CLINICAL PHARMACY PRACTICE IN PRIVATE HOSPITALS IN WINDHOEK NAMIBIA

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS

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ABSTRACT

The practice of clinical pharmacy in Namibia is poorly understood, with limited documented evidence of its application in clinical settings. There is broad awareness of the need for the implementation of clinical pharmacy services among healthcare professionals; however, there is a need to further examine the acceptance and integration of clinical pharmacy practice among these professionals. This study assessed the current practice of clinical pharmacy in private hospitals in Windhoek, Namibia, specifically focusing on the level of integration of clinical pharmacy practice into the multi-disciplinary healthcare team and differences in perceptions between healthcare team members. A self-administered questionnaire was distributed online to healthcare professionals (medical practitioners, pharmacists, and nurses) working in private hospitals in Windhoek. Data were analysed using descriptive statistics. A total of 53 healthcare professionals responded to the questionnaire, of which 60% (n=32) were nurses, 20% (n=11) were doctors (general practitioners (n=4) and specialists (n=7)), and 19% (n=10) were pharmacists. The majority (66%, n=35) of the responses confirmed that clinical pharmacists are an integral part of the multi-disciplinary team. Additionally, 43% (n=23) of participants indicated that pharmacists are actively engaged in most areas of care relating to the distribution of pharmaceuticals in their respective hospitals, while a minority (9%, n=5) indicated that pharmacists are not involved in these roles. The study further found that most participants (47%, n=25) indicated that pharmacists are only involved in a few patient care rounds, which reflects that pharmacists in private hospitals in Windhoek still have a lot to do in order to be more involved in clinical practice. Overall, healthcare practitioners in private hospitals in Windhoek are aware of clinical pharmacy practice and view the practice as an integral part of multi-disciplinary care. However, the implementation and provision of clinical pharmacy services are still in their infancy, presenting an opportunity for growth.

Keywords: Clinical pharmacy, Paractice, Health Care Proffessional, Private Hospitals

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LIST OF ABBREVIATIONS AND/OR ACRONYMS

ADE	Adverse Drug Event
ADR	Adverse Drug Reaction
EHR	Electronic Health Record
FIP	International Pharmaceutical Federation
GPs	General Practitioner
HCPs	Healthcare Professionals
HICs	High Income Countries
IQR	Interquartile range
LMIC’s	Low and Middle Income Countries

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DEDICATIONS

"Not that we are competent in ourselves to claim anything for ourselves, but our competence comes from God" **2 Corinthians 3:5**

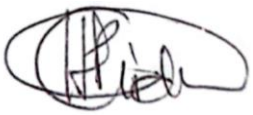
Above all else I dedicate this thesis to God who enables all things,

Prof Frednard Gideon, Jonas Gideon, Titus Gideon and Hendrina Gideon,

And all wonderful people in my life who make it a blessing.

DECLARATIONS

I, **Hendrina Gideon**, hereby declare that this study is my own work and is a true reflection of my research, and that this work, or any part thereof has not been submitted for a degree at any other institution.



Hendrina P Gideon		April 2025
Name of Student	Signature	Date

1 INTRODUCTION

1.1 Background of the study

The launch of the first and only school of pharmacy in Namibia has driven interest in clinical pharmacy, although its implementation in practice has been slow to develop. The term "clinical pharmacy" is defined as "a health science discipline in which pharmacists provide patient care that optimises medication therapy and promotes health, wellness, and disease prevention."[1] The practice of clinical pharmacy embraces the philosophy of pharmaceutical care; it combines a caring orientation with specialised therapeutic knowledge, experience, and judgement to ensure optimal patient outcomes.[1] Hence, a clinical pharmacist, as part of the healthcare team, offers invaluable contributions to the management of patients' medication-related outcomes and overall health.

In 2008, the Hospital Pharmacy Section of the International Pharmaceutical Federation (FIP) met in Basel, Switzerland, to envision the future of hospital pharmacy practice.[2,3] The resulting statements, called the Basel Statements, highlight the goal of hospital pharmacists in optimising patient outcomes through collaborative, inter-professional, and responsible use of medicines and medical devices.[2] These statements were revisited and revised in September 2015 to include new aspirational goals for hospital pharmacy, make the statements easier to understand, and incorporate new hospital pharmacy practices that were not included in the 2008 version.[4]

Namibia, via the University of Namibia, has initiated the first and only locally oriented Master's degree in clinical pharmacy at the School of Pharmacy to build capacity in the field.[5] By training clinical pharmacists in Namibia, the programme ensures contextually driven experiences to prepare pharmacists who can fulfil the role of clinical pharmacists in various institutions locally. In addition, the programme is internationally benchmarked to ensure that training will be relevant to pharmacists in other international settings.[5]

A study by Touchette et al.[6] provides insight into the clinical pharmacist's role in the identification of medication errors that are intervened upon before reaching the patient, providing an opportunity for pharmacists to prevent harm to patients. Namibia's health system, like many countries, includes both public and private health facilities, and the provision of pharmacy services may vary depending on the cases offered and the location of health facilities. The majority of the population (80%) receives their health services from the public sector, with the remaining 20% receiving services from private facilities.[7] Although there are a handful of private hospitals across the country, only six are considered referral hospitals, of which the majority (n=4) are located in Windhoek, the capital and largest city. In Namibia, the ratio of pharmacists to population is approximately 1:4000.[7] In total, there are 661 registered pharmacists, 261 community pharmacies, 46 wholesalers/distributors, five pharmaceutical manufacturers, and about eleven hospital pharmacies.[8]There are currently three cadres of pharmacy personnel in Namibia: pharmacists (Bachelor of Pharmacy degree), pharmacy technicians (Diploma in Pharmacy), and pharmacy assistants (Certificate in Pharmacy).[8]

A prior assessment of hospital pharmacy practice across Namibia (in both public and private settings) found limited clinical pharmacist intervention in both public and private hospitals.[3] This research was designed to investigate the current clinical pharmacy practice in private hospitals in Windhoek from the perspective of several healthcare professional cadres and further provides strategies to be employed in the implementation of clinical practice in hospitals.

1.2 Statement of the problem

In Southern Africa, the concept of clinical pharmacy was developed in the 1980s but remained limited until the late 1980s.[9]Although some Southern African countries, such as South Africa, have made progress in introducing clinical pharmacy practice both in training and

implementation, challenges in implementation persist regionally, primarily driven by a lack of clinically trained pharmacists to carry out these roles.[5,7,10]

In Namibia, a growing cadre of clinical pharmacists is being trained, but the question of their roles across the country remains undefined. While the majority of patients in Namibia receive health services in the public sector, a sizeable minority (18%) receive care in private hospitals, particularly in Windhoek.[7,10] The implementation of clinical pharmacy services relies not only on pharmacists but also on the perspectives and buy-in of other healthcare professionals, as it requires participation in the multidisciplinary care team.

This study is based on the assumption that, firstly, the practice of clinical pharmacy is limited in many hospitals in Namibia; secondly, there are factors that influence the inclusion of clinical pharmacy practice as part of the multidisciplinary team; and finally, there are practical opportunities that can be formulated to enable the practice of clinical pharmacy by gathering input from health professionals currently practising in private hospitals in Windhoek, Namibia.

1.3 Aim and Objectives

The overall aim of this study was to assess the current state of clinical pharmacy practice in private hospitals in Windhoek.

The specific objectives of this study are:

1) To assess current pharmacy practices relating to clinical pharmacy in private hospitals in Windhoek.
2) To investigate the level of acceptance and integration of clinical pharmacy practice into the multidisciplinary healthcare team practising in private hospitals in Windhoek.
3) To compare perspectives on clinical pharmacy practice in private health facilities between healthcare professions.

1.4 Significance of the study

Limited clinical practice involvement by pharmacists has been reported in both public and private hospitals in Namibia.[3] There is a broad awareness among pharmacists of the need for the implementation of clinical pharmacy services, but the extent to which these have been implemented remains limited. One major gap in implementing advanced clinical pharmacy services is the acceptance of other healthcare professionals; an area that needs to be further investigated. The study aimed to assess current practices and identify the perspectives of other key health professionals, which will aid in the implementation of clinical pharmacy services. This study contributes to raising awareness of clinical pharmacy amongst healthcare professionals, which may foster multidisciplinary working relationships within the healthcare teams.

The study focused on private hospitals in Windhoek as the clinical practice at private hospitals is not based on specified national treatment guidelines but on hospital-specific guidelines and individual practitioners' choice of treatment. The investigation into private healthcare has potential to impact the current practice of pharmacy and promote rational use of medication. The private healthcare industry has access to a vast array of treatment options, which opens the door to ensuring effective optimisation of treatment, which can greatly influence patient outcomes and cost of care. The study focused on private hospitals in Windhoek, Namibia, as the majority of leading private hospitals and healthcare practitioners are found in Windhoek and provide an indication of the current practice of clinical pharmacy in Namibia, which can potentially inform implementation strategies across the country.

1.5 Limitations of the study

Since this research focused on private hospitals in Windhoek, the results may not be representative or generalisable for other private hospitals in other towns, or for public hospitals

across the country. However, since the largest proportion of private hospitals, pharmacists, and specialists practice in Windhoek, focusing the research on Windhoek will have broad-reaching implications for the country.

Because Namibia has a small population of health professionals, one major limitation was sample size. To address this limitation, the survey was sent out with multiple reminders to all potential participants. Further, not all private hospitals in Windhoek gave permission to distribute the questionnaire, further shrinking the total sample size and limiting generalisability.

Some nurses and doctors work in more than one private hospital, leading to potential classification errors. This information was collected from participants to reduce the impact on the results.

Finally, the survey was self-designed as there was no previously validated tool available to answer the specific questions in this research. To improve validity, the tool was pilot-tested.

1.6 Delimitation of the study

The study only focused on private hospitals in Windhoek; it did not cover all private hospitals in Namibia and excluded public hospitals in Windhoek. A quantitative approach was chosen for this research to ensure that responses were focused and more participants could be included rather than taking a qualitative approach. Closed-ended questions were used in this survey and no open-ended questions were utilised in this study. The questionnaire was distributed electronically, hence, only healthcare professionals with access to electronic communications could participate.

