-dissertation and interrelated, publishable manuscripts that I herewith submit for the Master of Business Administration at the North-West University are my independent work and that I have not previously submitted it for a qualification at other institutions of higher education.

I, Phillip Boonzaier, declare that the text and bibliography reflect the sources I have consulted. Sections without source referrals are my ideas, arguments and/or conclusions.

I, Phillip Boonzaier, hereby declare that I am aware that the copyright of this mini-dissertation is vested in the North-West University.

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DEDICATION

I want to dedicate this Mini-Dissertation to the following people:

I want to express my deepest gratitude to my amazing wife, Philmarié Boonzaier, who stood by me through the late nights of writing, tirelessly bringing me coffee and offering unwavering motivation when I felt like giving up.

A heartfelt thank you goes to my study leader, Dr Mariet Eksteen. Her guidance and infinite patience, especially when stubbornness got the better of me, were instrumental in this journey of profound personal growth. Without Dr Eksteen, this mini-dissertation wouldn't have reached such a high standard, and my understanding of pharmacy management wouldn't be as comprehensive.

Special thanks to my dear friends, Prof Nico Schutte and Prof Nicolene Barkhuizen, for always being there when I needed advice on writing or unravelling the complexities of statistical analysis during my research.

Last but certainly not least, I greatly appreciate my mother and father. While they may not have fully grasped all the intricacies of my excited explanations, their constant expressions of pride meant the world to me.

PREFACE

This mini-dissertation has been prepared in article format. Two manuscripts have been prepared.

I, Phillip Boonzaier, am the primary author of both manuscripts and conducted most of the manuscripts' preparation, writing, technical editing and structuring. I was guided by my co-authors, Dr MJ Eksteen and Prof TE Du Plessis, who are also the supervisors of this mini-dissertation. Prof EN Barkhuizen did data analysis, and she was acknowledged accordingly for support and assistance.

The first manuscript, titled "Gender perspectives on the current application of young responsible pharmacist management competencies", was prepared according to the journal submission guidelines for the *South African Pharmaceutical Journal* (SAPJ) (cf. Annexure 5) and has been **accepted for publication** (cf. Annexure 6).

The second manuscript, titled "Current management needs for early career responsible pharmacists in South Africa", was prepared according to the journal submission guidelines for the *Pharmacy Education Journal* (PEJ) (cf. Annexure 7) and submitted in November 2023 (cf. Annexure 8).

These role players provided permission for the manuscripts to be submitted for degree purposes:

MJ Eksteen (co-author)

TE du Plessis (co-author)

EN Barkhuizen (co-author)

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I want to acknowledge the following contributions:

Dr MJ Eksteen and Prof TE du Plessis provided study guidance and support.

Prof EN Barkhuizen provided statistical analyses.

Dr W Basson acted as a gatekeeper during the survey portion of the research.

The researcher personally funded this research project.

ABSTRACT

Background: In South Africa, current legislation allows for the appointment of a young pharmacist post-internship to the position of a responsible pharmacist (RP) without taking into consideration the competency level, as established by the South African Pharmacy Council (SAPC). The competency standards differentiate between the level of practice expected for entry (less than 3 years), intermediate (between 3 and 7 years) and advanced (more than 7 years) pharmacists. Several managerial and organisational competencies are listed in the competency standards. RPs are accountable to the SAPC for all activities performed in the pharmacy and by the pharmacy personnel, increasing the accountability and responsibility of such positions significantly.

Aim: The objective of this survey was to investigate the management training needs of responsible pharmacists under 35 years in South Africa.

Methods: A quantitative approach, utilising a cross-sectional design within the positivist paradigm was followed. Ethical clearance was obtained prior to the distribution of a self-developed questionnaire. The questionnaire gathered demographic data as well as the participant's current level of competency and management training needs. This questionnaire was disseminated to all RPs in South Africa who were under the age of 35 (N=956) and delivered a response rate of 18% (n=188), of which only 123 questionnaires were suitable for further analysis.

Core findings: Two core findings were derived from this study. Firstly, young pharmacists appointed as RPs rated their current level of competency lower than what is needed to effectively function as an RP or what compares with their years of experience. Female RPs, who, despite possessing more than three years of experience as pharmacists, predominantly rated their competency as entry-level. Male respondents rated their competency levels between intermediate and advanced competency levels. Secondly, young pharmacists indicated a variety of management needs across human, financial, pharmaceutical infrastructure, change and policy development management. The data indicated that young pharmacists are often appointed to RP positions without being on the adequate competency level to successfully execute the duties expected of them. This study recommends that a training course be developed for RPs to ensure they are suitable prepared for the role.

Key terms: Competency standards; Early career pharmacist; Management training; Pharmacy management; Pharmacy profession; Responsible pharmacist; South Africa; Training needs; Young pharmacist.

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LIST OF ABBREVIATIONS

ADU	Automated Dispensing Unit
ANOVA	Univariate Analysis of Variance
BPharm	Bachelor of Pharmacy
CE	Continued Education
CPD	Continuing Professional Development
EMS-REC	Economic and Management Sciences Research Ethics Committee
GPP	Good Pharmacy Practice
HR	Human Resource
MANOVA	Multivariate Analysis of Variance
MBA	Master's in Business Administration
NWU	North-West University
PCDT	Primary Care Drug Therapy
PEJ	Pharmacy Education Journal
PSSA	Pharmaceutical Society of South Africa
RADU	Remote Automated Dispensing Unit
RP	Responsible Pharmacist
SAPC	South African Pharmacy Council
SAPJ	South African Pharmaceutical Journal
SEP	Single Exit Price
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Sciences
STEM	Science, Technology, Engineering, and Mathematics
WHO	World Health Organization
YPG	Young Pharmacists' Group

LIST OF DEFINITIONS AND TERMINOLOGY USED IN THE STUDY

Competency: A quality or characteristic of a person related to effective or superior performance. Competency consists of aspects such as attitudes, motives, traits and skills (SAPC, 2018:4).

Continuing professional development (CPD): A process by which registered persons continually ensure and enhance their competency throughout their professional careers. CPD encompasses a range of activities, including continuing education and supplementary training (SAPC, 2018:4).

Responsible Pharmacist (RP): A natural person who is a pharmacist and who shall be responsible to the council for complying with all the provisions of this Act and other legislation applicable to services which specially pertain to the scope of practice of a pharmacist and the legislation applicable to the pharmacy which is under his or her supervision (Department of Health, 2000b).

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CHAPTER 1 INTRODUCTION

1.1 Introduction

This in-depth study investigated the management training needs of responsible pharmacists (RPs) under the age of 35 years in South Africa.

The study investigated the management skills needed by an RP under the age of 35 years to manage a pharmacy. This need was reviewed considering the management module in the Bachelor of Pharmacy (BPharm) qualification, and the competency standards prescribed by the South African Pharmacy Council (SAPC). The chapter aimed to orientate the reader on the research that was conducted. All relevant aspects, e.g., the research questions, objectives of the study, research design and methodology, quality assurance, ethical implications, etc. were discussed in this chapter as no dedicated chapter on methodology was included in this mini-dissertation due to the article format followed.

1.2 Background to the research problem

After completion of the BPharm qualification and a one-year internship, graduates can register as pharmacists to perform pharmaceutical community service with the SAPC (Department of Health, 2000a). The Regulations relating to the practice of pharmacy clearly state the acts pertaining to the profession of pharmacy, as well as the scope of practice for pharmacists (Department of Health, 2000b), which can be practised after registration as a community service pharmacist and thereafter.

The BPharm qualification aims to deliver a well-rounded generalist graduate, who can work in a variety of practice settings with the same qualification, such as academic and training institutions, pharmacies, manufacturing plants, supply chain facilities or consultancies and administrative organisations (SAPC, 2018:6). Some of these practice settings require the supervision of a dedicated pharmacist, referred to as an RP, and who is ultimately responsible to the SAPC for all activities and aspects of such a pharmacy (Department of Health, 2000b).

In South Africa, there is currently no additional requirement for a pharmacist to become an RP, other than just being registered with the SAPC as a pharmacist. However, what is often overlooked is the additional responsibilities that an RP must adhere to when accepting this additional role, often in addition to being a dispensing pharmacist and tutor to support personnel. The Rules relating to Good Pharmacy Practice (GPP) stipulate on numerous occasions the role and responsibilities of the RP (SAPC, 2004:162). In essence, RPs must ensure that they continuously supervise the pharmacy in

which they have been appointed (SAPC, 2004:169), including pharmacy administration and management.

Although the BPharm qualification does include competencies around management, it is limited to a few credits over a four-year programme as set out in domain 4 (SAPC, 2018:33), and cannot be compared with other business management qualifications. In addition to only having basic training in management, young pharmacists accepting positions as RPs early in their career may not have sufficient experience in the practice setting. This opens the possibility for legal and disciplinary action against these young pharmacists as they may find themselves acting in a manner where the dignity or the honour of the profession is harmed (SAPC, 1989), or it could result in performing professional acts for which he is inadequately trained or insufficiently experienced (SAPC, 2018:14).

1.3 Problem statement

There are currently no programmes dedicated to ensuring that young pharmacists who will be RPs are on an advanced knowledge level with the necessary management knowledge, such as finance, human resources, marketing, etc. in South Africa. When looking at the competency standards outlined by the SAPC (SAPC, 2018:33-35), the skills required for management do not fit into the skills required for an entry-level pharmacist. Management skills are only introduced on the intermediate phase and are a requirement from the advanced phase. During the entry-level phase, the pharmacist is only required to *know* specific skills (e.g. competency standard 4.1, behavioural statement 4.1.4.1: Adhere to basic human resources management legislation, the Labour Relations Act and Basic Conditions of Employment Act). In the intermediate phase, the pharmacist has to start to *participate* (e.g. competency standard 4.1, behavioural statement 4.1.4.2: Monitor adherence to relevant human resources management legislation, e.g. Labour Relations Act and Basic Conditions of Employment Act). In the advanced phase, they must be able to *do* (e.g. competency standard 4.1, behavioural statement 4.1.4.3: Develop and train pharmacy personnel). A situation might be created where young pharmacists accept RP positions without knowing the responsibility and legal risks.

This raises the question as to whether the BPharm curriculum sufficiently prepares pharmacists for the managerial requirements that come with being an RP who is still in the entry or beginning of the intermediate level on the SAPC competency standards, and whether these RPs have additional training needs to fulfil their roles as RPs.

1.4 Overall goal of the study

The overall goal of this study was to investigate the management training needs of RPs under 35 years in South Africa. This investigation determined the current management skills level of young RPs as well as the day-to-day management issues and training needs, they may experience.

1.5 Aim of the study

The study investigated the management training needs of RPs under 35 years in South Africa and how these needs can best be addressed.

1.6 Research questions and objectives of the study

In order to address the problem statement, the following research questions were considered:

1. What is the current management skills level of RPs under 35 years in South Africa?
2. What are the day-to-day management issues of an RP?
3. What are the management needs of RPs under 35 years in South Africa?
4. What can be done to ensure RPs under 35 years gain the necessary management skills to move from entry/intermediate to an advanced level?

To achieve the aim and answer the study's research questions, the following objectives were pursued:

1. To determine the current management skills level of RPs under 35 years in South Africa. This objective addresses research question 1.
2. To determine the day-to-day management issues of an RP. This objective addresses research question 2.
3. To determine the management needs of RPs under 35 years in South Africa. This objective addresses research question 3.
4. To identify areas of management skill that RPs under 35 years need to move from entry/intermediate to advance level. This objective addresses research question 4.

1.7 Research design

1.7.1 Description of overall research design

The quantitative research method was used to generate hard facts and numerical data using statistical, logical and mathematical techniques. This method employed an objective approach to data with a result-oriented inquiry method when it comes to data collection and interpretation (Bryman *et al.*, 2021:309). In a cross-sectional sampling technique, the outcome and the exposures of the participants in the study were measured at the same time and at a specific point in time. This allowed the researcher to get a good image of the study population (Munro *et al.*, 2017:134).

Quantitative research with a cross-sectional component falls in the positivist approach. This was used by implementing questionnaires that had a focus on management. This was sent out to all RPs under the age of 35 years registered with the SAPC at the time. Analyses and numerical data were used to find patterns and averages to make predictions and reach conclusions (Ragab & Arisha, 2017:8). The data collected from questionnaires was used to conduct the study and formulate conclusions without resending the questionnaires to the participants over an extended time. Using this method ensured the study was conducted correctly and reliably in the period available (Bryman *et al.*, 2021:322).

Survey research is described as assessing a known population through questionnaires. A questionnaire helps to obtain facts and opinions about the phenomenon under study from people informed on the issue (Bartley & Hashemi, 2021:249). Questionnaires allowed the researcher to determine the extent to which the participant holds an attitude or perspective. The questionnaire aimed to explore the management needs of South African RPs under the age of 35 years and determined which tools can be given or developed to help resolve their management needs. The questionnaire was compiled by looking at the literature on the competency standards as outlined by the SAPC and the competency standards.

1.7.2 Population and sampling

1.7.2.1 Population

Population refers to a pool of individuals grouped by a common feature or characteristic that makes them relevant to the research that is conducted (Kumar, 2014:231). In this study, the population was all RPs registered with the SAPC. The SAPC maintains a register of RPs in South Africa as per the Regulations relating to the registration of persons and the maintenance of registers (Department of Health, 2000a).

As of 1 October 2020, there were 15 251 active pharmacists in South Africa, of whom 4 313 (28%) were RPs, with 956 under the age of 35 (22%) (SAPC, 2020). The average age of RPs in South Africa was 46 years old (SAPC, 2020).

Table 1: Responsible pharmacists' average age (in years)

Province	Female	Male	Average
Eastern Cape	43	49	46
Free State	43	50	46
Gauteng	44	50	47
KwaZulu-Natal	41	49	44
Limpopo	38	41	40
Mpumalanga	42	45	44
North West	43	49	46
Northern Cape	43	49	46
Outside South Africa	44	0	44
Western Cape	43	51	47
Average	42	49	46

1.7.2.2 Sample size

Sample size refers to the number of participants included in a study. This group is a subset of the study population in which the researcher is interested and represents a percentage of the total population (Creswell & Creswell, 2018:151). This study's sample size was all RPs under 35 who are currently working in South Africa and are registered with the SAPC. At the time, there were 956 RPs under the age of 35 (22% of the population group) who fall in the population group of the study (SAPC, 2020). The study's margin of error will be 5%, with a confidence level of 95%.

1.7.2.3 Sampling strategy

The SAPC holds a register of all registered pharmacists and RPs (Department of Health, 2000a). By filtering the register for RPs under 35 years, the desired population group was extracted, and a reliable

questionnaire was sent to the participants to conduct the research. The study's geographical area was all nine provinces of South Africa. This also spanned over all pharmacy sectors (community; manufacturing; hospital; institutional; and wholesale pharmacy) where RPs are mandatory by law (Department of Health, 2000a).

In the probability sampling method, participants were selected based on the statistical theory of probability out of the larger research population pool. This meant that everyone in the population had an equal chance of being selected to participate in the study, which allowed the researcher to get a sample size that is a good representation of the population pool (Strydom, 2021:233).

1.7.3 Data collection

1.7.3.1 Gatekeeper

A gatekeeper, who was not a member of the research team, was appointed to control access to the participants. Dr Willem Basson from the Department of Pharmacy Practice at the North-West University (NWU) School for Pharmacy acted as the gatekeeper and sent the survey to the population group. The SAPC acts as a custodian to the RP list and sent the email addresses of the RPs who fall into the study population group to Dr Basson only. The SAPC has placed the following restrictions and conditions on the use of the RP list.

1. The data may be used exclusively for the research project as identified in the intended ethics committee approval.
2. The data may only be used by the researcher and may not be given or sold to any other person for use or distribution thereof and must be protected from such distribution at all times.
3. In the event that there may be emails to registered persons, such communication must explain that the information is for approved research purposes only.
4. Communication to registered persons, if any, must allow for an opt out of receiving email communication/further communication; and
5. The outcomes of the research must be shared with the SAPC. Failure to adhere to the conditions herein will result in the relevant legal action as the Council may deem appropriate.

1.7.3.2 Developing and testing the questionnaire

The researcher developed a questionnaire based on the theoretical framework for the study. The questionnaire consisted of 61 items (cf. Annexure 1).

A four-point Likert scale was used to measure the responses. This allowed the researcher to add four extreme possibilities without a neutral choice on this type of Likert scale. This is known as the 'forced choice' method (Lee *et al.*, 2019:13). The four-point Likert scale offered options for 'Definitely do not need training', 'Do not need training', 'Do need training' and 'Definitely do need training'. This allowed for a more accurate measurement of the data when received from the participants.

Developing and testing a questionnaire before it is utilised in the study remain of utmost importance, because the questionnaire had never been used before. Before the questionnaire was administered to participants, some aspects needed consideration. The level of education of the sample group needed to be taken into consideration when choosing the questions to ensure that the question format and terms used were understood by the participant. This allowed the researcher to ensure the coding was done correctly to assist in establishing validity and reliability. An exploratory and confirmatory factor analysis approach was used with structural equation modelling to establish face and content validity (Fouché & Roestenburg, 2021:176).

The questionnaire was distributed to subject matter experts in the field of management to establish the face and content validity thereof. Reliability was established by using the Cronbach alpha coefficient for each factor that was extracted by the analyses. This gave statistical evidence of the reliability of the questionnaire (Creswell & Creswell, 2018:153).

1.7.3.3 Nature of the data

The study involved primary data in the sense that the researcher collected his own data by using a questionnaire that was self-developed based on research done.

The questionnaire was used to determine whether the participants believe they have the necessary training to be an RP. Because the research topic has not been researched thoroughly in South Africa, there were no existing questionnaires that could have been used to conduct the research.

1.7.3.4 The data collection process

The researcher used the Survey Monkey to setup the questionnaire. Survey Monkey is an internet-based customer relations system that can also administer surveys with data analytics and highly rated cybersecurity (Survey Monkey, 2010). Survey Monkey also allows the survey creator to build rules that will keep the survey short by showing a text block if the participant chooses a specific option and does not show the extra block if they choose one of the other options. These features allowed the creator to maximise the survey experience for the participant without making them lose interest or feel overwhelmed.

