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Research Paper

An analysis of hospital pharmacy practice in Namibia, based on FIP's Basel Statements

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Abstract

Background Sub-Saharan Africa, a region faced with a double challenge of infectious and non-communicable diseases requires strengthening of hospital pharmacy practice to improve treatment outcomes and patient safety.
Objectives The objectives of this study were to assess the current state of pharmacy practice in hospitals in Namibia and to identify opportunities for expanding pharmacists' role in addressing public health challenges and improving medicines use outcomes.
Methods A survey utilized FIP's self-assessment tool to evaluate current hospital pharmacy practice in Namibia against best practices articulated in the Basel Statements. The study was conducted among hospital pharmacists across Namibia. Quantitative and qualitative data were analysed using descriptive statistics and thematic analysis.
Key findings: The study was conducted in 24 hospital pharmacies across Namibia, the majority of which were public facilities (67%). Overall, current hospital pharmacy practice activities are focused on medicine procurement, preparation and distribution. The main barriers to optimal hospital pharmacy services are associated with limited human resources and collaboration across healthcare providers, as well as policy gaps.
Conclusions There is a strong desire among hospital pharmacists to expand their contributions to improving medicines outcomes and solving public health problems. Namibia's pharmacy educational system is a strength and should be utilized to continue advancing hospital pharmacy practice and medicines use. Therapeutics committees are usually part of each hospital's structure and can be very effective for hospital-based policy change. The opportunity exists to optimize pharmacists' contributions by utilizing the local therapeutics committees in combination with the educational system to advance hospital pharmacy practice in Namibia.

Keywords: Namibia; hospital pharmacy; Basel Statements

Introduction

Namibia has a large land mass with a population of 2.5 million people.[1] While classified as an upper-middle-income country, Namibia has high levels of inequity and ranks second on the Gini Index.[2] Poverty rates have declined but are still estimated at 27% in rural areas.[3]

Namibia has adopted a primary health care system to improve care and access to medicines, particularly for the poor. Namibia's public health system is decentralized across 14 regions. Distances to clinics and pharmacies are often long with public hospitals heavily relied upon for primary care. According to the Health Facility Census (2009),[4] Namibia's public sector is the leading provider, with 30 district hospitals, 3 intermediate hospitals and 1 national referral hospital. The country's 13 private hospitals are typically located in urban areas.[5]

Namibia faces a dual challenge of needing to strengthen its national health system and confront a high burden of HIV/AIDS (HIV), tuberculosis (TB) and non-communicable diseases. HIV and hypertension prevalence among adults in Namibia is estimated at 12.6% [6] and 46%, respectively.[7] TB has a prevalence of 465 cases per 100,000 population.[8] Increasing incidence and treatment expenditures for non-communicable diseases, as well as rational use of medicines are concerns.

Hospital pharmacists serve a vital role in Namibia's health system. In-country education of pharmacists has demonstrated impressive progress over the recent decade. In 2009, a Bachelor of Pharmacy degree programme at the University of Namibia was initiated. The first pharmacists graduated from the University of Namibia's School of Pharmacy in 2015. Given the growing cadre of well-educated pharmacists, there is now significant opportunity to advance hospital pharmacy practice as a means of strengthening the country's health system.

The International Pharmaceutical Federation (FIP) Hospital Pharmacy Section (HPS) provides a framework for advancing hospital pharmacy practice through the Basel Statements on the Future of Hospital Pharmacy. The Basel Statements were developed by FIP's HPS in 2008 with consensus input from 98 countries and were updated in 2014.[9] HPS's goal is to advance hospital pharmacy practice across seven domains: overall governance, influences on prescribing, monitoring of medicines use, procurement, preparation and delivery, administration and human resources training and development.[10]

For many countries and hospitals, the Basel Statements are aspirational. Recognizing that hospitals, pharmacy educators, leaders and public health officials globally need guidance, an FIP working group designed a hospital pharmacy self-assessment tool in 2013.[11] The tool was piloted in Kenya, then updated and subsequently validated in six Sub-Saharan African countries.[12]

The assessment mechanism prioritizes hospital pharmacy practices across three tiers, as given in Table 1. Tier 1 focuses on procurement, preparation, distribution and administration. Tier 2 focuses on appropriate use of medicines and is more clinically oriented. Tier 3 pertains to advanced clinical practice, routinely serving most patients and integrating advanced technologies.

Namibia was selected for this research based on progress in pharmacist education and potential for continued advancement. The purpose of this study was to assess the current state of pharmacy practice and to identify opportunities for expanding pharmacists' role in addressing public health challenges and improving medicines use outcomes.

Table 1 Basel Statements tier structure

Tier	Description
1	Good Hospital Pharmacy Practices which support the safety of procurement, preparation, distribution and administration no matter the available resources
2	The start of clinical service activities which address appropriate use but do not serve every patient, due to available resources
3	Best practices, robust clinical services and integrated information technology systems in place to serve every patient

Methods

Study design and setting

A survey of hospital pharmacy practice was conducted during July 2018 across Namibia. The design utilized the Basel Statements self-assessment tool, in combination with qualitative interviews. The study was approved by Namibia's Ministry of Health and Social Services. Individual respondents consented to participate and were assured that their responses would be treated with complete confidence and avoidance of social harm.