2 LITERATURE REVIEW

Available literature regarding clinical pharmacy practice, clinical pharmacy implementation, hospital pharmacy practice, private and public hospital pharmacy practice, challenges in clinical pharmacy practice, and the FIP's Basel Statements were reviewed online. Search engines such as Google Scholar, emBASE, and PubMed were searched for articles published between the years 2000 and 2024. Articles relating to clinical pharmacy practice implementation in hospitals, clinical pharmacy practice within multidisciplinary teams, clinical pharmacy practice acceptance by healthcare professionals (HCPs), clinical pharmacy practice in developing countries and developed countries, challenges of implementing clinical pharmacy practice as well as articles including the FIP's Basel statements, were included in the literature review.

2.1 Clinical pharmacy practice

Clinical pharmacy practice is a patient-centric field of pharmacy with the aim of optimising therapeutic effects for patients and promoting health and wellness while minimising the risks and costs of therapeutic treatment.[9] The principle of clinical pharmacy originates from the practice of pharmaceutical care, a concept developed in the 1980s by Hepler and Strand.[11] According to Bhagavathula, Sarkar, and Patel,[12] the principles of pharmaceutical care include the determination of an individual patient's medical needs, the provision of required medication, and the provision of other required services to ensure safe and effective use of therapy and to ensure continuity of care. Clinical pharmacy thus enhances the distributive practice of pharmacy services to ensure holistic, evidence-based, and patient-centred care. According to Spinewine et al[13] and Bhagavathula et al[12] the practice of clinical pharmacy can only be a success if there are collaborative efforts amongst healthcare team members including medical practitioners, nurses and allied healthcare professionals. Although clinical pharmacy

is well developed in some high-income countries such as the United States, Canada, and the UK, this is not true for many other countries, especially in low- to middle-income countries (LMICs) as there is a lack of clinically trained professionals.[13]

2.2 Clinical pharmacy practice across the globe

Clinical pharmacy practice is a relatively new specialty compared to other areas of pharmacy practice. Across the globe, implementation of clinical pharmacy services varies greatly.[12,13] Several factors hinder the full implementation and practice of clinical pharmacy including availability of clinical pharmacy training for pharmacists, restrictions to scope of practice, financial and human resource limitations, and a low degree of acceptance by policy makers, hospital management, and other healthcare professionals.[12,14]

In high-income countries, the provision of clinical pharmacy services is also known to depend on available resources (financial and human) and healthcare systems.[12] Clinical pharmacist services can vary from simple prescription reviews to the prescribing of medication.[12] Overall, the level of implementation in high-income countries is more advanced compared to LMICs, where countries such as India, Pakistan, and South Africa have initiated and begun expanding clinical pharmacy practice.[10,12,14,15] Pharmacy clinical interventions in Africa have yielded good results.[16] For example, in Egypt and Ethiopia, a pharmacy intervention centre has led to decreased drug-related problems and improved medication adherence.[16] After the implementation of a Drug Information Centre staffed by clinical pharmacists in Nigeria, the acceptance rate of pharmacist drug therapy recommendations increased to 71%.[16] Similarly, an increase in the acceptance of pharmacist recommendations was observed in Kenya,[17] particularly with the introduction of long-acting reversible contraception among high-risk cardiovascular patients. In Sudan, a similar trend was seen with the implementation of

anticoagulation monitoring services.[18]However, there are areas for improvement regarding the implementation of clinical pharmacy in practice in LMICs broadly.[12,14]

Clinical pharmacists are well-positioned to complement the services of the prescribing doctors in hospitals as pharmacists are recognised as experts in therapeutics and are in regular contact with the prescribers and nurses.[19] In contrast to the situation in high-income countries (HICs), pharmacists in LMICs are still underutilised and their role as healthcare professionals is often not deemed important as they are often deemed relevant only in the distribution of pharmaceuticals and not in the clinical role. Hence clinical pharmacists do not fully maximise their therapeutic knowledge in ensuring optimal therapeutic use of medication and reduction of costs related to medication.[12,19,20] In many countries particularly in some countries of Africa and Asia, hospital pharmacists are focused mostly on dispensing and procurement roles while underutilising their expertise in medicine management.[21] Some of these tasks could be allocated to other staff members within the pharmacy who do not need to carry out clinical tasks, such as the pharmacist assistants and stock controllers, who are currently employed and running pharmacies in resource-limited African countries.[10]

Some of the major issues identified as barriers to effective pharmacy practice in LMICs include an acute shortage of qualified pharmacists and and the lack of nseparation of dispensing practices, especially in countries which allow medical practitioners to dispense.[16,20] African countries are some of the most affected when it comes to the shortage of pharmacists.[7,8] For example, in Ghana, it has been reported that only 619 pharmacists are serving 2.9 million people in greater Accra.[9] Namibia similarly has a shortage of pharmacists with a rate of 1:4000 which is about half of the phramcists recommended by WHO (1:2000).[3] The gap is especially large in the public sector compared to private settings, as most pharmacist in Namibia are in community pharmacy practice servicing the community pharmacies.[7] The practice of clinical

pharmacy in Africa is further inhibited by lack of trained clinical pharmacists as most curricula are not aligned to support the training of clinical pharmacists.[5,10,]

Despite the shortage of pharmacists in many African countries, clinical pharmacist services for inpatients have been reported to result in improved care, with no evidence of harm in countries where it has been initiated such as South Africa.[7,16] Njuguna et al[16] reported that there are various clinical pharmacy initiatives which have been implemented in other African countries, including Ethiopia, Nigeria, and Kenya which resulted in improved health outcomes. In South Africa, the Department of Health has invited clinical pharmacists to support the National Health Insurance in driving the rational drug utilisation and in the selection of essential drugs in order to improve health outcomes and in a cost-effective manner.[15]

2.3 Multi-disciplinary healthcare team

Clinical hospital pharmacists play a major role in the healthcare team in complementing the management of therapeutic treatment and the promotion of rational use of medication.[1] According to Kaboli et al [21], a multidisciplinary healthcare team is "an integrated team approach to healthcare in which medical and allied healthcare professionals consider all relevant treatment options and develop collaboratively an individual treatment plan for each patient.[21] An important aspect of multidisciplinary care is an emphasis on providing patient-centred care and improving the patient journey through communication, collaboration, and streamlining of diagnostics and therapeutics by utilising various healthcare professionals to effect this change.

Multidisciplinary care teams have been proven to improve patients' quality of care.[14] A systematic review by Kaboli, et al[21] highlighted the importance of collaboration between pharmacists and physicians, with participation in patient rounds seen as an essential component in the safety of medication use. It yielded positive outcomes on cost-effectiveness,

health-related quality of life, patient satisfaction, medication appropriateness, adverse drug events (ADEs), and adverse drug reactions (ADRs). The focus on patient-centred care in a multidisciplinary care team allows all healthcare professionals to harmonise their goals in care, improving the patient journey through communication and collaboration. Multidisciplinary care teams allow for frequent interaction within the team, which has been found to improve communication within the teams and prevented untoward events in healthcare system.[17] Ruiz-Ramos et al [22] and Kassam et al[23] observed the impact a pharmacist on enhacing the rational use of medicines and reducing adverse events, which in turn reduced patient hospital visits, and improved patient quality of life. Although there is adequate evidence on the benefit of the clinical pharmacist interventions as part of the multidisciplinary team, there is reluctance among healthcare team members to accept clinical pharmacists as part of the healthcare team and, in some instances, to trust their interventions.[16]

2.4 Basel Statements

In 2008, during an inaugural global conference on the future of hospital pharmacy hosted by FIP, representatives set out to develop consensus statements to promote the practice of hospital pharmacy around the world.[24] These statements aim to reflect global pharmacy's preferred vision of hospital pharmacy practice and ensure that hospital pharmacists are working toward a shared vision.[24] Although there are other tools used to assess the implementation of clinical pharmacy practice in hospitals, such as the clinical pharmacy key performance indicator (which focuses more on processes and less on the patients' outcomes),[25] the Basel statements, on the other hand, provide of a comprehensive outlook on hospital pharmacy practice. Their adoption has been supported by evidence-based practice in directing policies and practice standards in the evolving healthcare environment.[24] The statements on the future of hospital pharmacy highlighted the importance of hospital pharmacist engagement with health authorities and

hospital administrators in order to ensure adequate resources for the hospital's medicine use process. These statements also highlighted the value of interacting with the healthcare team on patient rounds, interviewing patients, reconciling medications, and providing patient discharge counselling and follow-up, all of which result in improved outcome.[2,4]

A study by Law at el[26] done in Ghana, Nigeria, Malawi, Uganda, Zambia and Zimbabwe found that a self-assessment tool adopted from the Basel statements can be used in areas of limited resources to improve pharmacy practice in areas which can impact the community at large. Hence these revised Basel statements provide an evidence based tool to utilise in the implementation and assessment of clinical pharmacy practice worldwide which can be adapted to fit local policies.[3,26]

2.5 Gaps in research

While the implementation of clinical pharmacy services has been documented in South Africa, Ghana and Nigeria, there is still a lot to be done in Namibia to assess the uptake of clinical pharmacy and its implementation. The implementation and uptake of clinical pharmacy services vary in public and private hospital pharmacies due to available human and pharmaceutical resources in these settings.[23] Since clinical pharmacy is relatively new in Africa and other healthcare professionals have not been exposed to it, it has been found that healthcare professionals may have a negative perception of the roles of clinical pharmacists as it seen to overlap with the roles of other health professionals.[23,17] Although clinical pharmacy has been shown to impact clinical outcomes and efficiency of clinical treatment, there is also evidence to support that it can influence the economic benefit of pharmacist-directed care of patients by preventing inappropriate treatment and minimising untoward medication events.[27] More research on the implementation of clinical pharmacy practice is needed in Southern Africa,

particularly outside of South Africa, with a focus on understanding the diverse perspectives of non-pharmacist healthcare professionals.

3 RESEARCH METHODS

3.1 Research Design

This was a non-experimental, cross-sectional study based on a self-administered questionnaire distributed electronically to participants via a Google Form link. The questionnaire was designed to assess healthcare professionals' perceptions of the level of clinical pharmacy practice in private hospitals by using the Basel assessment tools of clinical pharmacy practice.