The gatekeeper sent the questionnaire to all RPs under the age of 35 listed on the SAPC's registry using an introduction email (cf. Annexure 2). A general email was sent to all participants two weeks after the survey's initial distribution to remind the participants who have not yet completed the survey to please do so. The researcher monitored the completion rate of the surveys, and another final reminder email was sent after two weeks. The survey closed two weeks after the final reminder email was sent.

1.7.4 Data analysis

Data analysis refers to the process of applying statistical techniques to clean, model, and transform data to discover information that will help to prove or disprove a hypothesis.

The data from the questionnaire was analysed statistically, reporting on the means, standard deviations, statistics and frequencies (Bartley & Hashemi, 2021:256). Statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS). The questionnaire measured the management needs of young RPs under 35 using exploratory factor analysis and Cronbach's alpha coefficients. Pearson's correlation analyses and hierarchical regression analyses were applied to determine the relationships between the variables. In this study, descriptive statistics (i.e. frequencies, means, standard deviation, skewness, kurtosis) were used to analyse the data. The factor structure of the measuring instrument was determined by using a combination of exploratory and confirmatory factor analyses. The reliability of the questionnaire was determined by using the guidelines of Cohen of $\alpha \geq 0.70$.

1.7.5 Ethical considerations

This research study was registered with the NWU Business School. Approval for the study was requested and obtained from the Economic and Management Sciences Research Ethics Committee (EMS-REC) with ethics number NWU-00729-22-A4 (cf. Annexure 3).

Performing research on RPs under the age of 35 in the pharmacy can cause participants to be afraid to take part due to a fear that the results being used against them or being used to prove their inability to do the job. Therefore, the informed consent form clearly outlined the study's aim and described that all replies are anonymous and only used for data analysis. Where a participant decided to withdraw from the study, there was no discrimination or risk of any backlash. The questions did not have any negative impact on the participants, since all questions focused on management needs and not on any information that would put any participant in a negative light.

1.7.5.1 Information leaflet and informed consent

An information leaflet (cf. Annexure 4) was included in the questionnaire link, requesting informed consent from potential participants prior to participation in the research. The leaflet explained that the study aimed to investigate the management needs of RPs in South Africa under 35. The information leaflet explained the inclusion criteria for the research project and why participants received the request to participate in the research. Additional information, such as that participation was voluntary, and any participant may leave the study at any time and non-participation will not affect the participant in any negative way, was included. Details of all members of the research team were included, should participants feel the need to communicate with the team directly. In this way, potential benefits and risks were highlighted so that the participants could make an informed decision whether or not to participate in the research project.

Participants who agreed to participate in the research, selected *proceed* on the questionnaire platform to access the data collection questionnaire.

1.7.5.2 Right to privacy

Confidentiality was ensured by keeping all information gathered (questionnaire results) on the researcher's password-protected computer to which only the researcher had access. The researcher, study leader and statistician had access to all data collected throughout the data analysis process and documents or Excel spreadsheets were shared via password-protected files in an email and the password was sent via another method, i.e. text message. All possible precautions were taken to ensure that all answers given on the questionnaire remain confidential and will not compromise any participant's identity.

The data collected was **anonymous** as no personal data from participants was collected. No personal data, such as name, place of work or any other identifying features, was collected. Participants were informed that the data and conclusions from the questionnaire were made public upon publishing for this research mini-dissertation.

All data will be kept for seven years and will then be destroyed.

1.7.5.3 Benefit-risk ratio

By participating in this research, participants helped to identify areas where RPs in South Africa are struggling with management principles. The information gathered during the study contributed to the

possible development of a postgraduate course in pharmacy management and a course to address this need in the future.

Participants may feel a little bit of discomfort and insecurity because they may fear that the questionnaire may show that they do not have the necessary skills or proficiency. The risk to the participants was minimal because the answers given in the questionnaire did not have any impact on their day-to-day job or their prospects for advancement in the organisation where they currently work. There was no risk to the participants, because the answers from the questionnaires were anonymous as well as the fact that only the research team saw the raw data.

The benefits of participating in the study outweigh the risks.

1.8 Quality and rigor of the study

Bryman *et al.* (2021:308) describes trustworthiness or rigor of a study as the level of confidence one can place in the data, interpretation, and employed methods, all of which collectively contribute to assuring the overall quality of the study.

Before the study, **internal validity** was established by setting up a detailed outline of the questionnaire that was used. **Face and content validity** was established by distributing the questionnaire to subject matter experts in the field of management. A comprehensive literature review boosted the **validity** of the questionnaire. The **reliability** of the measuring instrument was determined in the study by sending the questionnaire to a statistician to ensure the questionnaire was reliable and an accurate tool when conducting the research.

1.9 Layout of study

The study is presented in the following chapters:

Chapter 1 has provided the overall rationale and background of the study, problem statement, aims and objectives, and has also provided the research methodology that was followed during this research study.

Chapter 2 developed an understanding of the essence of RPs through a literature review. This chapter also explains the nature of the BPharm curriculum, management of pharmacies and the legal implications through a literature review.

Chapter 3 included the two manuscripts that have been prepared from the data gathered. Each manuscript was prepared according to the applicable journal's author guidelines and therefore the formatting of these present differently from the rest of the mini-dissertation.

Chapter 4 concluded the study, presents an evaluation, and formulates limitations and makes recommendations on the management needs of RPs under the age of 35 in South Africa.

1.10 Chapter summary

This chapter aimed to orientate the reader towards the background and context of this research study. The problem was stated, followed by the goal, aim, research questions and objectives identified to resolve the problem and answer the questions.

The research design and methodology were explained for data gathering with questionnaires, including information on the population, sample, data gathering, analysis and reporting.

Quality and rigour, ethical considerations, information leaflet and informed consent, and the participant's right to privacy were addressed. Following the analysis of the benefits and risks associated with participation in this study, it was found that the benefits outweigh the risks.

The chapter concluded with a layout of this mini-dissertation.

Chapter 2 elaborate on the literature review, conceptualising and contextualising the current body of knowledge regarding RPs in the pharmacy profession.

CHAPTER 2 LITERATURE REVIEW

2.1 Introduction

In Chapter 1, the background of the study, problem statement and objectives, and research methodology of the study, were discussed.

This chapter covers the literature that was dealt with in this study. An array of literature was reviewed to assist with answering the research questions, as included in the bibliography.

According to Creswell & Creswell (2018:75), the literature review plays a crucial role in enabling the researcher to assess the significance of the chosen issue for further investigation. There is a possibility that a certain issue may not have insufficient literature, indicating the necessity of doing a research study to offer substantial insights into a relatively underexplored subject matter. Furthermore, if the research lacks a conceptual framework and fails to situate itself within the existing body of knowledge, it may encounter challenges in its realisation. This is because the absence of a foundation in the literature hinders the identification of a starting point for the research.

In this literature review, aspects around pharmacists as healthcare professionals in South Africa were reviewed to understand what allows for registration within South Africa. The allowed scope of practice, supervision provided by pharmacists in pharmacies, and the required knowledge and skills to do so, were discussed.

2.2 Pharmacists in South Africa

According to the Pharmacy Act 53 of 1974 (Department of Health, 2000b), a pharmacist is an individual who has completed a BPharm qualification at an accredited tertiary institution. Following graduation, a 365-day internship under a tutor, who is registered at the SAPC as such, in a pharmacy registered as a training facility, commences. During the internship, the following requirements apply: the tutor's submission of favourable progress reports, competency in six continuing professional development (CPD) activities, and successfully passing the pre-registration examination (SAPC, 2023a:11). Only then will the candidate become eligible for registration as a pharmacist to perform his/her pharmaceutical community service. After completing the mandatory 12 months of community service, the SAPC will be furnished with a report by the relevant health authority stating that the pharmacist has satisfactorily completed pharmaceutical community service.

The curriculum presented by the accredited tertiary institutions is based on the competency standards for pharmacists, as published in 2018 (SAPC, 2018:1). These competency standards informed and

influenced, among others, the BPharm curriculum, SAPC pre-registration policy for pharmacist interns, and scope of practice for pharmacists. The competency framework is divided into six domains with several competencies for each domain. Different levels of behavioural statements accompany each competency to cater for pharmacists progressing from first registration as a pharmacist, into more advanced practice over time (SAPC, 2018:13). Entry-level refers to one to three years of experience as a pharmacist; intermediate level refers to three to seven years of experience as a pharmacist; and advanced level is more than seven years of experience as a pharmacist, all post internships.

According to section 14C of the Pharmacy Act, all pharmacists, pharmacy support personnel and pharmacy students must be registered with the SAPC (Department of Health, 2000b).

The scope of practice of a pharmacist in South Africa is legislated in accordance with Regulations 3 and 4 of the Regulations relating to the practice of pharmacy (Department of Health, 2000b). It is stated that the following acts pertain to the profession of a pharmacist:

1. the provision of pharmaceutical care by taking responsibility for the patient's medicine-related needs and being accountable for meeting these needs, which shall include but are not limited to the following functions:
 - a. evaluation of a patient's medicine-related needs by determining the indication, safety and effectiveness of the therapy;
 - b. dispensing of any medicine or scheduled substance on the prescription of a person authorised to prescribe medicine;
 - c. furnishing of information and advice to any person with regard to the use of medicine;
 - d. determining patient compliance with the therapy and follow up to ensure that the patient's medicine-related needs are being met; and
 - e. the provision of pharmacist initiated therapy;
2. the compounding, manipulation, preparation or packaging of any medicine or scheduled substance or the supervision thereof;
3. the manufacturing of any medicine or scheduled substance or the supervision thereof;
4. the purchasing, acquiring, importing, keeping, possessing, using, releasing, storage, packaging, repackaging, supplying or selling of any medicine or scheduled substance or the supervision thereof; and
5. the application for the registration of a medicine in accordance with the Medicines Act.

In addition to these acts, the scope of practice of a pharmacist includes the following:

1. the formulation of any medicine for the purposes of registration as a medicine;
2. the distribution of any medicine or scheduled substance;
3. the repackaging of medicines;
4. the initiation and conducting of pharmaceutical research and development; and
5. the promotion of public health.

Pharmacists in South Africa have a clear scope of practice, regulated by the SAPC, to ensure patient safety and responsible handling of medicines.

2.3 Pharmacies in South Africa

Pharmacy is a diverse and exciting profession with professionals working across very different practice settings (SAPC, 2018:6). The Regulations relating to the practice of pharmacy (Department of Health, 2000b) list five categories of pharmacy (viz manufacturing pharmacy, wholesale pharmacy, community or institutional pharmacy, and consultant pharmacy). In addition, professionals may also work in, among others, the administration, managed care, research, and logistic settings.

It is mandated by regulation 22 (Department of Health, 2000b) that each of the five categories of pharmacy shall operate under the direct personal supervision of an RP. In scenarios where the same owner or company owns more than one pharmacy, regulation 25(3) states that they must ensure that an RP is appointed for each pharmacy wherein or from which operations will take place (Department of Health, 2000b). An RP is defined in the regulations as *“a natural person who is a pharmacist and who shall be responsible to the council [SAPC] for complying with all the provisions of this [Pharmacy] Act and other legislation applicable to services which specially pertain to the scope of practice of a pharmacist, and the legislation applicable to the pharmacy which is under his or her supervision”* (Department of Health, 2000b).

2.4 Role of responsible pharmacists

The Regulations relating to the practice of pharmacy (Department of Health, 2000b) as well as the GPP (SAPC, 2004:169) clearly define the duties and responsibilities of the RP, which include, among others:

- (a) Ensure that they continuously supervise the pharmacy in which they have been appointed.
- (b) Have appropriate qualifications and experience in the services being rendered by the pharmacy.
- (c) Ensure that persons employed in such a pharmacy, and who provide services, forming part of the scope of practice of a pharmacist, are appropriately registered with council.
- (d) Notify council immediately when their role as RP has been or will be terminated.
- (e) Take corrective measures in respect of deficiencies concerning inspection reports of council or terms of the Medicines Act, and
- (f) In addition to the general responsibilities, also
 - (i) Ensure that unauthorised persons do not obtain access to medicines or scheduled substances or the pharmacy premises outside of regular trading hours.
 - (ii) Establish policies and procedures for the employees of the pharmacy concerning the acts performed and services provided in the pharmacy.
 - (iii) Ensure the safe and effective storage and keeping of medicine or scheduled substances in the pharmacy under his or her direct personal supervision, and
 - (iv) Ensure correct and effective record keeping of the purchase, sale, possession, storage, safekeeping and return of medicines or scheduled substances.

In addition to this list of responsibilities, other settings or services may require additional responsibilities from the RP as set out in the GPP (SAPC, 2004:171):

- The responsibilities of an RP of a pharmacy approved to operate an automated dispensing unit (ADU) (rule 1.9.6);
- The responsibilities of an RP of the pharmacy approved by Council to operate a remote automated dispensing unit (RADU) (rule 1.11.6);
- Management of human resources in wholesale and manufacturing pharmacies (rule 3.7.3); and
- Pharmacy administration and management (rule 4.2).

From the abovementioned lists of responsibilities, it is clear that an RP carries a higher responsibility for the operations in the pharmacy.

2.5 Management of pharmacies

According to Erasmus *et al.* (2020:55), there are five management functions essential to effective management, namely operations, human resource, marketing, financial, and logistics management. The importance of management training is sometimes underestimated because some people do not realise that management training provides leaders and managers with the tools and skills, they need to effectively direct their teams toward accomplishing corporate goals. To stay up to date with developments and successfully direct their teams in today's fast-paced and ever-changing corporate scene, leaders must continue to strengthen their management abilities (Schlosser *et al.*, 2023:22).

2.5.1 Operations management

Operations management helps to reduce the manufacturing cost or cost of offering services by improving productivity. This is measured as the output and is an excellent yardstick to know how effective the company is running and where there is room for improvement. For example, if the company produces more products or services and the input is reduced, the business' overall productivity will increase, giving the company increased profitability. The effective use of operations management principles will allow the business to meet the needs of the consumer more effectively with a product that will give the business a competitive advantage in the market in which it is operating (Erasmus *et al.*, 2020:38). This management function links to pharmaceutical infrastructure management in the competency framework set out by the SAPC.

2.5.2 Human resource management

Human resource management is one of the most overlooked areas of management in most businesses. Therefore, human resource management is a crucial element of organisational success. The reason is that it views the human element of business, namely the staff, and helps to manage the different aspects of staff management in a business; therefore, an understanding of labour law and staff retention techniques is essential for effective human resource management (Erasmus *et al.*, 2020:102). This management function links to human resource and change management in the competency framework set out by the SAPC.

2.5.3 Marketing management

Marketing managers need to understand the marketing principles, such as the marketing mix, products, prices, place, promotion, physical evidence, people and partners (Nieman & Bennett, 2014:158; Erasmus *et al.*, 2020:413). Understanding how the marketing mix works will help the manager understand how to best target potential customers and allocate funds to the budget correctly. Understanding the marketing mix will also allow the manager to choose the marketing strategy based on customer service (Kotler & Armstrong, 2016:32; Erasmus *et al.*, 2020:415).

2.5.4 Financial management

Reading and understanding the financial statements are an essential skill a manager needs when managing, as this allows the manager to understand what the business' financial health means and how to address any issues; therefore, financial management is directly linked to the strategic management of the business. According to Nieman and Bennett (2014:293), budgeting and financial control are among the most important areas of knowledge a manager needs when inspecting a business' financial strategy, as these two financial principles are the two areas where most managers lose money early (Marx & Mpofu, 2020:468). This management function links to financial management in the competency framework set out by the SAPC.

2.5.5 Logistics management / Supply chain management

According to Mangan and Lalwani (2016:14), logistics management's focus in most businesses is inventory management and supply/demand planning. These typically include stock and materials management, storage management, and inbound and outbound transportation management (Christopher, 2022). This management function also links to pharmaceutical infrastructure management in the competency framework set out by the SAPC

2.6 Pharmacist's ability to manage pharmacies

In countries such as Ukraine, postgraduate training in pharmacy management is required to become a pharmacy manager or head of a pharmacy (WHO, 2019). Countries such as Poland require the pharmacist to complete further studies before they can become an RP (WHO, 2019). In Spain, the pharmacist must have at least five years' experience in a pharmacy as a pharmacist before applying to become the pharmacy manager (WHO, 2019).

In 2018 Charles Summerlin conducted a study on what training was done to prepare pharmacy students to manage a pharmacy effectively. In the study it was found that female students excelled in areas of training, but male students were more likely to embrace the management role when given the opportunity (Summerlin, 2018:7). Moreover, gender disparity still exists in terms of representation in management in science, technology, engineering, and mathematics (STEM) professions and management roles (Catalyst, 2022). There is an ongoing debate as to whether gender affects management ability. There are arguments that gender does not play a significant role in management ability and that it is dependent on an individual's skills, experience, and education. Women continue to be underrepresented in these fields, with only a small percentage of women occupying leadership positions. According to a report by Catalyst (2022), a global non-profit organisation, women hold only 29% of senior management roles in STEM industries.

There are six competency standards (SAPC, 2018:33) that relate to management, as outlined in Table 2. Certain managerial activities are expected from pharmacists, such as human resource, financial, pharmaceutical infrastructure, and change management, as listed in domain 4.

Currently, the curriculum of the BPharm qualification at most pharmacy schools in South Africa has an average of 18 credits allocated for the management module and consists of the following themes (North-West University, 2021; Rhodes University, 2017; University of the Witwatersrand, 2020):

- Basic change management
- Basic financial management
- Basic human resource management
- Basic logistics management
- Basic marketing management
- Basic quality improvement principles
- Strategies, basic relationships management
- Basic risk management
- Basic strategic management and policy
- Laws and regulations

Table 2: Competency standards (SAPC, 2018:33)

	Item no.	Entry-level into practice		Intermediate practice		Advanced practice	
4.1 Human resource management		Staff have to participate and observe the human resource activities in the pharmacy.		Staff have to begin to supervise and start to assist in human resource matters.		Staff have to manage the pharmacy or the entire pharmacy.	
	4.1.1	4.1.1.1	Contribute to the effective management of pharmacy personnel.	4.1.1.2	Effectively manage pharmacy personnel under personal supervision.	4.1.1.3	Identify human resource requirements and manage human resources effectively.
	4.1.2	4.1.2.1	Undertake continuing professional development.	4.1.2.2	Participate in the provision of staff training and continuing professional development.	4.1.2.3	Identify staff training needs, facilitate appropriate training opportunities, and participate in continuing professional development.
	4.1.3	4.1.3.1	Conduct self-assessments or appraisals in line with the performance management policy.	4.1.3.2	Conduct staff assessments or appraisals in line with the performance management policy.	4.1.3.3	Review performance management policies and processes.
	4.1.4	4.1.4.1	Adhere to basic human resources management legislation, e.g. Labour Relations Act and Basic Conditions of Employment Act.	4.1.4.2	Monitor adherence to relevant human resources management legislation, e.g. Labour Relations Act and Basic Conditions of Employment Act.	4.1.4.3	Develop and train pharmacy personnel in basic human resources management legislation, e.g. Labour Relations Act and Basic Conditions of Employment Act
4.2 Financial management		Staff have to participate and observe the pharmacy's financial activities.		Staff have to begin to supervise and start to assist in financial matters.		Staff have to manage the pharmacy or the entire pharmacy.	