3.2 Population

The study population included all nurses, pharmacists, and medical doctors who work in any of the three private hospitals in Windhoek, that gave permission to participate. This population was estimated to be approximately 200 people, the majority of whom would be nurses.

3.3 Sample

This study used a non-probability sampling method, specifically purposive sampling, to ensure that all eligible participants were invited to participate. The questionnaire was distributed electronically to all employees (doctors, nurses, and pharmacists) who worked in one or more of the included private hospitals. The total potential population was estimated at 200 healthcare providers based on the researcher's knowledge of the number of health care professionals working at the hospitals. All participants who met the inclusion criteria were invited to participate in the research. A goal response rate of 60% was sought because of the small total population, although response rates to online surveys often fall below this goal.[28,29]

3.4 Research Instruments

The questionnaire was developed by adaptating of the clinical pharmacy Basel statements, which were developed by the International Pharmaceutical Federation.[4] The final questionnaire included questions developed from five of the themes in the Basel statements namely: Theme 2 (Influence on Prescribing), Theme: 3 (Preparation and delivery), Theme 4 (Administration), Theme 5 (Monitoring of Medication Use), and Theme 6 (Human Resource Training and Development). These themes were selected because they were determined to be most relevant to the implementation of clinical pharmacy services as they would give insight on the current practice and inform gaps to be targeted for implementation.

The research tool was piloted among 10 health care professionals to assess the practicality, usability, and validity of the research tool in measuring the intended variables. The pilot study tested how well the tool collected data, whether participants understood the tool's instructions, and if the data collected aligned with the research objectives. Adjustments were made to the tool in order to enhance clarity of questions and to improve its format. The final tool is available in Annexure 3. It was distributed as a Google Form to increase the simplicity of response.

Section 1 included demographic information of the respondents. Section 2 included questions related to which clinical services were offered at their hospital. Finally, section 3 asked participants to rate their perspectives on clinical pharmacy practices using a 7-point Likert scale. This scale served as a tool to quantify and measure respondents' opinions regarding clinical pharmacy practices. It allowed for the assessment of the extent to which respondents agreed or disagreed with specific statements related to clinical pharmacy practices.

3.5 Procedure

After ethical approval from the University of Namibia Decentralised Ethics Committee and the Ministry of Health and Social Services Human Ethics Committee, permission from each private

hospital in Windhoek was sought prior to distribution. Three of the four private hospitals provided permission to distribute the questionnaire. Participant emails were received from the database of doctors in the respective hospitals' email address book; WhatsApp messages were sent to the hospital administrators to further disseminate to their respective employee groups, including nurses and pharmacists.

The questionnaire was distributed via electronic mail, and the link was also send via WhatsApp to all doctors, nurses, and pharmacists at the approved institutions. After receiving the invitation email or link via WhatsApp, participants were directed to a Google Form to complete the questionnaire. The first page included a consent script that described the research, as well as the risks and benefits. The participants who accepted the consent were directed to the full questionnaire, which took approximately 10 minutes to complete. No incentives were provided for participants. Reminders were sent out to the professionals via various platforms on five occasions, two weeks apart, to increase the response rate.

3.6 Data analysis

The data collected in the Google Form was downloaded as an Excel file. The data was then cleaned to remove incomplete submissions and duplicates. Data were analysed using Statistical Package for the Social Sciences (SPSS v27) and Excel to extract meaningful insights and draw conclusions from the collected data. Descriptive statistics, such as frequencies, means and standard deviations, and medians and interquartile ranges (IQRs) were employed to provide a clear and concise representation of the data. Likert scale analysis was based both on mean ± standard deviation and median (IQR).[29]

To investigate potential associations between the independent variables and clinical pharmacy practices, the Fisher-Freeman Exact Test was used. This test is used in similar situations to a Chi-square test but is used when the cell counts are less than 5 and the contingency table is

greater than 2x2.[30] This statistical test was employed to determine whether the independent variables exerted a statistically significant influence on clinical pharmacy practices and played a crucial role in unveiling any relationships between explanatory variables, shedding light on factors that might impact clinical pharmacy practices. The Cramer's V statistic was used to evaluate the strength of the association between categorical variables. This test is similar to the phi statistic, but is used when there are more than two categories being compared. Cramer's V scores of ≥ 0.5 are considered strongly associated; 0.3-0.49 moderately associated; 0.1-0.29 weakly associated and <0.1 are minimally or not correlated.

4 RESEARCH ETHICS

Ethical approval was obtained from the University of Namibia Centre for Research Services on 19/11/2021 and the Ministry of Health and Social Services Research Committee, reference: 22/4/2/3 (Annexures 1 and 2). All participating healthcare professionals gave informed consent to take part in the study (Annexure 3). Names of the participants were not recorded; only their professional category and institution of employment were noted to protect confidentiality. To protect the specific institutions, hospitals were labelled as Hospital A, B, C, or D in the results and discussion. The reminders were sent to all potential participants; emails and IP addresses were not collected in the Google Form.

The data collected will be shared with the specific hospitals who gave permission for the purpose of improvement initiatives. Any data collected will only be accessible to the researcher, individual hospital administrators of hospitals that participated in the survey, and will be destroyed after 3 years from publication. Specific permission for publication will be sought prior to dissemination.

5 RESULTS

This chapter is dedicated to the presentation, analysis and discussion of the results. The data collected are presented in text and graphically, including tables and figures.

5.1 Demographics

Section 1 of the questionnaire collected general demographic information, namely the category of healthcare professional and the site/hospital. A total of 53 healthcare professionals completed the questionnaires between July and August of 2023; additional data collection focuses on pharmacists was conducted in October 2024. Of those completing the survey 60% (n=32) were nurses, 18% (n=10) were pharmacists, and 20% (n=11) were doctors. Of the doctors, four (36%) were general practitioners and seven (64%) were specialists. This represented an overall response rate of approximately 26%, which was lower than the target of 60% despite multiple reminders over a period of 4 months.

While all four private hospitals were initially approached about participation, only three private hospitals provided permission. To protect the anonymity of the hospitals, the hospitals will be referred to as Hospital A, Hospital B, and Hospital C. The questionnaire was not distributed to employees of the fourth hospital, although some medical staff who work at more than one hospital submitted responses. This hospital will be referred to as Hospital D. The majority of respondents (n=44, 83%) work at Hospital A, while fewer work at hospital B (n=9, 17%) and hospital C (n=7, 13%). Five participants (9%) reported that they work at hospital D. The total number in the hospital category adds up to more than the total sample because some staff work at more than one hospital. Detailed demographics are provided in Table 1.

Table 1: Demographics of respondents (n=53)

VARIABLE	CATEGORY	N (%)
PROFESSION	Doctor*	11 (20.8)
	Nurse	32 (60.4)
	Pharmacist	10 (18.9)
HOSPITAL	Hospital A	44 (83.0)
	Hospital B	9 (17.0)
	Hospital C	7 (13.2)
	Hospital D	5 (9.4)

* Doctor includes 4 GPs and 7 specialists

Table 2 provides a detailed breakdown of the health professionals who took part in the survey. Hospital A had the most respondents across all profession categories, and the majority of nurse's respondents from Hospital A made up the 30 respondents of the 32 total nurse responses. The doctors and pharmacists were distributed across all hospitals although there were no pharmacists from Hospital D, which is expected as no questionnaires were distributed to this hospital.

Table 2: Distribution of health profession responses by institution (n=53)

		Institution				
		Hospital A	*Hospital B*	*Hospital C*	*Hospital D*	**TOTAL**
Health profession	*Doctor*	9	3	4	5	11
	Nurse	30	2	0	0	32
	Pharmacist	5	4	3	0	10
	TOTAL	44	9	7	5	53

5.2 Hospital Clinical Pharmacy Practice

5.2.1 Awareness of clinical pharmacy practice

Participants were asked about the implementation of clinical pharmacy practices at their respective hospitals. A substantial majority 71% (n=37), confirmed their awareness of such services being present. On the other hand, 17% (n=9) of participants expressed uncertainty regarding the existence of clinical pharmacy services at their hospital and 11% (n=6) of participants reported that no clinical pharmacy services were available at their specific healthcare institution.

When reviewing this data based on health profession, the highest rates of awareness of clinical pharmacy practice occurred among nurses (n=27, 87%) and doctors (n=6, 54.5%). Pharmacists were less aware of these services (n=10, 40%). There was a statistically significant difference between participants' profession and their perceptions of clinical pharmacy practices (p-value=0.008) with a moderate effect size (Cramer's V=0.339, p-value=0.018).

When reviewing based on hospital, 72% of participants (n=31) at Hospital A were aware of clinical pharmacy services, while this number was lower at Hospital B (n=5, 55%), and C (n=1, 14%). There was a statistically significant difference between the level of awareness between the hospitals (p-value=0.010) with moderate effect size (Cramer's V=0.312, p-value=0.022). These results are presented in Table 3.

Table 3: Awareness of Clinical pharmacy services by profession and institution (n=52)*

Variable	Category	Yes n (%)	Unsure n (%)	No n (%)	Fisher Freeman Exact Test (p-value)	Cramer's V (p-value)
Overall		37 (71.2)	9 (17.3)	6 (11.5)		
Profession	*Doctor*	6 (54.5)	4 (36.4)	1 (9.1)		0.339
	Nurse	27 (87.1)	2 (6.5)	2 (6.5)	0.008	(0.018)
	Pharmacist	4 (40)	3 (30)	3 (30)		
Hospital	*Hospital A*	31 (72.1)	7 (16.3)	5 (11.6)		0.312
	Hospital B	5 (55.6)	4 (44.4)	0 (0)	0.010	(0.022)
	Hospital C	1 (14.3)	4 (57.1)	2 (28.6)		

* *All participants did not respond to this question*

5.2.2 Available clinical pharmacy services

An analysis of the type of clinical services offered and the institutions at which they are offered was made to ascertain which services are perceived as the pharmacist's responsibility by the health professionals. Importantly, not all health professionals at each specific hospital agreed on which specific clinical pharmacy services were available. The majority (79%) of health professionals in Hospital A indicated that pharmacists are responsible for safe medication use, while fewer at Hospital B (33%) and Hospital C (42%) identified this service. This difference was statistically significant ($p<0.05$). A high number of respondents from Hospital B (66%) and Hospital A (68%) agreed that pharmacists are responsible for cost-effective medication use at their hospital. Other higher-level clinical pharmacy services (such as renal dosing and therapeutic drug monitoring) were reported as less available according to the respondents. Figure 1 highlights the differences in available clinical services across the three hospitals. There was a statistically significant difference between the availability of therapeutic drug monitoring between different institutions (p-value<0.05).

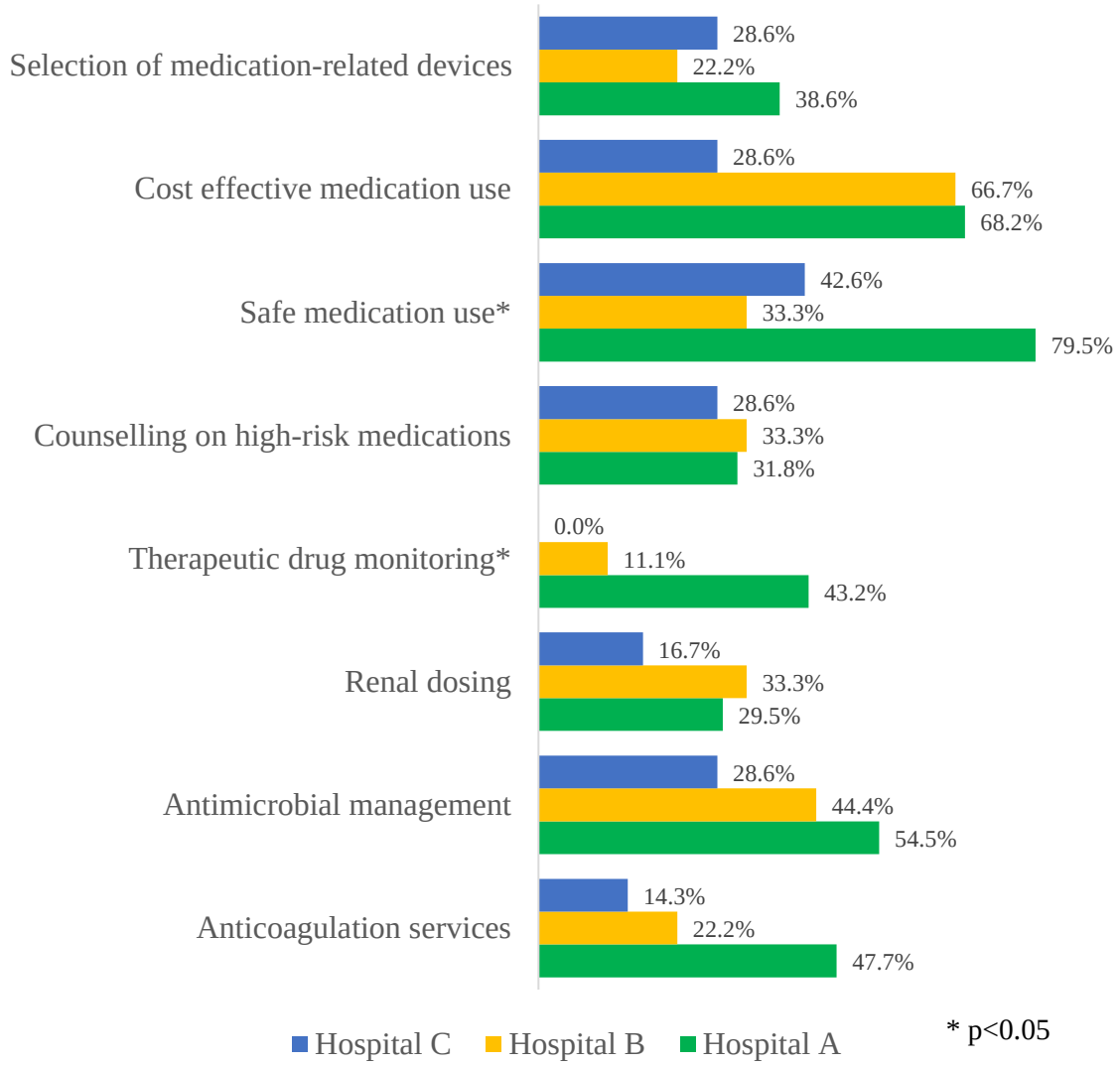


Figure 1: Participant perceptions of pharmacist's responsibilities and clinical pharmacy services available by institution

5.2.3 Accessibility of pharmacists

A significant majority (n=34, 65%) indicated that pharmacists are always accessible to all healthcare providers. Around 23% (n=12) of respondents stated that pharmacists are accessible only during specific hours of the day. Five participants (9%) noted that pharmacists currently do not serve as points of contact for healthcare providers. Additionally, a minority (3%, n=2) of participants mentioned that pharmacists are accessible exclusively to certain healthcare

providers, rather than to all. Table 4 portrays participants' perceptions of the accessibility of hospital pharmacists as points of contact for other healthcare providers.

Table 4: Participant perception of pharmacist accessibility (n=52)*

Response	n (%)
Always accessible	34 (65.4)
Accessible only during specific hours	12 (23.1)
Only accessible to certain healthcare providers	2 (3.8)
Not accessible	5 (9.6)

* More than one response was possible and not all participants answered the question.

Table 5 illustrates the participants' perceptions regarding the accessibility of hospital pharmacists as points of contact for other healthcare providers, differentiating between professions and hospitals. All pharmacist respondents (n=10, 100%) felt that pharmacists were always accessible, more than half of nurses (n=18, 58%) and fewer doctors (n=6, 54%) agreed. There was no statistically significant difference observed in the perception of pharmacist accessibility among the various professions (p-value=0.067), nor between hospitals (p-value = 0.972).

Table 5: Participant perception of accessibility of pharmacists

Variable	Category	Always accessible n (%)	Sometimes accessible* n (%)	Not accessible n (%)	Fisher Freeman Exact Test (p-value)	Cramer's V (p-value)
Overall		34 (65.4)	13 (25)	5 (9.6)		
Profession	*Doctor*	6 (54.5)	4 (36.4)	0 (0)	0.067	0.293 (0.063)
	Nurse	18 (58.1)	9 (29.0)	5 (16.1)		
	Pharmacist	10 (100)	0 (0)	0 (0)		
Hospital	*Hospital A*	26 (60.5)	12 (27.9)	5 (11.6)	0.972	0.131 (0.744)
	Hospital B	6 (66.7)	2 (22.2)	0 (0)		
	Hospital C	4 (57.1)	2 (28.6)	0 (0)		

* Includes those that responded that pharmacists are accessible only at certain times of the day or to only certain healthcare providers.

5.2.4 Perception of pharmacists on the multi-disciplinary team

Participants were asked to share their perceptions regarding the inclusion of pharmacists as members of a multidisciplinary team responsible for making therapeutic decisions. The findings are depicted in Table 6, where the majority of respondents (66%, n=35) affirmed that pharmacists are integral to multidisciplinary teams. However, 20% (n=11) expressed uncertainty on the matter, while 13% (n=7) stated that they do not consider pharmacists to be part of the multidisciplinary team responsible for therapeutic decisions. No association found among the professionals (p-value=0.081) nor among different hospitals (p-value = 0.183).

Table 6: Participant perceptions of the inclusion of pharmacists on the multidisciplinary team (n=52)*

Variable	Category	Yes n (%)	Unsure n (%)	No n (%)	Fisher Freeman Exact Test (p-value)	Cramer's V (p-value)
Overall		35 (66.0)	11(20.8)	7 (13.2)		
Profession	*Doctor*	4 (26.4)	4 (36.4)	3 (27.3)		
	Nurse	25 (78.1)	5 (15.6)	2 (6.3)	0.081	0.259 (0.131)
	Pharmacist	6 (60)	2 (20)	2 (20)		
Hospital	*Hospital A*	29 (65.9)	9 (20.5)	6 (13.6)		
	Hospital B	4 (44.4)	4 (44.4)	1 (11.1)	0.183	0.208 (0.268)
	Hospital C	2 (28.6)	3 (42.9)	2 (28.6)		

*not all participants answered the question

Participants' perceptions concerning the integration of pharmacists as members of a multidisciplinary team responsible for making therapeutic decisions were examined, with consideration given to differences among professions and hospitals (Table 7). A greater percentage of nurses (n=17, 53%) believe that pharmacists are an integral part of the multidisciplinary team than pharmacists (n=4, 40%) and doctors (n=2, 18%). There were no statistically significant differences between perceptions by profession (p-value = 0.200) or by hospital (p-value = 0.578).

Table 7: Participant perception of the extent of pharmacist involvement by profession and institution (n=53)

Variable	Category	All or most care areas n (%)	Some or a few care areas n (%)	No care areas n (%)	Fisher Freeman Exact Test (p-value)	Cramer's V (p-value)
Overall		23 (43.4)	25 (47.2)	5 (9.4)		
Profession	*Doctor*	2 (18.2)	7 (63.4)	2 (18.2)		
	Nurse	17 (53.1)	12 (37.5)	3 (9.4)	0.200	0.234 (0.216)
	Pharmacist	4 (40)	6 (60)	0 (0)		
Hospital	*Hospital A*	18 (40.9)	21 (47.7)	5 (11.4)		
	Hospital B	3 (33.3)	4 (44.4)	2 (22.2)	0.572	0.147 (0.625)
	Hospital C	1 (13.3)	5 (71.4)	1 (14.3)		

5.2.5 Pharmacists involvement in patient care areas and patient care rounds

Participants were queried regarding the extent of pharmacist involvement in various patient care areas within their respective hospitals. As shown in Table 8, the majority of doctors (n=9, 81%), half of the pharmacists (n=5, 50%) and half of the nurses (n=18, 56%) expressed that pharmacists do not actively participate in ward rounds with other healthcare professionals. Conversely, only 50% (n=5) of pharmacists indicated that the pharmacists participate in some or a few ward rounds. Most participants, regardless of hospital or profession, felt that pharmacists were not involved in patient ward rounds, with doctors having the highest reported rate (n=9, 82%). There were no significant differences in the perceptions of respondents regarding the involvement of pharmacists in ward rounds among health professionals (p-value=0.124) or among institutions (p-value=0.550).