	4.2.1	4.2.1.1	Submit patient prescription claims to health funders to ensure optimum use of patient benefits.	4.2.1.2	Monitor patient prescription claims submitted to health funders to ensure optimum use of patient benefits.	4.2.1.3	Determine dispensing and professional fees to be charged in line with legislation.
	4.2.2	4.2.2.1	Work according to approved budget.	4.2.2.2	Monitor income and expenditure in line with budget prescripts.	4.2.2.3	Develop and effectively analyse and manage financial data and budgets.
	4.2.3	4.2.3.1	Comply with all relevant legislative prescripts.	4.2.3.2	Monitor adherence to all relevant legislative prescripts.	4.2.3.3	Ensure adherence to all relevant legislative prescripts.
	4.2.4	4.2.4.1	Perform cost-benefit analyses.	4.2.4.2	Apply the principles of pharmacoeconomic assessments.	4.2.4.3	Apply the principles of pharmacoeconomic assessments.
4.3 Pharmaceutical infrastructure management			Staff have to participate in and observe the pharmaceutical infrastructure management activities in the pharmacy.		Staff have to begin to supervise and start to assist in pharmaceutical infrastructure management.		Staff have to manage the pharmacy or the entire pharmacy.
	4.3.1	4.3.1.1	Identify pharmaceutical facility and equipment needs.	4.3.1.2	Identify pharmaceutical facility and equipment needs.	4.3.1.3	Identify pharmaceutical facility and equipment needs and develop a plan to achieve and meet the needs.
	4.3.2	4.3.2.1	Monitor the suitability of pharmaceutical facilities and equipment.	4.3.2.2	Monitor the suitability of pharmaceutical facilities and equipment.	4.3.2.3	Manage pharmaceutical facilities and equipment.
	4.3.3	4.3.3.1	Work according to the approved workplace procedures and policies.	4.3.3.2	Implement and monitor workplace procedures and policies.	4.3.3.3	Develop and review workplace procedures and policies as required.
	4.3.4	4.3.4.1	Prioritise and organise workflow and demonstrate time management skills.	4.3.4.2	Manage, prioritise and organise workflow and demonstrate time management skills.	4.3.4.3	Develop and review workflow systems to manage, prioritise and organise daily work and demonstrate time management skills.

	4.3.5	4.3.5.1	Maintain the existing pharmaceutical infrastructure.	4.3.5.2	Contribute to the improvement of the existing pharmaceutical infrastructure.	4.3.5.3	Ensure pharmaceutical infrastructure is in line with legislative requirements.
	4.4.3	4.4.3.1	Work according to the approved document management and recordkeeping systems.	4.4.3.2	Implement a system for documentation and recordkeeping for quality assurance purposes.	4.4.3.3	Develop and update systems for documentation and recordkeeping for quality assurance purposes.
4.5 Change management		Staff have to participate and observe the pharmacy's change management activities.		Staff have to begin to supervise and start to assist in change management.		Staff have to manage the pharmacy or the entire pharmacy.	
	4.5.1	4.5.1.1	Participate in change management processes within the team.	4.5.1.2	Manage a change management process for the team.	4.5.1.3	Contribute to and lead a change management process beyond the team/workplace or across disciplines.
	4.5.2	4.5.2.1	Overcome internal barriers and self-limiting beliefs to change by analysing the climate and the readiness for change followed by measures to improve personnel growth and contribute to organisational success and outcomes.	4.5.2.2	Motivate staff to overcome barriers to change in order to drive organisational success and outcomes.	4.5.2.3	Develop strategies to inspire and motivate staff to overcome barriers to change in order to drive organisational success and outcomes.
4.6 Policy development		Staff have to participate and observe the policy development process in the pharmacy.		Intermediate staff have to start to supervise and assist in the policy development process.		Staff have to manage pharmacy areas or the entire pharmacy and develop a policy framework and standard operating procedures (SOPs).	
	4.6.1	4.6.1.1	Apply policies and SOPs.	4.6.1.2	Implement and monitor policies and SOPs.	4.6.1.3	Develop a policy framework and SOPs

2.7 Legal implications for responsible pharmacists

The legal impact in the absence or incompetence of the RP could result in acts or omissions, leading to disciplinary steps by the SAPC (SAPC, 1989). An RP who does not adhere to the responsibilities, as discussed earlier, may find themselves acting in a manner where the dignity or the honour of the profession is harmed (SAPC, 1989). Even more severe, when a pharmacist accepts an RP position without sufficient skills and knowledge, it could result in contravening ethical rule 22 through the performance of professional acts for which he is inadequately trained or insufficiently experienced (SAPC, 1989). If found guilty of any of these transgressions, the penalties that council may impose include (a) a reprimand or a caution or a reprimand and a caution; or (b) suspension for a specified period from practising or performing any acts forming part of his or her scope of practice as prescribed in terms of the regulations (Department of Health, 2000b).

2.8 Chapter summary

This chapter explained the role of the pharmacist within the South African healthcare context, regulation of pharmacists and pharmacies by the SAPC, the legal requirement for RPs and their role to manage pharmacies and consequences if not conducted correctly.

According to the Pharmaceutical Society of South Africa (PSSA) (PSSA, 2018), the Young Pharmacists' Group (YPG) network consists of individual members of PSSA who are recent graduates (i.e. up to five years after graduation from their first degree in pharmacy) or are below the age of 35 years.

In the competency standards, the execution of the managing skills is expected of the pharmacist in the intermediate to advanced level. This means that it is anticipated that a pharmacist could begin to take management responsibilities after three years. However, in South Africa, a pharmacist can be an RP from their first year of practising as a registered pharmacist. Consequently, there is a risk for pharmacists who accept RP positions early in their careers if they do not have suitable experience.

Therefore, this research explores investigating the management training needs of RPs under 35 years in South Africa. Chapter 3 provides the results of the research objects, in the form of two manuscripts.

CHAPTER 3 MANUSCRIPTS

3.1 Introduction

In chapter 2, an elaborate literature review provided the background to this study by reviewing the registration pathway for pharmacists, their scope of practice and categories of pharmacies. Pharmacists appointed as RPs have additional responsibilities, including the management of the pharmacy. The RP could unintentionally fault their duty as RP and as a result, be charged with unprofessional conduct by SAPC based on the Pharmacy Act 53 of 1974.

In chapter 3, the results of the survey conducted as part of this study (cf. 1.7) has been analysed and included into two manuscripts with significantly different results. The methodology was discussed in chapter 1 but is also included in each of these loose standing manuscripts.

Each manuscript has been prepared according to the author guidelines of the journal selected.

3.2 Manuscript 1

The manuscript titled “Gender perspectives on the current application of young responsible pharmacist management competencies” was prepared according to the journal submission guidelines for the SAPJ (cf. Annexure 5) and has been **accepted for publication** (cf. Annexure 6).

Original research

Gender perspectives on the current application of young responsible pharmacist management competencies

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Abstract

Background: There are five management functions essential to effective management. The South African Pharmacy Council (SAPC) outlines six competency standards relating to management. Pharmacists can become responsible pharmacists (RPs) directly after completion of their internship i.e. in their community service year.

Methods: Quantitative research with a cross-sectional component, which falls into the positivist approach, was used. Questionnaires were sent out to all RPs in South Africa under the age of 35.

Results: Most female RPs were found to be at entry level when measured using the competency standards, while the male respondents were between intermediate and advanced, even though the female respondents had been pharmacists for longer and had more years of experience.

Conclusion: Gender does not play a significant role in the RP's ability to manage a pharmacy, but training does. More research needs to be done to determine if this gender disparity can be addressed by the development of a management training course that is focused on the operation of a pharmacy. Likewise the possibility of introducing a minimum level of training to be registered as an RP, needs to be considered.

Keywords: young responsible pharmacist, management training

Introduction

Competency is when an individual possesses the required practical and theoretical knowledge, cognitive skills and attributes that enable the individual to perform tasks and duties as effectively as possible. Within the context of pharmacists or the pharmacy profession, the responsible pharmacist's (RP's) competencies would refer to the skills and knowledge base necessary to perform the RP duties as stipulated in the competency standards.¹ There are five critical management functions for effective management: operations, human resources, marketing, finance, and logistics.² The South African Pharmacy Council (SAPC) outlined six competency standards related to management that an entry-level pharmacist must understand.¹ The management module in the Bachelor of Pharmacy degree curriculum in most South African pharmacy schools consists of several themes, including basic change, financial management, human resource management, logistics, marketing, quality improvement, risk management, strategic management and policy development, relationship management, and laws and regulations, with an average of 18 credits allocated.^{3,4,5} The competency standards expect pharmacists to execute management skills at the intermediate-to-advanced level, which typically takes more than three years of practice to achieve. However, in South Africa, a pharmacist can become a responsible pharmacist (RP) in their first year of practice post-internship. In other countries, such as Ukraine and Poland, postgraduate training or further studies in pharmacy management are required to become a pharmacy manager, or RP. In Spain, a pharmacist must have at least five years of experience as a pharmacist in a pharmacy before applying to become the pharmacy manager.⁶ Moreover, gender disparity still exists in terms of representation in management in science, technology, engineering, and mathematics (STEM) professions and management roles.⁷

There is an ongoing debate as to whether gender affects management ability. There are arguments that gender does not play a significant role in management ability and that it is dependent on an individual's skills, experience, and education. Women continue to be underrepresented in these fields, with only a small percentage of women occupying leadership positions. According to a report by Catalyst, a global non-profit organisation, women hold only 29% of senior management roles in STEM industries.⁷

The gap that exists is therefore in the area of management where RPs may not be adequately trained and this may impact their ability to effectively manage. This article seeks to investigate the current application of competencies, management areas where RPs may not have adequate training, if this has an impact on their ability to manage, and whether significant differences exist between gender groups.

Methods

Research approach

Quantitative research with a cross-sectional component, which falls into the positivist approach, was used. Questionnaires focusing on management were sent to all RPs under the age of 35 years who were registered with the SAPC. Analyses and numerical data were used to identify patterns and find averages to make predictions and form conclusions.⁷ The data collected from the questionnaires were used to conduct the study and formulate conclusions without resending the questionnaires to the participants over an extended time. Using this method ensured that the study could be correctly and reliably conducted in the period assigned to it.⁸ Statistical analysis was carried out using the Statistical Package for the Social Sciences (SPSS). Reliability and validity were determined using exploratory factor analysis and Cronbach's alpha coefficients. Pearson's correlation analyses and hierarchical regression analyses were applied to determine the relationships between the variables in this study. Descriptive statistics (i.e. frequencies, means,

standard deviation, skewness, kurtosis) were used to analyse the data. The factor structure of the measuring instrument was determined by using a combination of exploratory and confirmatory factor analyses.⁹ The reliability of the questionnaire was determined by using the guidelines of Cohen of $\alpha \geq 0.70$. The four-point Likert scale offers options for 'Definitely do not need training', 'Do not need training', 'Do need training' and 'Definitely do need training'. This allows for a more accurate measurement of the data received from the participants.

Sample

The target population for this study was registered RPs under the age of 35 years of age in the South African pharmacy profession. This sample was purposefully chosen based on the age of the population group. A total of 956 questionnaires were distributed; 188 completed questionnaires were received, of which 123 were suitable for further analysis. The response rate was 18%. The demographic characteristics of the participants are presented per gender group in Table I: Demographic characteristics by gender.

Table I: Demographic characteristics by gender

	Category	Male		Female	
		<i>F</i>	%	<i>F</i>	%
Age	19 to 23 years	5	12,82	12	14,29
	24 to 35 years	34	87,18	72	85,71
Qualification	Bachelor's Degree	32	82,05	71	84,52
	Postgraduate	5	12,82	11	13,10
	Other	2	5,13	2	2,38
Years of work as a pharmacist	0 to 3 years	14	35,90	18	21,43
	between 3 and 7 years	13	33,33	43	51,19
	more than 7 years	12	30,77	23	27,38
Years of work as a RP	0 to 3 years	29	74,36	64	76,19
	between 3 and 7 years	10	25,64	13	15,48
	more than 7 years	0	0,00	7	8,33
Type of pharmacy	Corporate community pharmacy	37	40,22	14	33,33
	Hospital pharmacy private	7	7,61	3	7,14
	Hospital pharmacy public	4	4,35	8	19,05
	Independent community pharmacy	30	32,61	11	26,19
	Manufacturing pharmacy	3	3,26	2	4,76
	Other	4	4,35	1	2,38
	Wholesale pharmacy private	6	6,52	3	7,14
	Wholesale pharmacy public	1	1,09	0	0,00
Business management training received	No	27	69,23	78	92,86
	Yes	12	30,77	6	7,14
Entrepreneurship experience	No	28	71,79	72	85,71
	Yes	11	28,21	12	14,29

From Table I it is evident that both male and female RPs were mostly represented in the 24 to 35 years age group and held an undergraduate qualification. The respondents primarily worked between nought and three years as RPs, and between three and seven years as pharmacists. They were mostly employed in the private sector in corporate and independent community pharmacy. From their training, it is evident that males were exposed to more training in business management and entrepreneurship than females.

Measuring instrument

A self-developed measurement instrument was used to determine the current application of RP management competencies based on the competency standards of the SAPC. Five competency standards were identified, namely Human Resource Management (four items), Financial Management (four items), Infrastructure Management (six items), Change Management (two items), and Policy Development (one item). In accordance with the competency requirements, the responses were measured on three levels: entry, intermediate, and advanced. The self-developed measurement tool was distributed to subject matter experts to ensure the face and content validity. Biographical information that was collected included gender, age, the highest educational qualification, years of work as a pharmacist, years of work as an RP, the type of South African pharmacy they were employed in, and any additional training received.

Research procedure

Permission to do the study was obtained from the NWU Business School. The questionnaires were distributed electronically through a gatekeeper. The questionnaire was accompanied with an informed consent letter explaining the purpose of the study as well the respondent's rights. Participation was voluntary and confidentiality of responses was maintained at all times. Ethical approval for the project was obtained from North-West University (NWU-00729-22-A4) prior to the execution thereof. This research conforms to all ethical rules and regulations pertaining to empirical scientific research.

Statistical analyses

The statistical analyses were done with SPSS (SPSS Inc. 28, 2022). Disruptive statistics such as frequencies were applied. T-tests were used to determine whether significant differences exist between gender based on the pharmaceutical competencies measured in this study. A guideline of $p \leq 0.05$ was used to determine the significance of the results.¹⁰

Results and discussion

The results of the research are presented in the section below. The analyses were done in line with the main research objective of the study, that is to determine gender perspective of the current application of management practices by RPs.

Human resource (HR) management

The respondents were required to report the current demonstration of management competencies in four areas of human resource management in the South African pharmacy profession and labour relations, namely, staff management, staff training and development, performance management. The results are reported in Table II.

Table II: Human resource management

		Levels	Male		Female		Total	Gap	<i>p</i>
			<i>F</i>	%	<i>F</i>	%			
Staff management	Contribute to the effective management of pharmacy personnel.	Entry	13	34,2	39	45,9	52,0	-11,7	0,042
	Effectively manage pharmacy personnel under personal supervision.	Intermediate	7	18,4	32	37,6	39,0	-19,2	
	Identify human resources requirements and manage human resources effectively.	Advanced	18	47,4	14	16,5	32,0	30,9	
Staff training and Development	Undertake continuing professional development.	Entry	10	26,3	26	30,6	36,0	-4,3	0,83
	Participate in the provision of staff training and continuing professional development.	Intermediate	9	23,7	22	25,9	31,0	-2,2	
	Identify staff training needs, facilitate appropriate training opportunities, and participate in continuing professional development.	Advanced	19	50,0	37	43,5	56,0	6,5	
Performance management	Conduct self-assessments or appraisals in line with the performance management policy.	Entry	12	31,6	30	35,3	42,0	-3,7	0,34
	Conduct staff assessments or appraisals in line with the performance management policy.	Intermediate	19	50,0	45	52,9	64,0	-2,9	
	Review performance management policies and processes.	Advanced	7	18,4	10	11,8	17,0	6,7	
Labour relations	Adhere to basic human resources management legislation, e.g. Labour Relations Act and Basic Conditions of Employment Act.	Entry	20	52,6	45	52,9	65,0	-0,3	0,08
	Monitor adherence to relevant human resources management legislation, e.g. Labour Relations Act and Basic Conditions of Employment Act.	Intermediate	10	26,3	31	36,5	41,0	-10,2	
	Develop and train pharmacy personnel in basic human resources management legislation, e.g. Labour Relations Act and Basic Conditions of Employment Act.	Advanced	8	21,1	9	10,6	17,0	10,5	

In the HR management needs assessment, when looking at staff management, female RPs mostly functioned at entry level by contributing to the effective management of pharmacy staff. Male RPs functioned mostly at the advanced level by identifying HR requirements and managing HR effectively. In 2019 Charles Summerlin conducted a study on what training was done to prepare pharmacy students to manage a pharmacy effectively. In the study it was found that female students excelled in areas of training, but male students were more likely to embrace the management role when given the opportunity.¹¹ This is in stark contrast to the findings in this study. When considering the data collected on **staff training and development**, both male and female RPs displayed behaviours in keeping with entry level when identifying staff training

needs, facilitating appropriate training opportunities, and participating in continuing professional development (CPD). When considering **performance management** and conducting staff assessments or appraisals in line with the performance management policy, both male and female RPs displayed behaviours linked to competency standards at the intermediate level. Lastly, when considering labour relations, both male and female RPs were still at the entry level of competency, with RPs indicating that they adhered to basic HR management legislation, e.g. the Labour Relations Act and the Basic Conditions of Employment Act.