Table 8: Participant perceptions of pharmacist participation in ward rounds by profession and institution (n=53)

Variable	Category	All ward rounds n (%)	Some or a few ward rounds n (%)	No ward rounds n (%)	Fisher Freeman Exact Test (p-value)	Cramer's V (p-value)
Overall		5 (9.4)	16 (30.2)	32 (60.4)		
Profession	*Doctor*	0 (0)	2 (18.2)	9 (81.8)		
	Nurse	5 (15.6)	9 (28.1)	18 (56.3)	0.124	0.243 (0.181)
	Pharmacist	0 (0)	5 (50)	5 (50)		
Hospital	*Hospital A*	4 (9.1)	12 (27.3)	28 (63.6)		
	Hospital B	1 (11.1)	4 (44.4)	4 (44.4)	0.550	0.160 (0.523)
	Hospital C	0 (0)	1 (14.3)	6 (85.7)		

5.2.6 Pharmacists access to and documentation in patient's records

The study inquired about participants' perceptions regarding pharmacist access to patient records. Table 9 summarizes that most pharmacists (n=7, 70%) believed that pharmacists have access to all patient records (paper and electronic records), compared to 59% of nurses (n=19) and 45% of doctors (n=5). However, there was no statistically significant association between participants' perceptions among professions (p-value=0.661) or the hospital (p-value=0.844) regarding pharmacists access to patient records.

Table 9: Participant perceptions of pharmacist access to medical records by profession and institution (n=53)

Variable	Category	Yes n (%)	Unsure n (%)	No n (%)	Fisher Freeman Exact Test (p-value)	Cramer's V (p-value)
Overall		31 (58.5)	14 (26.4)	8 (26.4)		
Profession	*Doctor*	5 (45.5)	5 (45.5)	1 (9.1)	0.661	0.173 (0.528)
	Nurse	19 (59.4)	7 (21.9)	6 (18.8)		
	Pharmacist	7 (70)	2 (20)	1 (10)		
Hospital	*Hospital A*	26 (59.1)	12 (27.3)	6 (13.6)	0.844	0.104 (0.860)
	Hospital B	5 (55.6)	2 (22.2)	2 (22.2)		
	Hospital C	3 (42.9)	3 (42.9)	1 (14.3)		

Overall, participants felt that pharmacists rarely or never document in the patient's medical record (n=26, 59%), whereas 32% (n=17) felt that pharmacists always or most of the time document in the medical record. There was no statistically significant difference between professions or hospitals. These results are depicted in Table10.

Table 10: Participant perceptions of pharmacist documentation in the medical record by profession and institution (n=50)*

Variable	Category	Always or most of the time n (%)	Some-times n (%)	Rarely or never n (%)	Fisher Freeman Exact Test (p-value)	Cramer's V (p-value)
Overall		17 (32.1)	7 (13.2)	26 (49.1)		
Profession	*Doctor*	2 (18.2)	1 (9.1)	6 (54.5)	0.424	0.205 (0.380)
	Nurse	9 (28.1)	5 (15.6)	17 (53.1)		
	Pharmacist	6 (60)	1 (10)	3 (30)		
Hospital	*Hospital A*	14 (31.9)	7 15.9)	20 (45.5)	0.197	0.255 (0.127)
	Hospital B	3 (33.3)	0 (0)	5 (55.6)		
	Hospital C	5 (71.4)	0 (0)	1 (14.3)		

5.2.7 Clinical pharmacy practice and the Basel Statements

Participants were asked to rate their agreement using a 10-item 5-point Likert scale to several statements about clinical pharmacy practice that were derived from the Basel Statements. A score of 5 indicated strong agreement, while a score of 1 indicated strong disagreement. These responses are summarised in Table 11. Almost all items were rated between 3 and 4, meaning that participants were either neutral or in agreement with the statements.

The statements with the highest general agreement included that the role of clinical pharmacists was critical for positive patient outcomes (4.09 ±1.31), that clinical pharmacists play a key role in addressing antimicrobial resistance (4.08±1.31), that clinical pharmacists play a key role in preventing adverse reactions (4.02±1.35), and that they are open to the recommendations of a clinical pharmacist (4.00±1.32). The statements with the least agreement were that there are adequate pharmacists to perform activities at the institution (2.75 ±1.36) and that pharmacists make interventions on patients' treatment (3.34±1.37).

Table 11: Clinical pharmacy practice perception by healthcare workers

Item	Mean (SD)	Median (IQR)
1. Is the role of pharmacists/clinical pharmacist vital to patient's outcome?	4.09 (1.31)	5 (4-5)
2. Is there an opportunity for active clinical pharmacy in our current practice?	3.81 (1.27)	4 (3-5)
3. Are clinical pharmacists/pharmacists considered part of the multi-disciplinary team of care?	3.91 (1.36)	4 (3.5-5)
4. Do clinical pharmacists/pharmacists make interventions on patient's treatment?	3.34 (1.37)	4 (2-4.5)
5. Are you open to clinical pharmacist's recommendations and interventions?	4.00 (1.32)	4 (4-5)
6. Are there adequate pharmacists to ensure the adequate interventions by pharmacists at your facility?	2.75 (1.36)	2 (2-4)
7. Is there a need for pharmacists to be further trained in order to carry out clinical pharmacy services?	3.70 (1.22)	4 (3-5)
8. Should clinical pharmacists be available for consultations 24hours in a hospital?	3.96 (1.39)	5 (3.5-5)
9. Do pharmacists/clinical pharmacists play a role in preventing antimicrobial resistance?	4.08 (1.31)	5 (4-5)
10. Do pharmacists/clinical pharmacists play a role in preventing adverse drug events?	4.02 (1.35)	4 (3.25-5)

After reviewing the overall responses, the data were compared between professions. This is displayed in Table 12. Overall, there was similarity for most responses, regardless of profession. However there was a significant difference in the perception of health professionals regarding two of the ten items. First, none of the pharmacists felt that there were adequate pharmacists to ensure sufficient clinical pharmacy practice in the various hospitals, while 90% of doctors felt that the number of pharmacists was adequate (p-value=0.002; Cramer's V=0.400). It has also been found that there is a difference in the perception of professionals regarding the opportunties for active clinical pharmacy practice. Only 55% of nurses agreed with this statement, while 100% of doctors and 90% of pharmacists agreed (p-value=0.042; Cramer's V=0.305).

Question	Response by profession	Cramer's V (p-value)
Q1 Is the role o .f pharmacists/clinical pharmacist vital to patient's outcome?		0.198 (p=0.383)
Q2 Is there an opportunity for active clinical pharmacy in our current practice?		0.305 (p=0.043)
Q3 Are clinical pharmacists/ pharmacists considered part of the multi-disciplinary team?		0.126 (p=0.796)
Q4 Do clinical pharmacists/ pharmacists make interventions on patient's treatment?		0.190 (p=0.432)
Q5 Are you open to clinical pharmacist's recommendations and interventions?		0.254 (p=0.145)
Q6 Are there adequate pharmacists to ensure adequate interventions by pharmacists at your facility?		0.400 (p=0.002)
Q7 Is there a need for pharmacists to be further trained in order to carry out clinical pharmacy services?		0.267 (p=0.109)
Q8 Should clinical pharmacists be available for consultations 24hours in a hospital?		0.243 (p=0.182)
Q9 Do pharmacists/ clinical pharmacists play a role in preventing antimicrobial resistance?		0.179 (p=0.495)
Q10 Do pharmacists/ clinical pharmacists play a role in preventing adverse drug events?		0.269 (p=0.111)

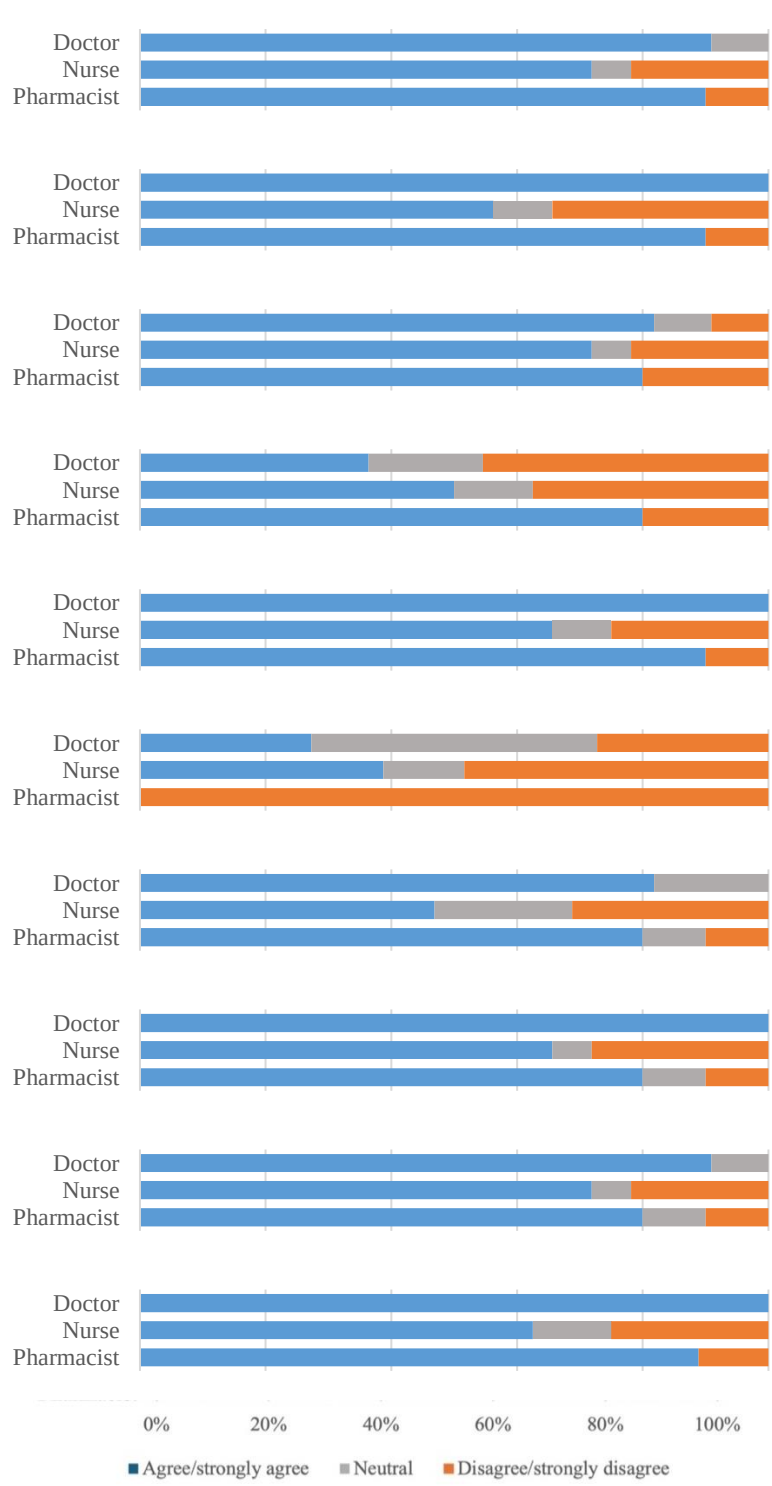


Figure 2:Participants perception of clinical pharmacy services by profession

6 DISCUSSION

This chapter presents the discussion of the findings illustrated in the above results. This section, in addition, presents the objectives of the study in relation to the research findings.