Financial management

The respondents were required to report the current demonstration of management competencies in four areas of financial management in the South African pharmacy profession, namely medical finance, budgeting, legislative prescriptions and pharma-economic principles and assessments. The results are reported in Table III.

The results in Table III show that male and female participants mainly applied entry-level management competencies relating to medical finance. The focus was mostly on submitting patient prescription claims to health funders to ensure the optimum use of patient benefits. Concerning budgeting, female RPs mostly functioned at the entry level by working according to an approved budget. Male RPs functioned mostly on the intermediate level by monitoring income and expenditure in line with budget prescriptions. Both male and female RPs complied with all the relevant legislative requirements at the entry level. Lastly, both male and female RPs performed cost-benefit analyses at the entry level of financial management. Male RPs, however, also applied the principles of pharmacoeconomic assessments on an intermediate level and not yet on an advanced level.

Table III: Financial management

	Items	Level	Male		Female		Total	Gap	p
			F	%	F	%			
Medical finance	Submit patient prescription claims to health funders to ensure optimum use of patient benefits.	Entry	21	55,26	45	52,94	66	2,32	0,59
	Monitor patient prescription claims submitted to health funders to ensure optimum use of patient benefits.	Intermediate	11	28,95	29	34,12	40	-5,17	
	Determine dispensing and professional fees to be charged in line with legislation.	Advanced	6	15,79	11	12,94	17	2,85	
Budgeting	Work according to approved budget.	Entry	11	28,95	40	47,06	51	-18,11	0,08
	Monitor income and expenditure in line with budget prescripts.	Intermediate	19	50,00	30	35,29	49	14,71	
	Develop and effectively analyse and manage financial data and budgets.	Advanced	8	21,05	15	17,65	23	3,41	
Legislative prescripts	Comply with all relevant legislative prescripts.	Entry	17	44,74	37	43,53	54	1,21	0,04
	Monitor adherence to all relevant legislative prescripts	Intermediate	2	5,26	17	20,00	19	-14,74	
	Ensure adherence to all relevant legislative prescripts.	Advanced	19	50,00	31	36,47	50	13,53	
Pharma-Economic principles	Perform cost benefit analysis.	Entry	20	52,63	52	61,18	72	-8,54	0,74
	Apply the principles of pharmacoeconomic assessments.	Intermediate	14	36,84	25	29,41	39	7,43	
	Apply the principles of pharmacoeconomic assessments.	Advanced	4	10,53	8	9,41	12	1,11	

Pharmaceutical infrastructure management

The respondents were required to report the current demonstration of management competencies in six areas of pharmaceutical infrastructure management in the South African pharmacy profession, namely pharmaceutical infrastructure needs assessment, facilities and equipment assessment, procedures and policies management, time management, pharmaceutical infrastructure management and document and record keeping management. The results are reported in Table IV: Pharmaceutical infrastructure management.

Table IV: Pharmaceutical infrastructure management

	Items	Level	Male		Female		Total	Gap	p
			F	%	F	%			
Pharmaceutical infrastructure needs assessment	Identify pharmaceutical facility and equipment needs.	Entry	15	39,47	37	43,53	52	-4,06	0,25
	Identify pharmaceutical facility and equipment needs.	Intermediate	6	15,79	19	22,35	25	-6,56	
	Identify pharmaceutical facility and equipment needs and develop a plan to achieve and meet the needs.	Advance	17	44,74	29	34,12	46	10,62	
Facilities and equipment assessment	Monitor the suitability of pharmaceutical facilities and equipment.	Entry	14	36,84	40	47,06	54	-10,22	0,76
	Monitor the suitability of pharmaceutical facilities and equipment.	Intermediate	8	21,05	20	23,53	28	-2,48	
	Manage pharmaceutical facilities and equipment.	Advance	16	42,11	25	29,41	41	12,69	
Procedures and policies management	Work according to the approved workplace procedures and policies.	Entry	13	34,21	30	35,29	43	-1,08	0,58
	Implement and monitor workplace procedures and policies.	Intermediate	14	36,84	26	30,59	40	6,25	
	Develop and review workplace procedures and policies as required.	Advance	11	28,95	29	34,12	40	-5,17	
Time management	Prioritise and organise workflow and demonstrate time management skills.	Entry	8	21,05	21	24,71	29	-3,65	0,67
	Manage, prioritise, and organise workflow and demonstrate time management skills.	Intermediate	17	44,74	34	40,00	51	4,74	
	Develop and review workflow systems to manage, prioritise and organise daily work and demonstrate time management skills	Advance	13	34,21	30	35,29	43	-1,08	
Pharmaceutical infrastructure management	Maintain the existing pharmaceutical infrastructure.	Entry	11	28,95	26	30,59	37	-1,64	0,27
	Contribute to the improvement of the existing pharmaceutical infrastructure.	Intermediate	10	26,32	30	35,29	40	-8,98	
	Ensure pharmaceutical infrastructure is in line with legislative requirements.	Advance	17	44,74	29	34,12	46	10,62	
Document and record keeping management	Work according to the approved document management and recordkeeping systems.	Entry	13	34,21	35	41,18	48	-6,97	0,98
	Implement a system for documentation and recordkeeping for quality assurance purposes.	Intermediate	10	26,32	23	27,06	33	-0,74	
	Develop and update systems for documentation and recordkeeping for quality assurance purposes.	Advance	15	39,47	27	31,76	42	7,71	

In the pharmaceutical infrastructure needs assessment, female RPs mostly functioned at the entry level by participating in identifying pharmaceutical facility and equipment needs. Male RPs functioned mostly at the advanced level by identifying pharmaceutical facility and equipment needs and developing a plan to achieve and meet those needs.

When looking at the facilities and equipment assessment, the female RPs were on the entry level. They participated in monitoring the suitability of pharmaceutical facilities and equipment. Male RPs were on the advanced level because they showed that they managed pharmaceutical facilities and equipment.

When looking at procedures and policies management, females were on an entry level, with most females indicating that they worked according to the approved workplace procedures and policies. The males indicated that they implemented and monitored workplace procedures and policies, which showed they were on the intermediate level. Both male and female RPs complied with all the relevant time management requirements at the intermediate level.

When looking at the responses for pharmaceutical infrastructure management, females were on the intermediate level, with the majority indicating that they contributed to the improvement of the existing pharmaceutical infrastructure. The male respondents showed that they were on an advanced level, with the majority indicating they ensured pharmaceutical infrastructure was in line with legislative requirements.

Lastly, female RPs performed document and recordkeeping management at the entry level, with the majority indicating that they worked according to the approved document management and recordkeeping systems. Male RPs, however, showed they were on an intermediate level, with the majority indicating that they developed and updated systems for documentation and recordkeeping for quality assurance purposes.

Change management

The respondents were required to report the current demonstration of management competencies in two areas of change management in the South African pharmacy profession, namely management participation in change, and overcoming barriers to change. The results are reported in Table V: Change management.

Table V: Change management

	Items	Level	Male		Female		Total	Gap	p
			F	%	F	%			
Management participation in change	Participate in change management processes within the team.	Entry	14	36,84	37	43,53	51	-6,69	0,25
	Manage a change management process for the team.	Intermediate	7	18,42	24	28,24	31	-9,81	
	Contribute to and lead a change management process beyond the team/workplace or across disciplines.	Advance	17	44,74	24	28,24	41	16,50	
Overcoming barriers to change	Overcome internal barriers and self-limiting beliefs to change by analysing the climate and the readiness for change followed by measures to improve personnel growth and contribute to organisational success and outcomes.	Entry	7	18,42	37	43,53	44	-25,1	0,41
	Motivate staff to overcome barriers to change to drive organisational success and outcomes.	Intermediate	17	44,74	24	28,24	41	16,5	
	Develop strategies to inspire and motivate staff to overcome barriers to change to drive organisational success and outcomes.	Advance	14	36,84	24	28,24	38	8,6	

In the change management needs assessment, when looking at management participation in change, female RPs mostly functioned at the entry level by participating in change management processes within the team. Male RPs functioned mostly on the advanced level by contributing to and leading a change management process beyond the team/workplace or across disciplines.

When considering overcoming barriers to change, the female RPs were on the entry level, indicating that they overcame internal barriers and self-limiting beliefs to change by analysing the climate and the readiness for change, followed by measures to improve personnel growth and contribute to organisational goals. Male RPs were on the intermediate level, with the majority indicating that they motivated staff to overcome barriers to change to drive organisational success and outcomes.

Policy development

The respondents were required to report the current demonstration of management competencies in one area of policy development in the South African pharmacy profession, namely applying, implementing, developing and monitoring policies. The results are reported in Table VI: Policy development.

Table VI: Policy development

	Items	Levels	Male		Female		Total	Gap	P
			F	%	F	%			
Apply, implement, develop and monitor policies	Apply policies and SOPs.	Entry	10	26,32	31	36,47	41	-10,15	0,59
	Implement and monitor policies and SOPs.	Intermediate	17	44,74	37	43,53	54	1,21	
	Develop a policy framework and SOPs	Advanced	11	28,95	17	20,00	28	8,95	

The results in Table VI show that male and female participants mainly applied intermediate management competencies relating to policy development. They mostly concentrated on applying, implementing, developing and monitoring policies.

Table VII: Summary of results

	MALE			FEMALE		
	Entry	Intermediate	Advanced	Entry	Intermediate	Advanced
Human resource management		X		X		
Financial management		X		X		
Infrastructure management			X	X		
Change management			X	X		
Policy development		X			X	

Conclusions

When looking at human resource and financial management, female RPs were still at the entry level of competency, with male RPs predominantly showing that they were on an intermediate level. Under infrastructure and change management, female RPs functioned mostly at entry level while the male RPs show a strong leaning to advanced management competency. Policy development is the only area where male and female RPs both showed that they were on the intermediate level of competency, which may be due to the fact that most RPs strictly adhere to the Pharmacy Act and other legislation.

Referring to the data, most female RPs were at the entry level when measured using the competency standards, while the male respondents were between intermediate and advanced, even though the female respondents had been registered as pharmacists for longer and had more years of experience. The data indicates that the discrepancy could be attributed to management training as more male respondents had attended management training than their female counterparts, with 30.8% of males indicating they received some form of business training compared to only 7.1% of females.

Further research into additional management training and perhaps a dedicated course focusing on pharmacy management for RPs is supported by the data collected.

Recommendations

Based on the findings of the article, it is recommended that the SAPC consider developing management training for RPs to enhance their management skills. The study has shown there is a gap in the management competencies of RPs under the age of 35 in South Africa, which highlights the need for targeted training to address these deficiencies. Management training programmes could help the participants develop a better understanding of essential management functions, such as operations management, HR management, marketing management, financial management, and logistics management. Additionally, training could improve the participants' competencies in areas such as change management, strategic management and policy and relationship management. The development of these skills could help the participants perform their management duties more effectively.

This may be in the form of an RP-specific CPD or postgraduate diploma in management, similar to the current Primary Care Drug Therapy (PCDT) course currently being offered to pharmacists who would like to become prescribing pharmacists.

Conflict of interest

This study formed part of the dissertation Mr P Boonzaier completed for his Master's in Business Administration (MBA); there is no conflict of interest between any parties involved in the study.

Funding source

The study was self-funded by the student, Mr P Boonzaier.

Ethics declaration

This study was approved by the Ethics Committee of the NWU Business school prior to commencement of the data collection. Ethics number *NWU-00729-22-S4*.

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3.3 Manuscript 2

The manuscript titled “Current management needs for early career responsible pharmacists in South Africa” was prepared according to the journal submission guidelines for the PEJ (cf. Annexure 7) and submitted in November 2023 (cf. Annexure 8).

Current management needs for early career responsible pharmacists in South Africa

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Declaration of interest

This study formed part of an MBA qualification, there is no conflict of interest between any parties involved in the study.

Ethics declaration

This study was approved by the Ethics Committee of the NWU Business school as low risk prior to commencement of the data collection. Ethics number **NWU-00729-22-S4**

Current management needs for early career responsible pharmacists in South Africa

Abstract

Introduction

The South African Pharmacy Council (SAPC) outlined six competency standards highlighting five management functions essential for the effective management of pharmacies. These competencies are divided into different practice levels to be achieved by the pharmacist as their years of professional experience increase. Early career pharmacists could become responsible pharmacists (RPs) directly after registration as a pharmacist, expecting to perform competencies on an advanced level.

Methods

Quantitative research with a cross-sectional component falling in the positivist approach was used. A self-developed questionnaire was sent out to all RPs in South Africa under age 35 after ethical clearance was obtained to determine their current level of competency and potential management training needs.

Results

The data shows that early career RPs have several training needs across all management functions included in the competency standards for pharmacists in South Africa. The training needs arise as the current level of competency does not align with the expectations of the position of RP early in a career.

Conclusion

More research needs to be done on developing a management training course focusing on pharmacy management and establishing a minimum competency level for registration as an RP in South Africa.

Keywords

Competency standards; Early career pharmacist; Pharmacy management; Responsible pharmacist

Introduction

Under the provisions stipulated in the Regulations relating to the practice of pharmacy (Department of Health, 2000), a pharmacist is defined as someone who has successfully fulfilled the requirements of a Bachelor of Pharmacy (BPharm) qualification spanning four years at an institution of higher education duly accredited as a provider. After attaining the BPharm qualification, the prospective pharmacist is mandated to undertake a 365-day internship program under the guidance of a designated tutor, duly registered with the South African Pharmacy Council (SAPC), within a pharmacy officially recognised as a training facility. Upon the successful conclusion of the internship period, the pharmacist must embark on a one-year community service commitment, serving within a pharmacy duly registered with the SAPC. Four categories of pharmacy exist: manufacturing pharmacy, wholesale pharmacy, community or institutional pharmacy, and consultant pharmacy (Department of Health, 2000). Pharmacists are allowed to work in these pharmacies and conduct the duties of a pharmacist as outlined by the Pharmacy Act (53 of 1974) and Rules relating to Good Pharmacy Practice (GPP) (SAPC, 2004).

The current statistics of pharmacies in South Africa and the distribution of pharmacists' genders are included in Table I.

Insert Table I.

It is mandated by the Regulation (Department of Health, 2000) that every pharmacy shall operate under the direct personal supervision of a responsible pharmacist (RP). An RP is defined in the Pharmacy Act (53 of 1974) as *“a natural person who is a pharmacist and who shall be responsible to the council [SAPC] for complying with all the provisions of this [Pharmacy] Act and other legislation applicable to services which specially pertain to the scope of practice of a pharmacist, and the legislation applicable to the pharmacy which is under his or her supervision”* (Department of Health, 2000). In scenarios where the same owner or company owns more than one pharmacy, they must ensure that an RP is appointed for each pharmacy, wherein or from which operations will occur (Department of Health, 2000).

(Erasmus *et al.*, 2020:55) identified five critical management functions for effective management: operation, human resources, marketing, finance, and logistics. The SAPC outlined six competency standards related to management that an entry-level pharmacist must understand when graduating with a Bachelor of Pharmacy qualification (SAPC, 2018). The management module in the Bachelor of Pharmacy curriculum offered by nine South African pharmacy schools consists of several themes, including fundamental change, financial, human resource, logistics, marketing, quality improvement, risk, strategic and policy development, relationship, laws and regulations, with an average of 18 credits allocated to each module (NWU, 2021; RU, 2017; Wits, 2021). These competency standards meet the basic requirements for an entry-level pharmacist who only needs to know what

these functions entail but does not have to actively perform any management functions until they reach the intermediate level. The competency standards expect pharmacists to execute management skills at the intermediate or advanced level, typically taking more than three or seven years of practice, respectively.

In South Africa, a pharmacist can become an RP in their first year of practice post internship upon registration without any further qualifications or years of experience. This is different from what is experienced in other countries. In Ukraine and Poland, postgraduate training or further studies in pharmacy management are required to become a pharmacy manager or RP (WHO, 2019). In Spain, a pharmacist must have at least five years of experience as a pharmacist in a pharmacy before applying to become a pharmacy manager (WHO, 2019).

Therefore, this research determined the current management training needs and areas of development for early career pharmacists under the age of 35 in South Africa.

Methods

Research Approach

Quantitative research with a cross-sectional component falling in the positivist approach was used. Questionnaires were used to collect the relevant data. The survey aimed to investigate the current management needs and areas of development for RPs under the age of 35 in South Africa. This method was chosen to ensure the study was conducted correctly and reliably in the given period (Bryman *et al.*, 2021; 322).

Sample

The target population for this study was registered RPs in the South African pharmacy profession. This sample was purposefully chosen based on the age of the population group. A total of 956 questionnaires were distributed; 188 were received, of which 123 were suitable for further analysis. The response rate was 18%. The demographic characteristics of the participants are presented in Table II.

Insert Table II

Measuring Instrument

A self-developed measurement was used to determine the current management needs and areas of development of RPs under 35. Biographical information was collected to describe the sample population. Five management competency standards were investigated, namely human resource (4 items), financial (4 items), pharmaceutical infrastructure (6 items), change (2 items), and policy development (1 item). Under the competency requirements, the responses were measured on two of the three levels of competency, intermediate and advanced, as all graduates are already at the entry-level when they enter the profession. The self-developed measure was distributed to subject matter experts to ensure face and content validity before distribution to the target population.

Research Procedure

Ethical clearance to perform the study was obtained from the North-West University's Business School (NWU-00729-22-A4) before the execution thereof. The questionnaires were distributed electronically with the help of a colleague who acted as a gatekeeper. The questionnaire was accompanied by an information leaflet explaining information essential for the participant's consideration before requesting their informed consent to participate in the

research study. Participation was voluntary, and confidentiality of data was maintained. The research conforms to all ethical rules and regulations on empirical scientific research.

Statistical analyses

The data collected from the questionnaires was used to conduct the study and formulate conclusions. Statistical analysis was done using the Statistical Package for the Social Sciences (SPSS). Analysis and numerical data were used to find patterns and averages to make predictions and form conclusions (Ragab & Arisha, 2018:8). The reliability and validity will be determined using exploratory factor analysis and Cronbach's alpha coefficients. Pearson's correlation analyses and hierarchical regression analyses were applied to determine the relationships between the variables in this study. Descriptive statistics (i.e., frequencies, means, standard deviation, skewness, and kurtosis) were used to analyse the data. The factor structure of the measuring instrument was determined by using a combination of exploratory and confirmatory factor analyses. The reliability of the questionnaire was calculated by using the guidelines of Cohen of $\alpha \geq 0.70$ as an indication of the reliability of the data received (Ragab & Arisha, 2018:8). The four-point Likert scale offers options for 'Definitely do not need training', 'Do not need training', 'Do need training' and 'Definitely do need training' and allowed for a more accurate measurement of the data.

Results and Discussion

The average age of participants was 30 years, with 3 to 7 years of professional experience as a pharmacist but less than 3 years of experience as an RP. Most participants were female, representing the current overall trend in pharmacy nationally (SAPC, 2023a). According to the competency standards for pharmacists, a pharmacist with more than 7 years of experience

would ideally be at an advanced level of practice that aligns more with an RP's duties (SAPC: 2018). The data shows that most participants accepted the role of an RP when they were still entry or intermediate-level pharmacists. Most participants work in the community pharmacy sector, which should not be a surprise since most pharmacies in South Africa are registered as community pharmacies (SAPC, 2023b). A few participants indicated that they have other qualifications besides the BPharm degree, which explains why a significant proportion of the research participants said that they lack business expertise apart from what was included in the BPharm degree or other entrepreneurial experience. Participants who completed this questionnaire were from all nine pharmacy schools in South Africa.

Human resource management

The findings on the current management training needs regarding human resource management are shown in Table III. A reliability analysis was conducted to ascertain the overall reliability of the human resources management scale. The data demonstrate a high level of reliability, at 0.884. The data was subjected to additional analysis through descriptive statistics.

Insert Table III

In general, the results demonstrate that the participants require additional training. Some of the areas in which RPs have identified a need for management training are *monitor adherence to relevant human resources management legislation, e.g., Labour Relations Act and Basic Conditions of Employment Act (Q4; mean: 2,8), develop and train pharmacy personnel in basic human resources management legislation, e.g., Labour Relations Act and Basic Conditions of*

Employment Act (Q8; mean: 2,76), and *review performance management policies and processes* (Q7; mean: 2,6).

Areas with a lower need for training included *identify staff training needs, facilitate appropriate training opportunities, and participate in continuing professional development* (Q6; mean: 2,37), *participate in the provision of staff training and continuing professional development* (Q2; mean: 2,38) and *effectively manage pharmacy personnel under personal supervision* (Q1; mean: 2.44).

Table III shows that the two primary areas where participants need further management training are performance management and labour relations, both complex and sensitive aspects of the management process, potentially requiring a pharmacist to be at a more mature level of practice to address these aspects.

Financial management

The respondents were required to report the current demonstration of management in four specific domains of financial management within the pharmacy profession in South Africa. These domains include medical finance, budgeting, legislative prescriptions, and pharmaco-economic principles and assessments. The findings are presented in Table IV. The findings indicate a high level of dependability, with an α -coefficient of 0.839.

Insert Table IV

RPs indicated that they have management training needs in *develop and effectively analyse and manage financial data and budgets* (Q6; mean: 2,72) as part of budgeting and *apply the principles of pharmacoeconomic assessments* (Q4 and Q8; mean: 2,64) under pharmaco-economic principles and assessments, and *determine dispensing and professional fees to be*

charged in line with legislation (Q5; mean: 2.6) as a competency under medical finance. The selling of medicine cannot be compared with selling other consumer goods, as medicines are not an ordinary commodity of trade. Legislation restricts medicines' purchase and selling price through Single Exit Price (SEP) determined by the National Department of Health (Department of Health, 2005). The only margin of profit that pharmacists may add to the SEP price is the logistics fee for distributing medicines and the dispensing fee charged at the point of dispensing medicines to patients, both regulated by the National Department of Health (Department of Health, 2023). Therefore, it requires more skills from the RP to ensure that the pharmacy remains profitable while complying with legislation.

Participants indicated that they need less training in *monitor patient prescriptions claims submitted to health funders to ensure optimum use of patient benefits* (Q1; mean: 2.24) or to *monitor/ensure adherence to all relevant legislative prescripts* (Q3; mean: 2.31/Q7; mean: 2.33). This is understandable, given that most participants work in a community or hospital pharmacy dispensary and submit daily claims to medical aid schemes.

Pharmaceutical infrastructure management

The participants were required to provide information on their present management capabilities in six domains of pharmaceutical infrastructure management within the pharmacy profession in South Africa; namely pharmaceutical infrastructure needs assessment, facilities and equipment assessment, procedures and policies management, time management, pharmaceutical infrastructure management and document and record keeping management. Table V presents the findings regarding management training requirements and development areas. The reliability value of 0.945 is deemed exceptionally high due to Cronbach's alpha

coefficient being greater than 0.6 (Field, 2015). Additional analysis of the results was conducted utilising descriptive statistics.

Insert Table V

The results overall indicate that the participants show a need for training. Some areas where RPs indicated they have higher management training needs are *develop and update systems for documentation and recordkeeping for quality assurance purposes* (Q12; mean: 2,48), *develop and review workplace procedures and policies as required* (Q9; mean: 2,46) and *contribute to the improvement of the existing pharmaceutical infrastructure* (Q5; mean: 2.44).

An RP is legally accountable to SAPC for all aspects of the pharmacy, including the infrastructure of the pharmacy. The GPP (SAPC, 2004) contains several minimum standards concerning infrastructure, which SAPC inspects for compliance. The RP could be charged for unprofessional conduct without compliance with minimum standards.

Pharmaceutical infrastructure needs assessment (Q1; mean: 2.20 and Q7; mean: 2.33), facilities and equipment assessment (Q2; mean: 2.19 and Q8; mean: 2.23) and time management (Q4; mean: 2.31 and Q10; mean; 2.39) most participants indicated as areas where they feel that less training is necessary.

Change management

The results from the questionnaire questions on change management demonstrate a very high dependability of 0.91.

Insert Table VI

Participants show a preference for training. Areas where a need for training was highlighted include *develop strategies to inspire and motivate staff to overcome barriers to change in order to drive organisational success and outcomes* (Q4; mean: 2,61) and *contribute to and lead a change management process beyond the team/workplace or across disciplines* (Q3; mean: 2,58). Both competencies are on the advanced level of practice, which will ideally only be achieved after 7 years of practice.

Participants did feel more comfortable to *manage a change management process for the team* (Q1; mean: 2.49) and to *motivate staff to overcome barriers to change in order to drive organisational success and outcomes* (Q2; mean: 2.45), which both is intermediate level competencies, aligned with the level of practice indicated by most participants in this research.

When comparing the need for management training with the competency level participants perceive themselves, Boonzaier *et al.* (2023: 40) reported that it was primarily female participants who indicated that their current level of competency regarding change management is at entry-level, whereas male participants reported to be on an intermediate or advance level of practice.

Policy development

The respondents were required to report the current demonstration of management competencies in one area of policy development in the South African pharmacy profession to apply, implement, develop and monitor policies. The results are reported in Table VII. A reliability analysis was done to determine the overall reliability of the policy development

scale, resulting in an excellent reliability of 0,819. The results were further analysed using descriptive statistics.

Insert Table VII

Overall, the results indicate that the participants show a higher need for training when they must *develop a policy framework and SOPs* (Q2; mean: 2.56) than for *implement and monitor policies and SOPs* (Q1; mean: 2.33). When comparing the two competencies with the Bloom's revised (NWU, 2023) taxonomy used to categorise learning, *develop* could be found on the highest level of the taxonomy expecting participants to create content. On the other hand, to *implement and monitor* requires a lower cognitive level as participants only apply what is already known. In this case, participants should be encouraged to exercise higher levels of cognitive thinking to enhance their competencies in terms of policy development.

Experience versus training needs

"Multivariate analysis of variance (MANOVA) is an extension of the univariate analysis of variance (ANOVA)" (Statistics Solutions, 2022). For ANOVA, one continuous dependent variable by an independent grouping variable is examined for statistical differences. On the other hand, MANOVA extends this analysis by considering multiple continuous dependent variables and bundling them into a weighted linear combination or composite variable.

Upon reaching or falling below the conventional threshold of 0.05, the *p*-value is traditionally construed as indicative of statistical significance. Conversely, should the *p*-value surpass 0.05, the observed outcome is categorised as non-significant. The study's findings suggest that no statistically significant differences were discerned among the variables when considering the RP's professional years.

Insert Table VIII

Upon analysing the data in Table VIII, it becomes evident that RPs with 0 to 3 years of experience (entry level) recognise the necessity of more training. RPs with over 3 years of experience do not perceive the need for extra training similarly.

Areas where RPs between 0 and 3 years feel they need training are human resource, financial, change management and policy development. The RPs with 3- and 7-year experience need more training in pharmaceutical infrastructure management. Participants with 3 to 7 years of experience have a second highest interest in pursuing more training for the other four management areas. This aligns with the anticipated behaviour of pharmacists actively engaged in continuous learning and professional development over several years in practice.

Conclusions

Continued education (CE) cannot be underestimated in a pharmacy. CE helps anyone stay updated with the latest in their respective fields (Wheeler & Chisholm-Burns, 2018:198). With curriculums in pharmacy schools expanding to include ever-changing development in the pharmacy profession, the management component is being left behind, causing many pharmacists who are entering the practice for the first to struggle to manage and lead (Mospan, 2017:171).

Based on the data, it can be observed that a significant number of RPs acknowledge the necessity of further training to enhance their performance. However, there are specific domains, such as staff training and development, legislative prescriptions, pharmaceutical infrastructure needs assessment, facilities and equipment assessment and time management, in which participants perceive that additional training is a lesser priority for training, especially

when looking at RPs who have been pharmacists for 3 years and more. This phenomenon could be attributed to the adequacy of individuals' day-to-day responsibilities in preparing them for such positions or to their perception of the lack of necessity for certain managerial activities in their everyday roles. The observed gap could potentially be attributed to the fact that certain respondents who participated in the survey had prior exposure to management training or had undergone some business education.

The gathered data substantiates the significance of supplementary management training for RPs and the necessity for a specialised course centred on pharmacy management.

Recommendations

The research's findings suggest that the SAPC should look into implementing management training programs for RPs to augment their managerial competencies. The research findings indicate the presence of a deficiency in the managerial competencies of individuals under the age of 35 who hold the role of RPs in South Africa. This underscores the necessity for focused training interventions aimed at addressing these limitations. Management training programs enhance participants' comprehension of fundamental management activities, including operations, human resources, marketing, financial, and logistics management. Furthermore, implementing training programs can improve the participants' proficiencies in various domains, including change management, strategic management and policy, quality improvement principles, and relationship management. Developing these skills enhances the participants' ability to carry out their managerial responsibilities more effectively.

One option for further professional development in this area could be pursuing a specialised Continuing Professional Development (CPD) program or a postgraduate diploma in management explicitly designed for RPs.

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Table I: Statistics on the distribution of registered pharmacies and pharmacists according to gender in South Africa.

Registered pharmacies	n	Gender (pharmacists)	n
Academic institution	9	Female	11389
Community pharmacies	3977	Male	5948
Consultant pharmacies	6		
Private institutional pharmacies	315		
Public institutional pharmacies	623		
Manufacturing pharmacies	278		
Private wholesale pharmacies	177		
Public wholesale pharmacies	10		

Table II: Demographic characteristics of the sample population.

Survey questions		RPs	
		n	%
Highest qualification	Bachelor's Degree	103	83,3
	Postgraduate	16	13
	Other	4	3,8
Where did you study BPharm?	Nelson Mandela University	12	9,0
	North-West University	65	48,5
	Rhodes University	10	7,5
	Sefako Makgatho Health Sciences University	3	2,2
	Tshwane University of Technology	2	1,5
	TUT & SMU Collaboration	4	3,0
	University of KwaZulu-Natal	13	9,7
	University of Limpopo (Turfloop Campus)	9	6,7
	University of the Western Cape	10	7,5
	University of Witwatersrand	6	4,5
Years of work as a pharmacist	0 to 3 years	32	28,7
	Between 3 and 7 years	56	42,3
	More than 7 years	35	29,1
Years of work as an RP	0 to 3 years	93	75,3
	Between 3 and 7 years	23	20,6
	More than 7 years	7	4,2
	Corporate community pharmacy	51	36,8

Category of pharmacy RPs work in	Hospital pharmacy private	10	7,4
	Hospital pharmacy public	12	11,7
	Independent community pharmacy	41	29,4
	Manufacturing pharmacy	5	4
	Other (not listed)	5	3,4
	Wholesale pharmacy private	9	6,8
	Wholesale pharmacy public	1	0,5
Business management training received apart from modules in BPharm degree?	No	105	81
	Yes	18	19
Any entrepreneurship experience	No	100	78,8
	Yes	23	21,3

Table III: Human resource management training needs

	Competency standards (question order as per questionnaire distributed to participants)	Mean	Definitely do not need training	Do not need training	Do need training	Definitely do need training
	Human resource management ($\alpha = 0.884$)	2,55	1	2	3	4
Staff management	Effectively manage pharmacy personnel under personal supervision. (Q1)	2,44	18	42	54	9
	Identify human resources requirements and manage human resources effectively. (Q5)	2,55	12	40	62	9
Staff training and Development	Participate in the provision of staff training and continuing professional development. (Q2)	2,38	14	53	51	5
	Identify staff training needs, facilitate appropriate training opportunities and participate in continuing professional development. (Q6)	2,35	17	52	48	6
Performance management	Conduct staff assessments or appraisals in line with the performance management policy. (Q3)	2,53	12	45	55	11
	Review performance management policies and processes. (Q7)	2,60	13	35	63	12
Labour relations	Monitor adherence to relevant human resources management legislation, e.g., Labour Relations Act and Basic Conditions of Employment Act. (Q4)	2,80	10	23	71	19

	Develop and train pharmacy personnel in basic human resources management legislation, e.g., Labour Relations Act and Basic Conditions of Employment Act. (Q8)	2,76	10	26	71	16
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Table IV: Financial management training needs.

	Competency standards (question order as per questionnaire distributed to participants)	Mean	Definitely do not need training	Do not need training	Do need training	Definitely do need training
	Financial management ($\alpha = 0.839$)	2,47	1	2	3	4
Medical finance	Monitor patient prescription claims submitted to health funders to ensure optimum use of patient benefits. (Q1)	2,24	25	52	38	8
	Determine dispensing and professional fees to be charged in line with legislation. (Q5)	2,60	12	40	56	15
Budgeting	Monitor income and expenditure in line with budget prescripts. (Q2)	2,49	17	46	43	17
	Develop and effectively analyse and manage financial data and budgets. (Q6)	2,72	6	39	62	16
Legislative and prescriptions	Monitor adherence to all relevant legislative prescripts. (Q3)	2,31	19	51	49	4
	Ensure adherence to all relevant legislative prescripts. (Q7)	2,33	19	52	45	7
Pharma-economic principles	Apply the principles of pharmacoeconomic assessments. (Q4 & Q8)	2,64	14	25	75	9

Table V: Pharmaceutical infrastructure management training needs.

	Competency standards (question order as per questionnaire distributed to participants)	Mean	Definitely do not need training	Do not need training	Do need training	Definitely do need training
	Pharmaceutical infrastructure management ($\alpha = 0.945$)	2,33	1	2	3	4
Pharmaceutical Infrastructure	Identify pharmaceutical facility and equipment needs. (Q1)	2,20	19	64	36	4
	Identify pharmaceutical facility and equipment needs and develop a plan to achieve and meet the needs. (Q7)	2,33	16	55	47	5
Facilities and equipment assessment	Monitor the suitability of pharmaceutical facilities and equipment. (Q2)	2,19	21	62	36	4
	Manage pharmaceutical facilities and equipment. (Q8)	2,23	19	61	39	4
Procedures and policies management	Implement and monitor workplace procedures and policies. (Q3)	2,37	12	59	47	5
	Develop and review workplace procedures and policies as required. (Q9)	2,46	13	46	59	5
Time management	Manage, prioritise, and organise workflow and demonstrate time management skills. (Q4)	2,31	17	57	43	6
	Develop and review workflow systems to manage, prioritise, organise daily work, and demonstrate time management skills. (Q10)	2,39	13	55	49	6

Pharmaceutical infrastructure	Contribute to the improvement of the existing pharmaceutical infrastructure. (Q5)	2,44	14	47	56	6
	Ensure pharmaceutical infrastructure is in line with legislative requirements. (Q11)	2,39	15	51	51	6
Document and record keeping management	Implement a system for documentation and recordkeeping for quality assurance purposes. (Q6)	2,36	15	52	53	3
	Develop and update systems for documentation and recordkeeping for quality assurance purposes. (Q12)	2,48	13	45	58	7

Table VI: Change management training needs.

	Competency standards (question order as per questionnaire distributed to participants)	Mean	Definitely do not need training	Do not need training	Do need training	Definitely do need training
	Change management ($\alpha = 0.911$)	2,53	1	2	3	4
Management participation in change	Manage a change management process for the team. (Q1)	2,49	13	46	55	9
	Contribute to and lead a change management process beyond the team/workplace or across disciplines. (Q3)	2,58	14	36	61	12
Overcoming barriers to change	Motivate staff to overcome barriers to change in order to drive organisational success and outcomes. (Q2)	2,45	15	48	50	10
	Develop strategies to inspire and motivate staff to overcome barriers to change in order to drive organisational success and outcomes. (Q4)	2,61	13	36	60	14

Table VII: Policy development training needs.

	Competency standards (question order as per questionnaire distributed to participants)	Mean	Definitely do not need training	Do not need training	Do need training	Definitely do need training
	Policy development ($\alpha=0.819$)	2,45				
Apply, implement, develop and monitor	Implement and monitor policies and SOPs. (Q1)	2,33	22	49	42	10
	Develop a policy framework and SOPs. (Q2)	2,59	15	33	63	12

Table VIII: Experience versus training needs.

	Entry level 0 to 3 years	Intermediate level 3 to 7 years	Advanced level More than 7 years	<i>p</i> (sig)
Human resource management	2,67	2,54	2,46	0,34
Financial Management	2,53	2,43	2,5	0,69
Pharmaceutical infrastructure management	2,34	2,36	2,32	0,95
Change management	2,66	2,48	2,49	0,48
Policy development	2,64	2,42	2,34	0,27

CHAPTER 4 CONCLUSIONS AND RECOMMENDATIONS

4.1 Introduction

In this chapter, the conclusion of the results discussed in Chapter 3, as included in manuscript 1 (cf. 3.2) and 2 (cf. 3.3), are presented according to the research objectives mentioned in Chapter 1 (cf. 1.6). The researcher makes further recommendations that could resolve the management training needs of young responsible pharmacists under the age of 35 years. The chapter concludes with possible limitations encountered during this study.