6.1 Demographics

The response rate for the survey despite multiple reminders remained low at approximately 26% of the total eligible population, with a final study sample of 53 participants. These lower rates are often observed in online surveys, especially among healthcare professions. A study amongst specialist physicians yielded similar results with a response rate of 35% recorded in an online survey distributed among 904 medical professionals from various specialities.[30]

The predominant group of healthcare professionals who participated in the study were primarily nurses, which is expected, as nurses make up the majority of healthcare professional workforce, including in Windhoek. Karan et al[31] agree with this in a study done in India, where the number of nurses registered was 40% while doctors and pharmacists both accounted for 20%, meaning there are more nurses in healthcare than doctors and pharmacists. Hence, we expected a higher number of responses from nurses than other health professionals due to staffing models employed by healthcare institutions. The specialists and general practitioners who participated in the study represented 13% and 7% of the sample, respectively, while the pharmacists represented 18%. The specialists' response rate is, unfortunately, low but it aligns with the fact that physicians tend to have lower response rates amongst all healthcare professionals. Studies have shown that there tends to be a generally low response rate amongst healthcare professionals, with the response rate of less than 50% amongst general practitioners and even lower (less than 35%) amongst specialist physicians.[22,23,30] The pharmacist response rate in this study likely includes all of the pharmacists that could be sampled, based on the total number of pharmacists known to be employed at each of the three hospitals.

These demographics, reflected by the results are mostly obtained from healthcare professionals working at Hospital A which is where the primary investigator is employed as the chief pharmacist. Responses from other private hospitals were found to be much lower. Response rate amongst health professionals is known to be generally low in research, this has been attributed to the fact that there is limited time to access these professionals to respond to surveys, and due to lack of incentives for them to complete surveys.[30] Healthcare professionals often cite lack of time and survey burden as reasons for not responding to online surveys. It has been found that in order to increase response rates amongst healthcare professionals it is vital to include small incentives for the participants for higher response rates.[21-22] Unfortunately, this was an unfunded study and incentives were not possible.

Importantly, some health professionals work in more than one hospital. Although the responses from the other hospitals might be low compared to Hospital A, it is important to note that, in Namibia, due to limited numbers of healthcare professionals, many staff work at multiple or even all hospitals in Windhoek. Hence, their input can be taken as representative of practice in the private hospitals in Windhoek.[5]

6.2 Hospital clinical pharmacy practice in Namibia

6.2.1 Awareness of implementations and practice in healthcare facilities

Clinical pharmacy practice is defined as "a health science discipline in which pharmacists provide patient care that optimises medication therapy and promotes health, wellness, and disease prevention… while embracing the philosophy of pharmaceutical care".[12] The role of clinical pharmacists differs somewhat from that of traditional pharmacists in that they work directly with providers and patients to provide services that promote safe, effective, and cost-conscious drug therapy and improve patient outcomes and are not simply associated with the dispensing of drugs.[12-13]

The majority of participants (71%) indicated that they have a general awareness of the implementation of hospital clinical pharmacy practice in the facilities they work in, which is positive as it reflects the roles of clinical pharmacy are being activated in health institutions. A marginal number (17%) of participants expressed uncertainty regarding the implementation of clinical pharmacy in their hospitals, which could be attributed to the fact that there might be limited knowledge or lack of awareness amongst healthcare professionals of the different clinical pharmacy services provided in hospitals.[7,12] A significant number of healthcare professionals at Hospital A are well informed about clinical pharmacy services in their hospital, as 72% indicated they are aware of the practice.

The data in Table 3 indicate that there is a difference in the awareness of clinical pharmacy between various HCPs working in private hospitals in Windhoek. The results obtained indicated that nurses have the highest level of awareness amongst all professionals, followed by doctors, and finally pharmacists. This is an interesting finding. Nurses have significant connection to pharmacists on a daily basis and often seek advice on administration and patient medication needs, which may explain why nurses had high awareness of the pharmacist's clinical role. Recent studies indicate that although awareness of clinical pharmacist practice awareness is well-versed amongst healthcare professionals, there is still a lack of perceived recognition of the impact of clinical pharmacists amongst physicians which is largely related to poor communication mechanisms between these two groups regarding patient care.[23] The low agreement from pharmacists may indicate a lack of acknowledgement of their own role in healthcare. It may also highlight that pharmacists have a higher level of expectation when it comes to a clinical pharmacy service than other colleagues.

There was a significant difference between the levels of awareness between the hospitals in Table 3. This can be attributed to hospital-specific internal policies and the variable implementation of pharmacy practice across hospitals.[3,7] In some hospitals, implementation of

hospital pharmacy is assessed using the Basel Statement tier system which considers the advancement of pharmacy practice, availability of resources per institution, training and support of pharmacy personnel to identify gaps in practice.[15] The variation in implementation of clinical pharmacy practices across hospitals may also play a role in influencing the perception of clinical pharmacy practice amongst healthcare professionals practicing in different facilities.

6.2.2 Available clinical pharmacy services

Clinical pharmacists are involved in various services within the hospital to ensure improved health outcomes and enhance the quality of life. The perception of health professionals varied across institutions regarding the available pharmacist services as displayed in Figure 1. The role of pharmacists in various clinical practice services is acknowledged by other healthcare professionals, especially in the area of cost-effective medication use, safe medication use, and antimicrobial stewardship. Studies have shown that in institutions where clinical pharmacy services are practiced, there has been evidence of cost-effective treatment of medical conditions, reducing the cost of treatment, while at the same time, improving health outcomes and overall quality of life for patients.[32]

Hospital A had high scores compared to other hospitals in most of the services assessed This may be attributed to the sensitivity of the role of the pharmacist amongst health professionals in Hospital A. It is also noted that some services such as renal dosing, anticoagulation's services, drug therapeutic monitoring ,and selection of medication devices, scored low. This result can be attributed to the availability of pharmacists in those institutions to carry out such services as well as the nature of medical cases seen at various healthcare institutions. It is interesting to note that some health professionals felt that pharmacists were involved in more clinical pharmacy services than the hospitals provide, outside of the typical scope of a hospital

pharmacist. For instance, to our knowledge, none of the included hospitals have a formal therapeutic drug monitoring service, an anticoagulation service, or a renal dosing programme. That many health professionals felt these were currently available highlights the opportunities for pharmacists to fill the gap.

6.2.3 Accessibility of pharmacists

The pharmacists in hospitals in Windhoek work as office or administrative staff, with a working shift of eight hours. There is an on-call pharmacist after normal working hours in all of the included hospitals. In most instances the hospitals do not offer 24-hour pharmaceutical services. At each hospital however, there is a provision of an after- hours cupboard/emergency pharmacy to supply urgently required medications. In addition, pharmaceutical services after hours in private hospitals are also provided by means of having access to a pharmacist on call to provide consultative services and if necessary, to provide onsite pharmaceutical services. The participants were asked about their perception of the accessibility of pharmacists in hospitals to serve as a point of contact for healthcare providers. The majority of participants as illustrated in Table 4, indicated that the pharmacists are always accessible to all healthcare providers.

Although the pharmacists perceive themselves to be always available, the doctors and the nurses indicated that they are only available sometimes. This data might indicate that some of the healthcare professionals are not aware of the means of accessing the pharmacist especially after hours. There was no significant difference in the perception of the health professionals or between different institutions in the accessibility of pharmacists. This may be because all of the included hospitals have similar after-hours policies. The results of this study indicates that there should be enhanced awareness amongst other health professionals on the means of accessing a pharmacist after hours to enable them to utilize the pharmacist services whenever

it is required. Although the ratio of pharmacists to patients in Namibian private hospital pharmacies is better compared to public hospitals, the shortage of pharmacists is still a reality and hence the accessibility and provision of pharmaceutical services is to a large extent affected.[3,9] For instance, most of the hospitals included have approximately three full-time pharmacists on staff. From the results it is evident that the pharmacists perhaps make themselves available but they are underutilised or the available resources may not be sufficient to meet the demand. Pharmacist accessibility in a healthcare facility is essential and can greatly contribute to the safe and effective use of medication and prevent untoward events as a result in appropriate use of medications.[15,23]

6.2.4 Perception of pharmacists on the multi-disciplinary team

A study conducted in the UK among multidisciplinary care team members in healthcare described the value of pharmacists.[2223] Further, the described how the team members frequently seek pharmacists' advice and accept the role of a pharmacist in the multidisciplinary team. However in Africa and many developing countries the inclusion of pharmacists into multidisciplinary teams is yet to become a reality, as pharmacists are not always acknowledged as part of the multidisciplinary team.[5,]

This study assessed the perception of health professionals on the inclusion of pharmacists as multidisciplinary team members responsible for making decisions. The findings highlight that most respondents, particularly nurses, believe that pharmacists are indeed an integral part of the multidisciplinary care team in making therapeutic decisions. This study also found that although various professionals had varied perceptions on the inclusion of pharmacists on the multidisciplinary team, the variation was not significantly different. Researchers have found that in order for clinical pharmacists to influence the prescribing of medicines and improve patients medical outcomes, pharmacists have to be an integral part of the multidisciplinary team

responsible for therapeutic decision in patient care areas.[23] The results of this study suggest that the framework exists for expanded roles for pharmacists.