4.2 Evaluation

The study employed the methodology delineated in Chapter 1 (cf. 1.7). The research questions were addressed through an exhaustive literature review and the distribution of questionnaires to RPs under 35 years. All research objectives were aligned with the corresponding research questions and were effectively achieved. The primary objective of the study, namely *Investigating the management training needs of responsible pharmacists under 35 years in South Africa*, was successfully fulfilled.

To recap, the research questions were as follows:

1. What is the current management skills level of RPs under 35 years in South Africa?
2. What are the day-to-day management issues of an RP?
3. What are the management needs of RPs under 35 years in South Africa?
4. What can be done to ensure RPs under 35 years gain the necessary management skills to move from entry/intermediate to an advanced level?

To achieve the aim and answer the study's research questions, the following objectives will be pursued.

1. To determine the current management skill level of RPs under 35 years in South Africa. This objective addresses research question 1.
2. To determine the day-to-day management issues of an RP. This objective addresses research question 2.
3. To determine the management needs of RPs under 35 years in South Africa. This objective addresses research question 3.
4. To identify areas of management skills that RPs under 35 years need to move from entry/intermediate to an advanced level. This objective addresses research question 4.

4.3 Current management skills

The first objective was to determine the current management skill level of RPs under 35 years in South Africa.

4.3.1 Conclusion

After reviewing and analysing the general and demographic data gathered from the questionnaires, the following conclusions were reached, as reported on in manuscript 1 (cf. 3.2):

Human resource management:

- **Staff management:** Female RPs predominantly functioned at the entry level by contributing to the effective management of pharmacy staff as opposed to male RPs who predominantly functioned at the advanced level by identifying HR requirements and managing HR effectively.
- **Staff training and development:** Both male and female RPs exhibit behaviours in keeping with the entry level.
- **Performance management:** Both male and female RPs displayed behaviours linked to competency standards at the intermediate level.
- **Labour relations:** Both male and female RPs were still at the entry level of competency.

Financial management:

- **Medical finance:** Male and female participants mainly applied entry-level management competencies.
- **Budgeting:** Female RPs mostly functioned at the entry level by working according to an approved budget as opposed to male RPs who functioned predominantly on the intermediate level by monitoring income and expenditure in line with budget prescriptions.
- **Legislative prescriptions:** Both male and female RPs complied with all the relevant legislative requirements at the entry level.
- **Pharmaco-economic principles and assessments:** Both male and female RPs performed cost-benefit analyses at the entry level. However, it was found that male RPs also applied the principles of pharmacoeconomic assessments on an intermediate level, but not yet on an advanced level.

Pharmaceutical infrastructure management:

- **Pharmaceutical infrastructure needs assessment:** Most female RPs measured themselves at the entry level by participating in identifying pharmaceutical facility and equipment needs. On the other hand, male RPs indicated their functioning at the advanced

level by identifying pharmaceutical facility and equipment needs and developing a plan to achieve and meet those needs.

- **Facilities and equipment assessment:** Female RPs rated themselves on the entry level as opposed to male RPs who practised on the advanced level.
- **Procedure and policy management:** Females were on an entry level, indicating that they worked according to the approved workplace procedures and policies. The males indicated that they implemented and monitored workplace procedures and policies at the intermediate level.
- **Time management:** Both male and female RPs complied with all the relevant time management requirements at the intermediate level.
- **Pharmaceutical infrastructure management:** Females ranked themselves on the intermediate level, with the majority indicating that they contributed to the improvement of the existing pharmaceutical infrastructure. On the other hand, male respondents indicated that they ensured pharmaceutical infrastructure was in line with legislative requirements, as required on an advanced level.
- **Document and recordkeeping management:** Female RPs performed at the entry level, with the majority indicating that they worked according to the approved document management and recordkeeping systems. Male RPs, however, developed and updated systems for documentation and recordkeeping for quality assurance purposes (intermediate level).

Change management:

- **Management participation in change:** Female RPs mostly functioned at the entry level by participating in change management processes within the team as opposed to male RPs, who functioned mostly by contributing to and leading a change management process beyond the team/workplace or across disciplines (advanced level).
- **Overcoming barriers to change:** Female RPs were on the entry level with male RPs rating themselves on the intermediate level, with the majority indicating that they motivated staff to overcome barriers to change to drive organisational success and outcomes.

Policy development:

- **Apply, implement, develop, and monitor policies:** All participants mainly applied intermediate management competencies relating to policy development.

The first objective, which was to determine the current management skill level of RPs under 35 years in South Africa, **was achieved**.

4.3.2 Recommendations

The following recommendations based on the investigation and, as reported in manuscript 1 (cf. 3.2), could be made:

- Recommend to the SAPC the development of focused management training for RPs to enhance their management skills, better understand the essential management functions required when managing a pharmacy and reduce the gap in the management competencies of RPs under the age of 35 in South Africa, which highlight the need for targeted training to address these deficiencies.
- Investigate whether the self-reporting by female RPs is objective (have lower-level competencies) or out of modest behaviour, since for most competencies, female RPs rated themselves lower than male RPs.
- Investigate whether the self-reporting by male RPs is objective (have high-level competencies) or out of self-confidence behaviour, since for most competencies, male RPs rated themselves higher than female RPs.
- Recommend to the SAPC to review the currently BPharm degree to see if the pharmacy management component is sufficient to prepare pharmacists on entry level for the responsibilities of an RP.

4.4 Day to day management issues

The second objective was to determine the day-to-day management issues of RPs under 35 years in South Africa.

4.4.1 Conclusion

After reviewing and analysing the general and demographic data gathered from the questionnaires, the following conclusions were reached, as reported on in manuscript 1 (cf. 3.2):

- Although management training is included in the BPharm curriculum, it aims to deliver a generalist pharmacist and not a management specialist.
- When a pharmacist is appointed as an RP early in their career, they might have trouble executing their duties as they may not yet have been exposed to or performed at the appropriate level of practice in terms of knowledge, skills, and behaviour.
- It is evident that female RPs participants in this study are mostly at entry level in terms of their competencies as opposed to male RPs who reported to be on either the intermediate or advanced level.

- Significantly, more male RPs had attended management training than their female counterparts, with 30.8% of males indicating they received some form of business training compared to only 7.1% of females.

The second objective, which was to determine the day-to-day management issues of an RP under 35 years in South Africa, **was achieved**.

4.4.2 Recommendations

The following recommendations could be made:

- Encourage young pharmacy professionals to engage in continuous education and training regarding management to be effective managers in an ever-changing business environment.
- Employers should specify years of experience and potential additional management training needed for RP positions to ensure all candidates can effectively execute the management duties expected of an RP.
- Female pharmacists should be encouraged to review their level of competency in the workplace and ensure they do not lag behind their peers.

4.5 Management needs

The third objective was to determine the management needs of RPs under 35 years in South Africa.

4.5.1 Conclusion

After reviewing and analysing the general and demographic data gathered from the questionnaires, the following conclusions were reached, as reported in manuscript 2 (cf. 3.3):

Human resource management:

- The two main areas where participants have a need for further management training are performance management and labour relations.

Financial management:

- Budgeting and pharmacoeconomic principles and assessment were listed as the two areas with the highest training needs.

Pharmaceutical infrastructure management:

- Participants indicated that the two main areas with the highest training needs are document and recordkeeping management, and pharmaceutical infrastructure.

Change management:

- Managing participation in change was regarded as the competency where participants needed the most training.

Policy development:

- Participants indicated that they need more training in the development of policies than in the implementation thereof.

The third objective, which was to determine the management needs of RPs under 35 years in South Africa, **was achieved**.

4.5.2 Recommendations

The following recommendations could be made:

- In the competency standards (SAPC, 2018:34), both the intermediate and advanced behavioural statements for pharmacoeconomic principles and assessments are the same, namely *apply the principles of pharmacoeconomic assessment*. It would have been more appropriate to list the behaviour at the advanced level to *develop pharmacoeconomic assessment criteria*.
- Currently, there is no mechanism in place for RPs to measure their competency from time to time. More emphasis should be placed on motivating RPs to develop their competency and progression through the different competency levels.

4.6 Areas of improvement

The fourth objective was to identify areas of management skills that RPs under 35 years need to move from the entry/intermediate to the advanced level.

4.6.1 Conclusion

After reviewing and analysing the general and demographic data gathered from the questionnaires, the following conclusions were reached, as reported in manuscript 2 (cf. 3.3):

- Human resource, financial, change management and policy development: The highest need for training was from entry-level RPs.
- Pharmaceutical infrastructure management: The highest need for training was from intermediate-level RPs.

The fourth objective, which was to identify areas of management skills that RPs under 35 years need to move from the entry/intermediate to the advanced level, **was achieved**.

4.6.2 Recommendations

The following recommendations could be made:

- RPs must monitor their level of practice and ensure that their level of competency advances in line with their years in practice.
- A minimum level of competency should be met by potential RP candidates prior to being appointed in such positions.

4.7 Limitations

The following limitations should also be taken into consideration when formulating the above conclusions and implementing the recommendations.

- The study encountered challenges in obtaining timely responses from the research population within the stipulated timeframe. A total of 956 questionnaires were distributed, of which only 188 completed questionnaires were received back. Only 123 received questionnaires were suitable for further analysis. The response rate was 18%. A higher response rate would have enriched the data more.
- The raw data collected from study participants by the researcher is assumed to be correct and accurate.
- Unfortunately, apparently, certain employers prohibit participation in research surveys unless reviewed and cleared by company management. This might have impacted the response rate as participation in this research study was prohibited or not even considered given the managerial red tape associated with participating.

It would have been interesting to include a question in the questionnaire on whether the participants have an interest in management development, or a desire to become a pharmacy manager or RP personally. This would have provided context as to whether young RPs under the age of 35 accept such positions for the fulfilment they bring or for the increased salary associated with increased responsibilities.

4.8 Recommendations for further research

Limited literature and research exist concerning the management needs of RPs in South Africa. The completion of this study would have posed considerable challenges without the valuable

contributions of the research participants. This scarcity of information may be attributed to the regulatory landscape in South Africa regarding pharmacy management.

Subsequent researchers are encouraged to explore this research topic, including the regulatory framework and potential tools to enhance the management practices of RPs in overseeing their pharmacies more effectively. In addition, research on the difference in RP role and responsibility based on the various sectors of pharmacy could also be explored as the legislation and competency standards for pharmacists does not differ in this regard.

Some research participants noted at the end of the questionnaire, when asked for any other information, that they need training in how to deal with patients (customers), especially more difficult patients and their potentially abusive approach in dealing with the pharmacist. Although the softer skills, such as communication, are included in the competency standards, they were not specifically part of this study. It is, however, notable that further investigation is needed in this regard.

4.9 Chapter conclusion

In this chapter, the objectives stated in Chapter 1 (cf. 1.6) of this study were discussed and answered according to the results in Chapter 3. Conclusions were reached for every objective of this study from the empirical investigation. A few recommendations were made to be considered and implemented by the SAPC, young pharmacy professionals, especially females and employers. Some limitations of this study were mentioned and included in this chapter.

All four objectives have been achieved and reached during this study and it was concluded by means of conclusions and recommendations in Chapter 4. Therefore, the aim of this study (cf. 1.5), which was to investigate the management training needs of RPs under 35 years in South Africa and how these needs can best be addressed, has been answered accordingly.

It is therefore concluded that the objectives of this study have been achieved.

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ANNEXURES

Annexure 1: Questionnaire

Section A: Demographic information

All information contained in Section A will only be used to compile a demographic profile of the sample. Please mark each question in the appropriate box by clicking on it. Please ensure only one block is marked.

A1. What is your gender?

Male Female Other

A2. What is your age in years?

23 24 25 26 27 28
29 30 31 32 33 34
35

If you are older than 35, you should not continue with this survey.

A3. Please indicate in which institution you obtained your BPharm degree?

Nelson Mandela University	TUT & SMU Collaboration
North-West University	University of Limpopo
Obtained Internationally	University of Kwazulu-Natal
Rhodes University	University of the Western Cape
Sefako Makgatho Health Sciences University (SMU)	University of Witwatersrand
Tshwane University of Technology (TUT)	Other

A4. What is your highest level of educational qualification?

BPharm MPharm / MSc PharmD
PhD Other

A5. Please indicate the number of years that you have been working as a pharmacist.

0 to 3 years Between 3 and 7 years More than 7 years

A6. Please indicate the number of years that you have been working as an RP.

1 year 2 years 3 years 4 years 5 years 6 years
7 years 8 years 9 years 10 years 11 years 12 years
12 years+

A7. Please indicate the type of pharmacy that you are working in.

Academic institution	Independent community pharmacy
Administration	Manufacturing pharmacy
Consultant pharmacy	Wholesale pharmacy private
Corporate community pharmacy	Wholesale pharmacy public
Hospital pharmacy private	Other
Hospital pharmacy public	

A8. Please indicate whether you have any other business management experience in addition to managing a pharmacy.

Yes

No

A9. Please indicate whether you have received any additional entrepreneurial or business management training in addition to your BPharm degree. If yes, please indicate the nature of your training in the text block provided. (For instance, a module, a programme, or other courses)

No

Yes

If yes, please indicate the nature of your training in the space provided.

Sections B: Current level of competency

This section will investigate your current level of participation in different aspects of management.

For each question below, please indicate which one of the three practice advancement levels listed you currently identify yourself with, as well as your level or practice. Please remember that there is no anticipated answer or expectation of where you should be; please answer all questions as honest as possible.

Please ensure only one block is marked.

Item no.	Entry-level	Intermediate	Advanced
Human resources management			
1	Contribute to the effective management of pharmacy personnel.	Effectively manage pharmacy personnel under personal supervision.	Identify human resources requirements and manage human resources effectively.
2	Undertake continuing professional development.	Participate in the provision of staff training and continuing professional development.	Identify staff training needs, facilitate appropriate training opportunities and participate in continuing professional development.
3	Conduct self-assessments or appraisals in line with the performance management policy.	Conduct staff assessments or appraisals in line with the performance management policy.	Review performance management policies and processes.
4	Adhere to basic human resources management legislation, e.g., Labour Relations Act and Basic Conditions of Employment Act.	Monitor adherence to relevant human resources management legislation, e.g., Labour Relations Act and Basic Conditions of Employment Act.	Develop and train pharmacy personnel in basic human resources management legislation, e.g., Labour Relations Act and Basic Conditions of Employment Act.
Financial management			
1	Submit patient prescription claims to health funders to ensure optimum use of patient benefits.	Monitor patient prescription claims submitted to health funders to ensure	Determine dispensing and professional fees to be charged in line with legislation.

		optimum use of patient benefits.	
2	Work according to the approved budget.	Monitor income and expenditure in line with budget prescripts.	Develop and effectively analyse and manage financial data and budgets.
3	Comply with all relevant legislative prescripts.	Monitor adherence to all relevant legislative prescripts.	Ensure adherence to all relevant legislative prescripts.
4	Perform cost-benefit analysis.	Apply the principles of pharmacoeconomic assessments.	Apply the principles of pharmacoeconomic assessments.
Pharmaceutical infrastructure management			
1	Identify pharmaceutical facility and equipment needs.	Identify pharmaceutical facility and equipment needs.	Identify pharmaceutical facility and equipment needs and develop a plan to achieve and meet the needs.
2	Monitor the suitability of pharmaceutical facilities and equipment.	Monitor the suitability of pharmaceutical facilities and equipment.	Manage pharmaceutical facilities and equipment.
3	Work according to the approved workplace procedures and policies.	Implement and monitor workplace procedures and policies.	Develop and review workplace procedures and policies as required.
4	Prioritise and organise the workflow and demonstrate time management skills.	Manage, prioritise and organise the workflow and demonstrate time management skills.	Develop and review workflow systems to manage, prioritise and organise daily work and demonstrate time management skills
5	Maintain the existing pharmaceutical infrastructure.	Contribute to the improvement of the existing pharmaceutical infrastructure.	Ensure pharmaceutical infrastructure is in line with legislative requirements.
6	Work according to the approved document management and recordkeeping systems.	Implement a system for documentation and recordkeeping for quality assurance purposes.	Develop and update systems for documentation and recordkeeping for quality assurance purposes.
Change management			
1	Participate in change management processes within the team.	Manage a change management process for the team.	Contribute to and lead a change management process beyond the team/workplace or across disciplines.
2	Overcome internal barriers and self-limiting beliefs to change by analysing the climate and the readiness for change followed by measures to improve personnel	Motivate staff to overcome barriers to change in order to drive organisational success and outcomes.	Develop strategies to inspire and motivate staff to overcome barriers to change in order to drive organisational success and outcomes.

	growth and contribute to organisational		
Policy development			
1	Apply policies and SOPs.	Implement and monitor policies and SOPs.	Develop a policy framework and SOPs

Section C: Management training needs

We are interested in determining your current management training needs and your areas of development.

For each question, please indicate your need for training in the topics listed on a scale from 1 to 4, where 1 is “Definitely do not need training” and 4 is “Definitely need training”.

	Definitely do not need training	Do not need training	Do need training	Definitely do need training
Human resources management				
Effectively manage pharmacy personnel under personal supervision.	1	2	3	4
Participate in the provision of staff training and continuing professional development.	1	2	3	4
Conduct staff assessments or appraisals in line with the performance management policy.	1	2	3	4
Monitor adherence to relevant human resources management legislation., Labour Relations Act and Basic Conditions of Employment Act.	1	2	3	4
Identify human resource requirements and manage human resources effectively.	1	2	3	4
Identify staff training needs, facilitate appropriate training opportunities and participate in continuing professional development.	1	2	3	4
Review performance management policies and processes.	1	2	3	4
Develop and train pharmacy personnel in basic human resources management legislation, e.g., Labour Relations Act and Basic Conditions of Employment Act.	1	2	3	4
Financial management				
Monitor patient prescription claims submitted to health funders to ensure optimum use of patient benefits.	1	2	3	4
Monitor income and expenditure in line with budget prescripts.	1	2	3	4
Monitor adherence to all relevant legislative prescripts.	1	2	3	4
Apply the principles of pharmacoeconomic assessments.	1	2	3	4

Determine dispensing and professional fees to be charged in line with legislation.	1	2	3	4
Develop and effectively analyse and manage financial data and budgets.	1	2	3	4
Ensure adherence to all relevant legislative prescripts.	1	2	3	4
Apply the principles of pharmacoeconomic assessments.	1	2	3	4
Pharmaceutical infrastructure management				
Identify pharmaceutical facility and equipment needs.	1	2	3	4
Monitor the suitability of pharmaceutical facilities and equipment.	1	2	3	4
Implement and monitor workplace procedures and policies.	1	2	3	4
Manage, prioritise and organise the workflow and demonstrate time management skills.	1	2	3	4
Contribute to the improvement of the existing pharmaceutical infrastructure.	1	2	3	4
Implement a system for documentation and recordkeeping for quality assurance purposes.	1	2	3	4
Identify pharmaceutical facility and equipment needs and develop a plan to achieve and meet the needs.	1	2	3	4
Manage pharmaceutical facilities and equipment.	1	2	3	4
Develop and review workplace procedures and policies as required.	1	2	3	4
Develop and review workflow systems to manage, prioritise and organise daily work and demonstrate time management skills	1	2	3	4
Ensure pharmaceutical infrastructure is in line with legislative requirements.	1	2	3	4
Develop and update systems for documentation and recordkeeping for quality assurance purposes.	1	2	3	4
Change management				
Manage a change management process for the team.	1	2	3	4
Motivate staff to overcome barriers to change in order to drive organisational success and outcomes.	1	2	3	4
Contribute to and lead a change management process beyond the team/workplace or across disciplines.	1	2	3	4
Develop strategies to inspire and motivate staff to overcome barriers to change in order to drive organisational success and outcomes.	1	2	3	4

Policy development				
Implement and monitor policies and SOPs.	1	2	3	4
Develop a policy framework and SOPs	1	2	3	4

Please indicate whether there are management needs that were not covered in the questionnaire and for which you would like to receive training.

--

Annexure 2: Introduction email

Good day, Potential Participant

You receive this email because you were chosen from the South African Pharmacy Council (SAPC) register to take part in a study led by Phillip Boonzaier, an MBA student at North-West University's Business School. The study will focus on **Investigating the management training needs of Responsible Pharmacists under 35 years in South Africa**. You were chosen because you are under 35 years old and currently registered as a Responsible Pharmacist (RP) in the pharmacy profession with SAPC.

My name is Dr Willem Basson, and I will be acting as the gatekeeper in this study to protect your personal information so that Mr Boonzaier cannot directly interact with any participant of the study. I am thus not directly involved in the research project. Apart from this email, you may receive 2 or 3 reminder emails from me.

Participation is entirely voluntary, and you are free to leave at any time.

If you'd like to take part in this research study, please click the link below. You'll be redirected to an information page and an informed consent form. Only after agreeing to voluntarily participate, then will you be redirected to the survey. This survey should only take about 20 minutes to complete.

If you have any questions regarding this research project, you may contact the researcher, Phillip at 082 321 4495 or email him at phillipboonzaier@gmail.com, or the supervision of this study, Dr Mariet Eksteen at 012 470 9560 or mariet@pssa.org.za.

Kind regards

Dr Willem Basson

(LINK WOULD BE HERE)

Annexure 3: Ethical approval



Private Bag X1290, Potchefstroom
South Africa 2520

Tel: 018 299-1111/2222
Fax: 018 299-4910
Web: <http://www.nwu.ac.za>

Senate Committee for Research Ethics
Tel: 018 299-4849
Email: nkosinathi.machine@nwu.ac.za

16 August 2022

ETHICS APPROVAL LETTER OF STUDY

Based on approval by the **Economic and Management Sciences Research Ethics Committee (EMS-REC)** on 29/07/2022, Round Robin the Economic and Management Sciences Research Ethics Committee hereby **approves** your study as indicated below. This implies that the North-West University Senate Committee for Research Ethics (NWU-REC) grants its permission that, provided the special conditions specified below are met and pending any other authorisation that may be necessary, the study may be initiated, using the ethics number below.

Study title: Investigating the management training needs of responsible pharmacists under 35 years in South Africa
Study Leader/Supervisor (Principal Investigator)/Researcher: Dr M Eksteen / Prof T du Plessis - MBA
Student: Boonzaier, P (21603049)

Ethics number:

N	W	U	-	0	0	7	2	9	-	2	2	-	A	4
---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

Institution Study Number Year Status
Status: S = Submission; R = Re-Submission; P = Provisional Authorisation; A = Authorisation

Application Type:

Commencement date: 16/08/2022

Risk: Low

Expiry date: 16/08/2023

Approval of the study is initially provided for a year, after which continuation of the study is dependent on receipt and review of the annual (or as otherwise stipulated) monitoring report and the concomitant issuing of a letter of continuation.

Special in process conditions of the research for approval (if applicable):

•

General conditions:

While this ethics approval is subject to all declarations, undertakings and agreements incorporated and signed in the application form, the following general terms and conditions will apply:

- The study leader/supervisor (principle investigator)/researcher must report in the prescribed format to the EMS-REC:
 - annually (or as otherwise requested) on the monitoring of the study, whereby a letter of continuation will be provided, and upon completion of the study; and
 - without any delay in case of any adverse event or incident (or any matter that interrupts sound ethical principles) during the course of the study.
- The approval applies strictly to the proposal as stipulated in the application form. Should any amendments to the proposal be deemed necessary during the course of the study, the study leader/researcher must apply for approval of these amendments at the EMS-REC, prior to implementation. Should there be any deviations from the study proposal without the necessary approval of such amendments, the ethics approval is immediately and automatically forfeited.
- Annually a number of studies may be randomly selected for an external audit.
- The date of approval indicates the first date that the study may be started.

- n the interest of ethical responsibility, the NWU-SCRE and EMS-REC reserves the right to:*
- request access to any information or data at any time during the course or after completion of the study;*
 - to ask further questions, seek additional information, require further modification or monitor the conduct of your research or the informed consent process;*
 - withdraw or postpone approval if:*
 - any unethical principles or practices of the study are revealed or suspected;*
 - it becomes apparent that any relevant information was withheld from the EMS-REC or that information has been false or misrepresented;*
 - submission of the annual (or otherwise stipulated) monitoring report, the required amendments, or reporting of adverse events or incidents was not done in a timely manner and accurately; and / or*
 - new institutional rules, national legislation or international conventions deem it necessary.*
- Please note that the ethics approval of this application is subject to the Covid-19 protocols.

The EMS-REC would like to remain at your service as scientist and researcher, and wishes you well with your study. Please do not hesitate to contact the EMS-REC or the NWU-SCRE for any further enquiries or requests for assistance.

Yours sincerely,

Mark
Rathbone

Digitally signed by Mark Rathbone
DN: cn=Mark Rathbone, o=North-
West University, ou=Business
management,
email=mark.rathbone@nwu.ac.za,
c=ZA
Date: 2022.08.17 12:52:41 +02'00'

Prof Mark Rathbone
Chairperson: NWU Economic and Management Sciences Research Ethics Committee

Annexure 4: Information leaflet



Ethics clearance reference number: N W U - 0 0 7 2 9 - 2 2 - A 4

We want to *Investigating the management training needs of Responsible Pharmacists under 35 years in South Africa*. There is a total of **62 questions**, and it will take approximately **20 minutes** of your time to complete.

Inclusion criteria for participation:

- You must be a registered Responsible Pharmacists under 35 years in South Africa.
- Your only responsibility as a *willing* participant will be to complete this survey as honestly as is possible.

Important notices, terms and conditions:

- The study is part of an MBA qualification and is conducted by NWU Business School.
- No personal questions or identifying particulars will be asked.
- This survey is voluntary, and you are under no obligation to complete it.
- There will be no negative consequences to you if you do not complete the survey.
- Results will only be used and presented in an anonymised format from the total sample. Therefore, your individual results will not be presented or released at any time.
- By completing this survey, you agree that the information you provide can be used for research purposes. Specifically for potential academic publications and conferences.
- There are no correct or incorrect answers to any of the questions in this survey.
- This study has been approved by the NWU Business School Research Ethics Committee (EMS-REC) with Ethics number NWU-00729-22-S4 Electronic datasets will be completely anonymised and stored for a period of seven years on a password-protected computer.
- POPI Act requirements will be followed regarding all data collected.

If you have **ANY** questions or concerns, you are welcome to contact the researchers:

	Researcher: Mr Phillip Boonzaier MBA Student NWU Business School Phillipboonzaier@gmail.com	Research supervisor: Dr Mariet Eksteen Mariet@pssa.org.za Research Co-supervisor: Prof Tommy Du Plessis Tommy.Duplessis@nwu.ac.za
---	--	--

IF YOU DO NOT WISH TO PARTICIPATE NO FURTHER ACTION IS REQUIRED

Annexure 5: SAPJ author guidelines

Submission Preparation Checklist

As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

✓	The submission has not been previously published, nor is it before another journal for consideration (or an explanation has been provided in Comments to the Editor).
✓	The submission file is in Microsoft Word file format.
✓	Where available, URLs for the references have been provided.
✓	The text is 1,5-spaced; uses a 12-point Times New Roma font; employs italics, rather than underlining (except with URL addresses); and all illustrations, figures, and tables are placed within the text at the appropriate points, rather than at the end.
✓	The text adheres to the stylistic and bibliographic requirements outlined in the Author Guidelines.

Author Guidelines

Submitted manuscripts that are not in the correct format and without the required supporting documentation specified in these guidelines will be returned to the author(s) for correction and will delay publication.

AUTHORSHIP

Named authors must consent to publication **by signing a covering letter** which should be submitted as a supplementary file. Authorship should be based on substantial contribution to:

- (i) conception, design, analysis and interpretation of data;
- (ii) drafting or critical revision for important intellectual content; and
- (iii) approval of the version to be published. These conditions must all be met (uniform requirements for manuscripts submitted to biomedical journals; refer to www.icmje.org); and
- (iv) exact contribution of each author must be stated and
- (v) a motivation as to why the article should be published in the SAPJ.

DECLARATION OF CONFLICT OF INTEREST

Authors must declare all sources of support for the research and any association with a product or subject that may constitute a conflict of interest. If there is no conflict of interest to declare please include the following: The authors declare no conflict of interest.

FUNDING SOURCE

All sources of funding should be declared. Also define the involvement of study sponsors in the study design, collection, analysis and interpretation of data; the writing of the manuscript; the decision to submit the manuscript for publication. If the study sponsors had no such involvement, this should be stated as follows: No funding source to be declared.

RESEARCH ETHICS COMMITTEE APPROVAL

The submitting author must provide written confirmation of Research Ethics Committee approval for all studies including case reports. The ethics committee as well as the approval number should be included.

STATISTICAL ANALYSIS

Authors are advised to involve medical statisticians at the protocol stage of their research project: to plan sample size, and the selection of appropriate statistical tests for analysis and presentation.

PROTECTION OF PATIENT'S RIGHTS TO PRIVACY

Identifying information should not be published in written descriptions, photographs, and pedigrees unless the information is essential for scientific purposes and the patient (or parent or guardian) gives informed written consent for publication. The patient should be shown the manuscript to be published. Refer to www.icmje.org.

Editorials

Opinions, etc. should not exceed 1 000 words and are welcome, but unless invited, will be subjected to the SAPJ peer review process.

Review articles

Review articles relevant to pharmaceutical sciences should not exceed 5 000 words, with a maximum of 50 references and no more than 6 tables or figures. A summary of 250 words or less is required.

Letters to the editor

Letters to the editor should be 400 words or less with only one image or table.

Obituaries

Obituaries should be 900 words or less and should be accompanied by a photograph.

MANUSCRIPT PREPARATION

Refer to articles in recent issues for the presentation of headings and subheadings. If in doubt, refer to 'uniform requirements' - www.icmje.org. Manuscripts must be provided in **UK English**.

Qualification, affiliation and contact details

This information must be provided for ALL authors and must be submitted as a supplementary file.

Email addresses of all author must be provided.

ORCID number of ALL authors must be provided – if authors do not have ORCID, please register at <https://orcid.org>

Abbreviations

All abbreviations should be spelt out when first used and thereafter used consistently, e.g. 'intravenous (IV)' or 'Department of Health (DoH)'.

Scientific measurements

Scientific measurements must be expressed in SI units except blood pressure (mmHg) and haemoglobin (g/dl). Lit denoted with a lowercase 'l' e.g. 'ml' for millilitres). Units should be preceded by a space (except for %), e.g. '40 kg' cm' but '50%'. Greater/smaller than signs (> and 40 years of age) should also be preceded by a space e.g. > 20 year spaces should precede ± and °, i.e. '35±6' and '19°C'.

Numbers should be written as grouped per thousand-units, i.e. 4 000, 22 160...

Quotes should be placed in single quotation marks: i.e. The respondent stated: '...' Round **brackets** (parentheses) be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct qu

Qualification, affiliation and contact details

This information must be provided for ALL authors and must be submitted as a supplementary file.

Email addresses of all author must be provided.

ORCID number of ALL authors must be provided – if authors do not have ORCID, please register at <https://orcid.org/>

Abbreviations

All abbreviations should be spelt out when first used and thereafter used consistently, e.g. 'intravenous (IV)' or 'Department of Health (DoH)'.

Scientific measurements

Scientific measurements must be expressed in SI units except blood pressure (mmHg) and haemoglobin (g/dl). Litres is denoted with a lowercase 'l' e.g. 'ml' for millilitres). Units should be preceded by a space (except for %), e.g. '40 kg' and '20 cm' but '50%'. Greater/smaller than signs (> and 40 years of age) should also be preceded by a space e.g. > 20 years. No spaces should precede ± and °, i.e. '35±6' and '19°C'.

Numbers should be written as grouped per thousand-units, i.e. 4 000, 22 160...

Quotes should be placed in single quotation marks: i.e. The respondent stated: '...' Round **brackets** (parentheses) should be used, as opposed to square brackets, which are reserved for denoting concentrations or insertions in direct quotes.

General formatting

The manuscript must be in Microsoft Word or RTF document format. Text must be 1,5-spaced, in 12-point Times New Roman font, and contain no unnecessary formatting (such as text in boxes, except for Tables). *The manuscript must be free of track changes.*

ILLUSTRATIONS AND TABLES

If tables or illustrations submitted have been published elsewhere, the author(s) should provide consent to republication obtained from the copyright holder.

Tables may be embedded in the manuscript file **and** provided as '**supplementary files**'. They must be numbered in Arabic numerals (1,2,3...) and referred to consecutively in the text (e.g. 'Table 1'). Tables should be constructed carefully and simply for intelligible data representation. Unnecessarily complicated tables are strongly discouraged. Tables must be cell-based (i.e. not constructed with text boxes, tabs or enters) and accompanied by a concise title and column headings. Footnotes must be indicated with consecutive use of the following symbols: * † ‡ § ¶ || then ** †† ‡‡ etc.

Figures must be numbered in Arabic numerals and referred to in the text e.g. '(Figure 1)'. Figure legends: Figure 1: 'Title...'. All illustrations/figures/graphs must be of **high resolution/quality**: 300 dpi or more is preferable, but images must not be resized to increase resolution. Unformatted and uncompressed images must be attached as '**supplementary files**' upon submission (not embedded in the accompanying manuscript). TIFF and PNG formats are preferable; JPEG and PDF formats are accepted, but authors must be wary of image compression. Illustrations and graphs prepared in Microsoft PowerPoint or Excel must be accompanied by the original workbook.

REFERENCES

Authors must verify references from the original sources. *Only complete, correctly formatted reference lists will be accepted.* Reference lists may be generated with the use of reference manager software, but the final document must be delinked from the reference database or otherwise generated manually. Citations should be inserted in the text as superscript, e.g. These regulations are endorsed by the World Health Organization,² and others.^{3,4-6} The superscript reference number should come after the punctuation mark.

All references should be listed at the end of the article in numerical order of appearance in the **Vancouver style** (not alphabetical order). Approved abbreviations of journal titles must be used; see the List of Journals in Index Medicus. Names and initials of all authors should be given; if there are more than six authors, the first three names should be given followed by et al. First and last page, volume and issue numbers should be given. **Wherever possible, references must be accompanied by a digital object identifier (DOI) link and PubMed ID (PMID)/PubMed Central ID (PMCID).** Authors are encouraged to use the DOI lookup service offered by [CrossRef](#). Crossref DOIs should always be displayed as a full URL link in the form <https://doi.org/10.xxxx/xxxx>

Journal references: Price NC, Jacobs NN, Roberts DA, et al. Importance of asking about glaucoma. Stat Med 1998;289(1):350-355. [<http://dx.doi.org/10.1000/hgjr.182>] [PMID: 2764753]

Book references: Jeffcoate N. Principles of Gynaecology. 4th ed. London: Butterworth, 1975:96-101. *Chapter/section in a book:* Weinstein L, Swartz MN. Pathogenic Properties of Invading Microorganisms. In: Sodeman WA jun, Sodeman WA, eds. Pathologic Physiology: Mechanisms of Disease. Philadelphia: WB Saunders, 1974:457-472.

Internet references: World Health Organization. The World Health Report 2002 - Reducing Risks, Promoting Healthy Life. Geneva: World Health Organization, 2002. <http://www.who.int/whr/2002> (accessed 16 January 2010).

COVERING LETTER

A covering letter to the editor is mandatory and must include statements that the manuscript has not been published previously and is not under review elsewhere. It should state details of any prior publication of the research in abstract form or in Congress proceedings. The letter must declare if any of the authors have a conflict of interest and that the requirements for submission, including ethics approval and patient permission for case reports have been fulfilled.

A motivation as to why the article should be published in the SAPJ should also be included.

All authors must sign the covering letter.

Please provide the names and email addresses of three possible reviewers for this manuscript.

REVIEW PROCESS

Manuscripts, after vetting by the editorial team, are assigned for peer-review to 3 reviewers, conversant with the particular field of research. The reviewers and the authors are blinded to each other's identity. The turn-around time for review and initial editorial decision notification aims to be within 6 weeks of submission.

PROOFS

A PDF proof of an article may be sent to the corresponding author before publication to resolve remaining queries. At that stage, **only** typographical changes are permitted; the corresponding author is required, having conferred with his/her co-authors, to reply within 2 working days in order for the article to be published in the issue for which it has been scheduled.