6.2.5 Pharmacist involvement in patient care areas and patient care rounds

Clinical pharmacy practice involves the provision of patient care to optimise medication therapy and promote health, wellness, patient safety, and disease prevention.[15] This highlights the vital role pharmacists in all care areas for better patient outcomes . The Basel Statements in Theme 2 highlighted the importance of clinical pharmacist involvement in therapeutic decision-making in all patient areas of care.[4]

This study found that some respondents believe that pharmacists are involved in only some care areas of patient care implying that there are still patient areas where pharmacists are not involved, meaning that there are opportunities for improvement. Pharmacists, being the custodians of medicines, should be involved in all areas of patient care ensuring that the pharmaceutical needs of all patients are met for improved patient outcomes.

In addition, the perception of participants on the engagement of pharmacists in patient care rounds was also assessed where the study found that pharmacists are not actively involved in patients care rounds with more than half of participants confirming the pharmacists' lack of participation in patients care rounds. It is important to acknowledge that pharmacists are stationed in the pharmacy throughout the day. None of the hospitals currently have physician-order entry systems, meaning that all order verification must occur in the physical pharmacy. This often means that there are few opportunities for pharmacists to visit the ward, both due to limited human resources in pharmacy, but also due to the structure of treating doctors' ward rounds. None of the hospitals in the study use a hospitalist system, meaning that individual admitting doctors round on their own patients with unscheduled ward rounds taking place throughout the day. It is of importance that pharmacists are involved in patient care rounds to

identify and assess patients' treatment plans and identify potential unmet pharmaceutical needs of patients.[33] New and creative models to address the structural challenges in private hospitals in Namibia will be required to allow pharmacists to continue to advance practice.

6.2.6 Pharmacists access to documentation in patient records

Patient records are vital documents for the medical history of the patient and include medication orders, medication administration records, laboratory and imaging data, admission notes, and doctor and nurse progress notes. The medical records are used by pharmacists to evaluate therapy, aid in the monitoring of administered therapy, and reconcile medications across transitions of care.[33] A clinical pharmacist's main role is to ensure medication use is optimised and to improve health outcomes by making therapeutic recommendations and monitoring the patient's response to therapy.[16] In high-income countries there is wide accessibility of patient health record data for all members of the team because of the use of Electronic Health Records (EHR).[13] This is further expanded by the presence of pharmacists on patient wards. However, in LMICs pharmacist access to a patient's health record remains a challenge.[34] Access to health records has been found to allow pharmacists the ability to conduct timely interventions by assessing therapy and increases efficient communication with other healthcare professionals involved with the patient.[38] Limited access to medical record information has a negative impact on patient treatment due to incomplete medical history for many members of the healthcare team.[35,36] The issue of inadequate staffing of pharmacists in hospitals further exacerbates the limits of access to records as they do not have time to visit clinical areas in the hospital where these records are physically kept.

This study assessed the perception of patient record accessibility to pharmacists as perceived by healthcare practitioners. The majority of healthcare professionals believe that pharmacists have access to patients' records. The association between participant perceptions regarding

pharmacist access to patient records and their speciality and hospital was assessed and there was no statistically significant association between different professionals working in different hospitals, likely because the systems are similar across all hospitals in Namibia. It is important to note that pharmacists perceive that they have adequate access to patient records. This study did not investigate the nature of the records the pharmacist is accessing or the method in which they access these records. This study concurs with researchers who argued that it was of importance for hospital pharmacists to have access to medical records and to record their interventions in the patient chart to inform quality healthcare by the healthcare team.[34] Pharmacists who have never had complete access to the medical record (including laboratories and admission notes) may not recognise the limitation they face.

6.2.7 Participant perceptions of clinical pharmacy services by profession

The role of pharmacists has evolved over time and the introduction of clinical pharmacy into pharmacy practice has awakened a new way of practising pharmacy. This new way requires intense collaboration within healthcare teams, even more so than in the past. This study assessed the perception of health professionals, including pharmacists on some of these expanded roles and the perceived relevance of the clinical services in the hospitals. One key issue highlighted was the inadequate number of pharmacists. This has been a common theme of why clinical pharmacy is only slowly growing in many African countries.[9] In this study, pharmacists, especially, are concerned that there are not sufficient numbers of adequately trained pharmacists to ensure adequate interventions by pharmacists. This can be coupled with the fact that the pharmacists in practice are involved in many administrative tasks which take away time from clinical roles. Hospital administrators should consider how these administrative services can be reassigned to other staff in order for the pharmacists to focus on patient-centred roles.

The results indicate overall positive feedback from health professionals regarding the roles they perceive clinical pharmacists could play in ensuring safe medication use and highlight the importance of a clinical pharmacist to patient outcomes. Although the results shows positive feedback, there is still a lot to be done for pharmacists to gain confidence in their own practice and to fully maximise their potential in clinical practice.

6.3 Opportunities for expansion of clinical pharmacy practice

This study assessed the perceptions of participants regarding the significance of clinical pharmacy practice in their facilities. The study found that most respondents agreed that the pharmacist/clinical pharmacist is pivotal in influencing patients' outcomes and that they should be an integral part of the multi-disciplinary team. As indicated by other researchers, the participants indicated a neutral score in the feasibility of active clinical pharmacy services in the current practice setting, citing the necessity for additional training for pharmacists.[3,9] The clinical pharmacy Master's programme at the University of Namibia could serve to provide additional training, but pharmacists themselves will need to advocate for their ability to take on advanced roles.

The respondents indicated that there are inadequate numbers of pharmacists to ensure adequate interventions in the hospitals, a role which is integral to the practice of clinical pharmacy. The study strongly agreed that there is a need for clinical pharmacists to be available for consultations for 24 hours in healthcare facilities. It is unclear if the respondents differentiated significantly between pharmacists broadly and clinical pharmacists in particular. The study further identified that there is a call for pharmacist involvement in antimicrobial stewardship (mean score of 4.08±1.31), averting adverse drug events (mean score 4.02±1.35) and improving patients' outcomes broadly (4.09±1.31).

There are various perceptions amongst various healthcare professionals on the practice of clinical pharmacy. It has been found in earlier studies conducted in the Middle East suggested that physicians were reluctant to collaborate or engage with clinical pharmacists in direct care of patients.[35] However more current studies have found that there has been a shift in practice and healthcare professionals are more prepared to start to collaborate and to support the integration of clinical pharmacy practice in the clinical care team of hospitals.[35,36]

6.4 Limitations

While this study provides new information on the perspectives of health professionals on the implementation and role of pharmacists, there are some limitations. First, not all eligible participants participated in the survey, and some healthcare professionals opted not to respond to the survey citing time and access to the internet as a limitation. Therefore the expected sample size was thus not reached. Additional responses may have provided more precision in the results, but the responses received provide key information. Future studies can employ other methods of motivating for participation amongst healthcare professionals, such as the inclusion of incentives to encourage participation.[22] Additional sampling outside of Windhoek could have expanded the sample size and allowed for the current state of private hospitals to be more broadly known. However, Windhoek is the only large city in Namibia with a population of over 100,000. The other private hospitals in the country are located in smaller cities or towns, where clinical pharmacy services are anticipated to be less advanced. Another limitation is that the tool used was not a previously published and validated instrument. Although the tool was piloted with a small group of health professionals, there may still be some misinterpretations of certain questions, which could present a potential limitation of the study. Future researchers can use this tool in additional settings to validate its usefulness across settings to measure perspectives of clinical pharmacy services

7 CONCLUSION

The primary aim of this study was to assess the pharmacy practice relating to clinical pharmacy in private hospitals in Windhoek by assessing the level of integration of clinical pharmacy practice as part of the multi-disciplinary healthcare team and to compare perspectives across professions. The study found that all health professionals had at least some awareness of clinical pharmacy services in private hospitals, though there were differences between professions. The study further concludes that although there is an awareness of these practices they are not fully implemented as there are areas of care in which pharmacists are not involved. Further, health professionals agreed that additional training is required to equip pharmacists with the necessary skills to render clinical pharmacy services successfully.

In addition the study further assessed the level of acceptance and inclusion of clinical pharmacy practice in to the multi-disciplinary healthcare team in private hospital in Windhoek. It was found that 66% of healthcare practitioners view pharmacists as an integral part of the multi-disciplinary team and that their role adds value to the comprehensive care of patients. However, the study also found that given the current state of hospital pharmacy, changes will be needed to support the proper integration of pharmacists into multi-disciplinary teams to provide prospective advice on therapeutic decisions.

Furthermore, the study aimed to compare the perspectives of clinical pharmacy practice in private health facilities amongst healthcare professionals in Windhoek. The study concludes that there are no significant differences in perspectives amongst healthcare professionals regarding the importance and the need for clinical service provision. The study highlighted that although these services are deemed vital to impact patients outcomes, there is a shortage of pharmacists and adequately trained pharmacists to carry out those services. This data can inform hospital administrators on the perceived need, which, if addressed, will be instrumental to the implementation of clinical pharmacy services in healthcare institutions.

The study further concludes that health professionals believe that there are benefits supporting clinical pharmacist practice implementation in private hospitals in Namibia by leveraging the identified opportunities, including intervening in management of medication therapy of patients, managing medication-related adverse events, managing of antimicrobial usage, and ensuring usage of cost-effective therapy for patients. Hence, multiple opportunities exist for the implementation of clinical pharmacy in healthcare institutions in Namibia to ensure patients receive quality healthcare in private hospitals.

8 RECOMMENDATIONS

While the study indicated that there is a general awareness of clinical pharmacy practices in private hospitals in Windhoek, the following recommendations can be made to ensure the feasibility and successful implementation of clinical pharmacy in healthcare facilities:

1. **Sensitisation and Awareness:**

   Further sensitisation of healthcare facility management and staff regarding the services and impact of clinical pharmacy practice is essential. There is a need for pharmacists to be actively involved in patient care rounds to contribute meaningfully to therapeutic decisions.