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Please notify the editorial department of any contact detail changes, including email, to facilitate communication.

CHARGES

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Annexure 6: SAPJ accepted for publication confirmation.



Phillip Boonzaier <phillipboonzaier@gmail.com>

[SAPJ] 3217 Editor Decision

Robyn Marais <robyn@jesser-point.co.za>

Mon, Oct 9, 2023 at 8:20 AM

To: Phillip Boonzaier <Phillipboonzaier@gmail.com>, "Mariet J Eksteen, Dr" <mariet@pssa.org.za>, "Tommy Du Plessis, Prof" <tommy.DuPlessis@nwu.ac.za>

Phillip Boonzaier, Mariet J Eksteen, Dr, Tommy Du Plessis, Prof:

Thank you for your revised manuscript entitled "Gender Perspectives on the Current application of Young Responsible Pharmacist Management Competencies" which has been accepted for publication. You will be contacted by our proofreader, in due course, to finalise the editing of the manuscript.

Thank you for supporting the South African Pharmaceutical Journal.

Yours sincerely
Prof N Schellack
Editor: SA Pharmaceutical Journal

Email: robyn@jesser-point.co.za

South African Pharmaceutical Journal

Annexure 7: PEJ author guidelines



Home / Submissions

Submissions

Login or Register to make a submission.

Submission Preparation Checklist

As part of the submission process, authors are required to check off their submission's compliance with all of the following items, and submissions may be returned to authors that do not adhere to these guidelines.

- ✓ The submission file is in Microsoft Word format.

The authors should have the following files ready to be submitted as separate files:

1. File 1 - Title page
- ✓ 2. File 2 - Manuscript
3. File 3 - The methodological checklist
4. File 4 - Appendices (if available)

File 1. Title page (see 5.1) is submitted as a separate file with complete information according to guideline.

- Full article title that should include MeSH terms
- Abbreviated title (up to 50 characters).
- Each author's complete name and institutional affiliation(s).
- ✓ - Corresponding author (name, full postal address, phone/fax, e-mail).
- ORCID IDs of all authors.
- Grants and/or funding information.
- Acknowledgement.
- Conflict of interest statement.
- Ethics Approval and Informed Consent.

File 2. Manuscript should have the following features:

- Abstract and keywords, which should include MeSH terms.
- Double-spaced text.
- 12-point Calibri font.
- Margins of 2.5 cm.
- ✓ - All pages are numbered subsequently, with no embedded footers/headers.
- References mentioned in the Reference List are cited in the text and vice versa.
- References are based on the APA referencing style.
- DOI (or URL) has been provided in the reference list, when available.
- All figures and tables (with relevant captions) are inserted after the references.
- All figures and tables should use 10-point Calibri font.

File 3. The methodological checklist

- ✓ A filled-out methodological checklist related to the type of manuscript (see section 4. Methodological checklist of manuscript categories).

File 4. Appendices (if available) should:

- ✓ - Be lettered (e.g., Appendix A).

- Include a descriptive title for each.
- Be referred to in the main text.

✓ The Authors have obtained all necessary permissions to include in the paper items such as: quotations, figures, tables, results of government-sponsored research, etc.

Author Guidelines

1. Scope and review process

Pharmacy Education provides a forum for the communication of relevant information for pharmacy educators and all others interested in the advancement of the wider scope of pharmacy education. To be considered for publication, manuscripts must align with the [Focus and Scope](#) of the journal.

To ensure that only accurate and substantive articles are included, all manuscripts undergo a [Peer Review process](#) and editorial approval prior to acceptance. Submission of a paper to *Pharmacy Education* will be taken to imply that it represents original work not previously published, that it is not being considered elsewhere for publication, and that, if accepted for publication, it will not be published elsewhere in the same form, in any language, without the consent of the editors and publisher. It will also be assumed that the author has obtained all necessary permissions to include in the paper such items as quotations, figures, tables, results of government-sponsored research, etc.

2. Publication ethics

The *journal* takes publishing ethical concerns extremely seriously and follows the guidelines and best practice recommendations of [the Committee on Publication Ethics \(COPE\)](#). Hence, every manuscript is screened for plagiarism using specialised software.

Therefore, authors are required to follow ethical guidelines on authorship attribution, conflicts of interest, adherence to moral principles when using experimental animals and human subjects, financial support disclosures, and involvement in the peer review procedure.

Plagiarism, duplicate submissions, excessive and irrelevant self-citations, and instances of inaccurate or fraudulent data will also be grounds for rejection.

In addition to refraining from coercive citations, editors and reviewers are expected to uphold ethical norms related to conflicts of interest, the confidentiality of the reviewed papers, objective assessment of the work, and the maintenance of reviewers' anonymity until approval. Editors are responsible for accepting or rejecting papers.

Plagiarism. Authors are responsible for accurately citing and acknowledging all ideas of others (published or unpublished material, whether in handwritten, printed, or electronic form) presented in their paper. Manuscripts shown with plagiarism or duplication will not be considered for publication in the *journal*.

Duplicate submissions. *Pharmacy Education* will only consider manuscripts not previously published or under consideration for publication elsewhere, either in whole or in part.

Ethical citation and academic integrity. The authors should adopt relevant citations to support their writing. Citing own work is sometimes necessary to avoid self-plagiarism or reflect the continuum of a long-term project. However, excessive self-citation aiming to raise the scores of authors by promoting their work lies under data manipulation and undermines academic integrity. Excessive self-

citation consists of using biased references (geographical, school-of-thought, agreement for mutual citation between a group of authors) that do not represent the state of knowledge in the field at the time of writing.

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Coercive citation. This practice occurs when an editor or reviewer forces an author to add citations irrelevant to an article before it is accepted for publication, with the purpose of raising their score or that of the journal. Authors are encouraged to report such practices to the Journal Editor.

3. Authorship, contributions, and ethics

Authors seeking publication take responsibility and accountability for their work and listed authors should therefore fulfil ALL of the following four criteria:

1. Substantially contributed to the conception/design of the work, or the acquisition, analysis, or interpretation of data gathered;
2. Drafted the work or revised it critically for important intellectual content;
3. Given final approval of the version to be published;
4. Agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

It is the collective responsibility of the authors to ensure that all named authors meet all four criteria. Those who do not meet all four criteria should be acknowledged as 'Contributors'. In cases where conflict arises with regard to who should qualify for authorship, the institution(s) where the work was performed should be asked to investigate.

Corresponding Author (CA): The CA takes on the responsibility of primary contact for communication with the Journal during the Submission Process, including the Peer Review and the publication process. The CA should be available to respond to editorial queries in a timely way and should be available after publication to respond to critiques of the work and to cooperate with any requests from the Journal about the paper. The Journal Editors will liaise primarily with the CA but will send copies of all correspondence to all listed authors.

Contributors: Authors who meet less than the required four criteria above for authorship can be acknowledged as 'Contributors'. Authors are encouraged to specify the contributions made by named Contributors.

Removal/Addition of Author: If authors request the removal or addition of an author after manuscript submission or publication, an explanation and signed statement from all listed authors should be forwarded to the Journal Editors. An explanation and signed statement from the author to be removed or added are also requested.

Ethics Approval and Informed Consent. The authors should ensure that research involving human subjects has been carried out in accordance with The Declaration of Helsinki and approved by the appropriate research or ethics review committee, or that it has been determined to be exempt from such review.

4. Methodological checklists of manuscript categories

All manuscripts should follow methodological checklists according to their type:

- Observational studies: The STROBE checklist.
- Qualitative studies: The NICE Methodology checklist.

- Case-control and cohort studies: The Newcastle-Ottawa Quality Assessment Scale.
- Experimental studies: CONSORT Transparent Reporting of Trials.
- Scale Development and Validation: Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer.
- Systematic reviews and meta-analyses: The PRISMA checklist
- Clinical practice guidelines: The AGREE reporting checklist
- Case Report: The CARE Statement Checklist
- Economic evaluations of health interventions: The CHEERS checklist.
- Clinical trial protocol: The SPIRIT checklist.
- Diagnostic Accuracy Studies: The STARD guidelines checklist.

5. Manuscript organisation

All papers must be submitted in UK/British English and should be formatted double-spaced, with margins of 2.5 cm. The text must be in 12-point Calibri font. The submission file should be in Microsoft Word format.

Manuscripts should be divided into Title page, Abstract and Keywords, Introduction, Methods, Results, Discussion, References, Figures, and Tables.

All pages should be numbered sequentially within the manuscript.

All manuscripts are blinded and should include the following (in this order): (1) Title page, (2) Abstract and Keywords, (3) Main Body (with all author names and identifying information removed for peer review), (4) References, (5) Figures and Tables, and (6) Appendices (if available).

The title page and appendices must be submitted as separate files.

5.1. Title page

The title page must be submitted as a separate file and should include the following:

- Type of manuscript (Research Article, Programme Description, etc.)
- Full article title that should include MeSH terms
- Abbreviated title (up to 50 characters)
- Each author's complete name and institutional affiliation(s).
- Corresponding author (name, full postal address, phone/fax, e-mail).
- ORCID IDs of all authors.
- Grants and/or funding information. Authors should disclose any funds or grants received.
- Acknowledgement
- Conflict of interest statement. If there are no conflicts of interest, the authors should state that there are none.
- Ethics Approval and Informed Consent (should be also included in the Methods section). A statement of ethics approval is required and should include the name of the ethics committee(s) or institutional review board(s), the number/ID of the approval(s), and a statement that participants gave informed consent before taking part.

5.2. Abstract and keywords

Abstracts should be structured (Introduction, Methods, Results, Conclusion), 150-200 words for full-length articles, and include MeSH terms. For short reports and narrative reviews, abstracts should not exceed 150 words and can be narrative (unstructured).

Three to six keywords separated by commas should be listed alphabetically below the abstract.

5.3. Text

The text should be written in the third person and be scholarly, readable, clear, and concise. Standard nomenclature should be used. Unfamiliar terms and acronyms should be defined in the first instance. Manuscripts that were prepared for oral presentation must be rewritten for print. Excessively long introductions or discussion sections should be avoided in research papers. All manuscripts should be structured according to their type (see 5)

Abbreviations. Abbreviations should be defined when they first occur in the abstract, the text, and table and figure legends. Once an abbreviation has been introduced in the main body of the text, it should be used throughout.

Text Headings: Headings should be set over to the left-hand margin and the text should begin on the next line.

Footnotes should be indicated in the text by the following symbols: * (asterisk or star), † (dagger), ‡ (double dagger), ¶ (paragraph mark), § (section mark), || (parallels), # (number sign). Numerals should not be used for footnote call-outs as they may be mistaken for bibliographic reference call-outs or exponents. Each footnote should be typed at the bottom of the typescript page on which its text call-out appears. Footnotes within a table should be indicated by the same symbols listed above. Reinitialise symbol sequence within tables. Footnotes to a table should be typed directly beneath the table.

5.4. References

Only papers that have been published or are in press may be cited; abstracts, unpublished data, and personal communications should not be included in the reference list but may be included in the text.

Authors are responsible for obtaining permission to quote personal communications and unpublished data from the cited author.

Reference style should conform to the guidelines of the American Psychological Association (APA) Manual, seventh edition.

References should be limited to publications within the last 5 years, whenever possible.

In-Text Citations. Citations in the text should be written as follows:

- One author: the author's name (without initials, unless there is ambiguity) and the year of publication (Spencer, 2021);
- Two authors: both authors' names and the year of publication (Spencer & Jordan, 2021);
- More than two authors: first author's name followed by 'et al.' in italics and the year of publication (Spencer *et al.*, 2022).

References should be arranged alphabetically and then sorted chronologically. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', 'c', etc., placed after the year of publication in the in-text citation: (Spencer *et al.*, 2021a) and (Spencer *et al.*, 2021b).

References should include a DOI in the hyperlink format, when available: <https://doi.org/10.1080/14622299050011431>, not DOI: 10.1080/14622299050011431

Bibliography. References should be alphabetised at the end of the manuscript text in the following formats:

- **Book:** Sapolsky, R. M. (2017). *Behave: The biology of humans at our best and worst*. Penguin Books.
- **Book chapter:** Dillard, J. P. (2020). Currents in the study of persuasion. In M. B. Oliver, A. A. Raney, & J. Bryant (Eds.), *Media effects: Advances in theory and research* (4th ed., pp. 115–129). Routledge.
- **Journal article:** Grady, J. S., Her, M., Moreno, G., Perez, C., & Yelinek, J. (2019). Emotions in storybooks: A comparison of storybooks that represent ethnic and racial groups in the United States. *Psychology of Popular Media Culture*, 8(3), 207–217. <https://doi.org/10.1037/ppm0000185>
- **Website/online published source:** Peirce College. (2019). Who are adult learners (online). Available at: <https://www.peirce.edu/degrees-programs/additional-resources/adult-learners/who-are-adult-learners>
- **Report from a global or national organisation:** International Pharmaceutical Federation (FIP). (2021). *FIP digital health in*

5.5. Figures and Tables

Figures and Tables (up to 8 in total) should not be inserted into the text but provided on separate pages within the file.

Figures: All figures and charts should be numbered with consecutive Arabic numbers (e.g., Figure 1), have descriptive captions, be mentioned in the text, and be of publishable quality. An approximate position for insertion should be indicated. All figures should have a caption to make interpretation possible without reference to the text. Captions should include keys to symbols. All figures should be in black/white/greyscale unless an essential colour is required.

Tables: Tables should be consecutively numbered with Roman numerals (e.g., Table I, Table II, etc.). An approximate position for insertion should be indicated. Each table should have a caption describing its contents. Footnotes to tables should be typed beneath them. Use symbols to refer to them.

5.6. Appendices

Appendices should be lettered to distinguish them from numbered tables and figures and should include a descriptive title for each (e.g., "Appendix A: Sharks' representative questions to student presenters"). Appendices should be referred to in the main text.

6. Managing proofs

Once a manuscript has been approved for publication, a galley proof is prepared for authors to check. The galley will include proofs of illustrations, tables, figures, and appendices. Authors are given this opportunity to check for minor essential corrections and edits and not for general revision or alteration.

Research Article

Research Article should be related to any field of pharmacy education and training.

Research articles include experimental studies, observational investigations, systematic reviews, and meta-analyses that used formal methods for data collection and reporting of results (maximum 4500 words, excluding abstract, references, and figures and tables) and should include the following headings: Introduction, Methods, Results, Discussion, and Conclusion.

Programme Description

Programme Descriptions of courses, modules, or programmes and software development, including information technology innovations impacting pharmacy education. All submissions should have clear evidence of novelty and provide robust evaluation and evidence-led development. Please format with the following sections: Introduction or Context, Description of course/module/programme/innovation, Evaluation and/or novelty that is evidence-driven, and plans/work/implementation (maximum 4500 words, excluding abstract, references, and figures and tables).

Review

Narrative Reviews are comprehensive, significantly referenced descriptive papers on teaching or research topics directly related to education and training, skills development or workforce development (maximum 4500 words, excluding abstract, references, and figures and tables).

Short Report

Short Reports of work in progress or pilot schemes (maximum 1000 words).

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For published papers, *Pharmacy Education* will keep copies of the original submission, reviews and revisions, and all email correspondence to help answer future questions or queries about the published work.

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Annexure 8: PEJ submission acknowledgement



Phillip Boonzaier <phillipboonzaier@gmail.com>

[PE] Submission Acknowledgement to Pharmacy Education

3 messages

Dr Marwan El Akel (Editor) via Pharmacy Education <noreply@pharmacyeducation.fip.org>

Mon, Nov 20, 2023 at

7:13 PM

Reply-To: "Dr Marwan El Akel (Editor)" <pej@fip.org>

To: Phillip Boonzaier <phillipboonzaier@gmail.com>

Dear Phillip Boonzaier,

Thank you for submitting the manuscript, "Current management needs for early career Responsible pharmacists in South Africa" to Pharmacy Education. With the online journal management system that we are using, you will be able to track its progress through the editorial process by logging in to the journal web site:

Manuscript URL: <https://pharmacyeducation.fip.org/pharmacyeducation/authorDashboard/submission/2550>

Username: pboonzaier

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All submissions to Pharmacy Education are peer reviewed by 2 reviewers, and relayed to you by a nominated Section Editor from our Editorial Team. The Section Editor may ask you to make revisions to the paper to render it acceptable for publication and ask that you make revisions within one month of receipt. We shall then review your revised paper and advise you of our decision, which is final.

If you have any questions, please do not hesitate to contact me. Thank you for considering this journal as a venue for your work.

Kind regards

Dr Marwan Akel

Editor

pej@fip.org

Pharmacy Education

Pharmacy Education

Annexure 9: Proof of language editing

To whom it may concern

Cecile van Zyl
Language editing and translation
Cell: 072 389 3450
Email: Cecile.vanZyl@nwu.ac.za

20 November 2023

Dear Mr / Ms

Re: Language editing of sections of a mini-dissertation (Investigating the management training needs of responsible pharmacists under 35 years in South Africa)

I hereby declare that I language edited the Abstract, as well as Chapters 1, 2 and 4 of the above-mentioned mini-dissertation by P Boonzaier (student number: 21603049).

Please feel free to contact me should you have any enquiries.

Kind regards

A handwritten signature in black ink, appearing to be 'Cecile van Zyl', with a large loop at the end.

Annexure 10: NWU similarity report declaration



Faculty of Economic and Management Sciences

DECLARATION WITH REGARDS TO SIMILARITY REPORT

Turnitin (TII) is the plagiarism- prevention service of choice for the North-West University. A thesis/dissertation/mini-dissertation/article is submitted to the TII website, to be checked for similarities in the document by comparing submitted papers to several databases/repositories on the World Wide Web. It is important to note that TII does NOT identify plagiarism – only similarities. The aim is to draw students' attention to these similarities so that they improve their academic writing style and reporting of sources before submission for examination.

The undersigned declares that the thesis/dissertation/mini-dissertation/article with the title mentioned below, was submitted, assessed and that the issues (if any) have been addressed, and that a satisfactory report has been obtained.

Investigating the management training needs of responsible pharmacists under 35 years in South Africa

Title of dissertation/mini-dissertation\thesis

P Boonzaier

Student (Initials and surname)

MJ Eksteen

Supervisor/Promoter (Initials and surname)

21603049 / Master of Business Administration

Student number and degree

Declaration with regards to similarity report

File reference: 7.1.11.3.5