2. **Access to Patient Records:**

   It is recommended that healthcare facilities grant pharmacists access to patient records. This access enables pharmacists to provide timely input on therapeutic treatments. Investigating the implementation of Electronic Health Records (EHRs), where possible, will further enhance this timely access.

3. **Training of Clinical Pharmacists:**

   Hospitals should be actively involved in the training of clinical pharmacists. Respondents identified a lack of skills as one of the primary barriers to the implementation of clinical pharmacy practices, making continuous training a crucial factor in overcoming this challenge.

4. **Development of Guidelines for Clinical Practice:**

   The development of comprehensive guidelines for clinical pharmacy practice in Namibia is recommended. These guidelines will serve to guide the implementation of clinical pharmacy services and allow for the measurement of outcomes. Incorporating existing frameworks such as the FIP Basel Statements will help tailor these guidelines

to the specific needs of individual facilities. Regular self-assessments or audits should be conducted to ensure that the standard of practice remains up to date.

5. **Financial Feasibility and Cost-Savings Research:**

   Further research is needed to investigate the financial feasibility of employing clinical pharmacists in hospitals, with a particular focus on the cost savings resulting from pharmacist interventions in Namibia. Understanding the economic impact of clinical pharmacy practice will be essential in advocating for its integration into healthcare facilities.

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10. APPENDICES

Annex 1: UNAM Ethical Clearance Certificate

SCHOOL OF PHARMACY
University of Namibia, Private Bag 13301, Windhoek, Namibia
Florence Nightingale Street, Windhoek North
URL.: http//www.unam.edu.na

UNAM
UNIVERSITY OF NAMIBIA

DECENTRALIZED ETHICS COMMITTEE (DEC)

Tel: +264 (0) 61 206 5055, Mobile: +264 (0) 816018028
Enquiries: Dr. Francis Kalemeera, Email: fkalemeera@unam.na

18 August 2021

TO: Ms. Hendrina Gideon
Student number: 200218208

FROM: Dr. Francis Kalemeera
Chair: School of Pharmacy DEC

DATE: 16-November-2021

SUBJECT: ETHICAL APPROVAL OF RESEARCH STUDY "CLINICAL PHARMACY PRACTICE IN PRIVATE HOSPITALS IN NAMIBIA"

The following matter was discussed at the School of Pharmacy Decentralized Ethics Committee, and the following were recommended.

ETHICAL APPROVAL OF MASTERS IN PHARMACY (CLINICAL PHARMACY).

(1) Reference is made to your application for ethical approval of the above-mentioned study
(2) The proposal and table of corrections have been evaluated and found to have merit.
(3) Kindly be informed that DEC has recommended ethical approval to be granted the University of Namibia Ethics committee to conduct the study.

DEC RESOLUTION: FHSVM/SoP/DEC/11/21/1

DECISION: The School DEC APPROVED research project.

Yours Sincerely,

Dr. Francis Kalemeera

Annex 2: UNAM Research Permission Letter

CENTRE FOR RESEARCH SERVICES
Office of the Pro-Vice Chancellor: Research, Innovation & Development
University of Namibia, Private Bag 13301, Windhoek, Namibia
340 Mandume Ndemufayo Avenue, Pioneers Park, Office F223 - Fblock, Second Floor
☎ +264 61 206 4673; E-mail:kmbulu@unam.na; URL.: http//www.unam.edu.na

UNAM
UNIVERSITY OF NAMIBIA

RESEARCH PERMISSION LETTER

Date: 19/11/2021

Student Name: Hendrina Gideon

Student Number: 200218208

Programme: MASTERS IN PHARMACY (Clinical Pharmacy

Approved Research Title: Clinical Pharmacy Practice in Private Hospitals in Namibia.

TO WHOM IT MAY CONCERN

I hereby confirm that the above mentioned student is registered at the University of Namibia for the programme indicated. The proposed study met all the requirements as stipulated in the University guidelines and has been approved by the relevant committees.

The proposal adheres to ethical principles as per attached Ethical Clearance Certificate. Permission is hereby granted to carry out the research as described in the approved proposal.

Best Regards

Dr. AEE Shikongo
Head: Postgraduate Support Services
Tel: +264 61 206 3129
E-mail: aeshikongo@unam.na

CENTRE FOR RESEARCH SERVICES
Office of the Director
2021 -11- 22
University of Namibia
UNAM

Annex 3: MOHSS Ethics Approval

REPUBLIC OF NAMIBIA

MINISTRY OF HEALTH AND SOCIAL SERVICES

Ministerial Building
Harvey Street
Private Bag 13198, Windhoek

OFFICE OF THE EXECUTIVE DIRECTOR

Tel: No: 061 -203 2507
Fax No: 061-222 558
Andreas.Shipanga@mhss.gov.na

Ref: 22/4/2/3
Enquiries: Ms. C. Narib

Date: 30 May 2023

Ms. Hendrina P. Gideon
PO Box 26747
Windhoek

Dear Ms.Gideon

Re: *Clinical Pharmacy Practice in Private Hospital in Windhoek - Namibia*

1. Reference is made to your application to conduct the above-mentioned study.
2. The proposal has been evaluated and found to have merit.
3. **Kindly be informed that permission to conduct the study has been granted under the following conditions:**
   - 3.1 The data to be collected must only be used for academic purpose;
   - 3.2 No other data should be collected other than the data stated in the proposal;
   - 3.3 Stipulated ethical considerations in the protocol related to the protection of Human Subjects should be observed and adhered to, any violation thereof will lead to termination of the study at any stage;
   - 3.4 A quarterly report to be submitted to the Ministry's Research Unit;
   - 3.5 Preliminary findings to be submitted upon completion of the study;
   - 3.6 Final report to be submitted upon completion of the study;
   - 3.7 Separate permission should be sought from the Ministry for the publication of the findings.
4. All the cost implications that will result from this study will be the responsibility of the applicant and **not** of the MoHSS.

Yours sincerely,

pp 31/5/2023

BEN NANGOMBE
EXECUTIVE DIRECTOR

EXECUTIVE DIRECTOR
MINISTRY OF HEALTH AND SOCIAL SERVICES

All official correspondence must be addressed to the Executive Director.

My NAMIBIA

Annex 3: Questionnaire

Introduction

My name is Hendrina Gideon, and I am a pharmacist at Mediclinic Windhoek Hospital. I am currently studying for a Master of Clinical Pharmacy degree at the University of Namibia. As part of my studies, I am conducting research on clinical pharmacy practice in private hospitals in Windhoek. The study has received clearance from the Ministry of Health and the UNAM Ethics Committee.

The aims of the study are as follows:

To assess current pharmacy practices related to clinical pharmacy in private hospitals.

To investigate the level of acceptance and integration of clinical pharmacy practice into the multidisciplinary healthcare team.

To identify opportunities for the implementation of clinical pharmacy practice in private hospitals in Namibia.

Kindly assist by completing the questionnaire below by 25 August 2023. It will take less than 5 minutes to complete. No names or email addresses will be recorded during this study. The data collected will only be used for the purposes stated in the study.

By continuing with this survey, you are indicating your consent to participate in this research study. If you do not wish to participate, please exit the survey.

Section 1. General Information

Are you a?

a) General Practitioner
b) Specialist/surgeon
c) Nurse

d) Pharmacist

e) None of the above

Which Hospital do you practice at? [select all that apply]

a) Roman Catholic Hospital

b) Mediclinic Windhoek Hospital

c) Lady Pohamba Private Hospital

d) Rhino Park Private Hospital

Section 2. Hospital pharmacy Practice

Does your hospital have clinical pharmacy services? Tick appropriate box

a) Yes

b) No

c) Not sure

If yes, do they manage the following? Tick appropriate box(es)

a) Anticoagulation therapy

b) Antimicrobial therapy

c) Renal dosing of medications

d) Therapeutic drug monitoring

e) Counselling on high-risk medications

Is the Hospital pharmacy/pharmacist responsible for the following? Tick appropriate box(es)

a) Safe Medication use

b) Appropriate medication use

c) Cost-effective medication use

d) Selection of medication related devices

How accessible are the hospital pharmacist(s) as a point of contact for healthcare providers? Tick appropriate box

a) Accessible to all health-care providers at all times

b) Accessible only at certain times of the day

c) Accessible to only certain health-care providers

d) Currently do not serve as a point of contact for health-care providers

Are pharmacist's part of the multidisciplinary team responsible for therapeutic decisions?

a) Yes

b) No

c) Maybe

To what extent are pharmacists actively involved in patient care areas?

a) All care areas

b) Most care areas

c) Some care areas

d) A few care areas

e) No care areas

To what extent are pharmacist actively involved in patient care rounds

a) All patients care rounds

b) Some patient care rounds

c) A few patients care rounds

d) No patient care rounds

Do hospital pharmacists have access to documentations in patient records?

a) Yes

b) No

c) Not sure

If yes, how often do pharmacist s document their interventions in the patient's records?

a) Always

b) Most of the time

c) Sometimes

d) Rarely

e) Never

Does your hospital or institution you work for have a therapeutics committee?

a) Yes

b) No

c) Maybe

Section 3: Clinical Pharmacy

Mark the most appropriate box:

Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1. Is the role of Pharmacists/clinical pharmacist vital to patient's outcome?	1	2	3	4	5
2. Is there an opportunity for active clinical pharmacy in our current practice?	1	2	3	4	5
3. Are clinical pharmacists/pharmacists considered part of the multi-disciplinary team of care?	1	2	3	4	5
4. Do clinical pharmacist/clinical pharmacist make interventions on patient's treatment?	1	2	3	4	5
5. Are you open to clinical pharmacist's recommendations and interventions?	1	2	3	4	5
6. Are there adequate pharmacists to ensure the adequate interventions by pharmacists at your facility?	1	2	3	4	5

7. Do you think there is a need for pharmacists to be further trained in order to carry out clinical pharmacy services?	1	2	3	4	5
8. Should clinical pharmacists be available for consultations 24hours in a hospital?	1	2	3	4	5
9. Do pharmacists/clinical pharmacist play a role in preventing antimicrobial resistance?	1	2	3	4	5
10. Do pharmacists/clinical pharmacists play a role in preventing Adverse Drug events?	1	2	3	4	5