Study population

A convenience sample of pharmacists representing 24 hospitals was utilized, covering approximately 50% of all hospitals in Namibia, with at least one from each region. The sample was based upon stratification by region and then by public or private sector, and thereafter convenient selection by affiliation to the School of Pharmacy University of Namibia, as placement sites. Included were 16 public and 8 private hospitals. District, regional and national hospitals were included in the public sector sample. Typically, the hospital's head pharmacist was interviewed and completed the self-assessment unless she/he was unavailable and delegated a colleague.

Procedure and analysis

The self-assessment tool evaluated hospital pharmacy practice across the respondents. A qualitative interview guide was developed for use with the self-assessment. This explored the pharmacists' daily activities, time spent in inpatient and outpatient care, clinical activities, medication safety practices and supply chain/information management. Pharmacists were also interviewed regarding perceived strengths and weaknesses of current services, and challenges faced.

The data collection was conducted via in-person site visits by three graduate level pharmacy students who were working with the investigators. The interviews were recorded and subsequently transcribed. If the respondents lacked time for both the interview and survey during the scheduled visit, then phone or email completion was utilized.

Quantitative data were double entered in EpiData Entry 3.1 for management and quality assurance and exported to Excel for analysis. Face validation for errors was completed by the research team. Means and descriptive statistics were determined for all hospitals, as well as the public and private hospital subgroups. The qualitative data were analysed through familiarization with the transcripts, then thematic coding and charting of the findings, using Tesch's method. Individualized reports with comparator group data and customized recommendations were provided to each hospital.

Results

Demographic profiles

A description of the participating hospitals is given in Table 2. Most had inpatient bed capacity of less than 200, with only four public hospitals having > 300 beds. The number of pharmacists per 100 beds was substantially lower in public hospitals (average 0.8) compared with private hospitals (average 4.1). The number of pharmacy assistants per 100 beds was also lower with an average of 1.2 in public compared to 2.2 in private hospitals.

Table 2 Respondent demographics

	Hospital type		
	Public	Private	All hospitals
Number of hospitals	16 (66.7%)	8 (33.3%)	24
Mean number of beds	250	79	218
Bed capacity			
0–100 beds	4 (25.0%)	5 (62.5%)	9 (37.5)
101–200 beds	5 (31.2%)	3 (37.5%)	8 (33.3)
201–300 beds	3 (18.8%)	-	3 (12.5)
>300 beds	4 (25.0%)	-	4 (16.7)
Pharmacists/100 beds	0.8 (range 0–2.3)	4.1 (range 2.3–10)	2.1
Pharmacy assistants/100 beds	1.2 (range 0–6.8)	2.2 (range 0–6.7)	2.2

Self-assessment tool results: achievement of Basel Statements

A discussion of all 65 Basel Statements is beyond the scope of this paper. Therefore, results reported are selected to highlight areas of strength and opportunities for improvement. Areas of strength were determined by the authors for Basel Statements in which more than 75% of respondents reported that the practices were in place, as well as independent review and consensus among the researchers. Opportunities for improvement were statements where a practice was present in less than 50% of all hospitals or either the public or private sector category.

Table 3 displays areas of strength identified through the self-assessment. Many of these are Tier 1 statements, with fewer in Tiers 2 and 3. The Tier 1 statements focus on safety and storage, with most respondents reporting that these practices are in place. For Tier 3 statements, the first relates to hospital pharmacist accessibility, with 96% of all respondents indicating availability at all times. All hospitals reported that pharmacists are able to review medicine orders before dispensing and administration – a key Tier 1 activity.

Another strength is that many hospitals reported having a Therapeutics Committee to establish a formulary and address medicines use policies. Almost all hospitals have pharmacists serving on these committees. Also, most respondents reported having references available to support safe dispensing and administration of medicines. Finally, a positive finding was that almost all hospitals had processes in place for reporting defective medicines, medication errors, and adverse events.

Table 4 lists opportunities for improvement as identified through the self-assessment. Regarding research on new methods and systems to improve use of medicines, the response levels were low at 21% overall. The results regarding hospital pharmacists' monitoring of all patients' medications for safety, appropriate use and optimal outcomes is concerning. At an overall average of 17%, hospital pharmacists are not able to regularly assure medicines safety and appropriateness. Similarly, scores relating to pharmacists' participating with multidisciplinary teams or providing services under collaborative practice agreements were low. Scores in this area were higher for private than public hospitals.

For preparation and delivery of medicines, scores were low for the use of technologies such as bar coding or automated dispensing. Just 30% (19% in public and 57% in private hospitals) reported pharmacists' involvement in managing the preparation and administration of hazardous drugs, including chemotherapy. Finally, respondents had low scores regarding the ability to benchmark best practices or obtain external accreditation.

Qualitative findings

Pharmacists' qualitative responses aligned with current practices being focused on medication procurement, preparation, distribution and administration. As given in Table 5, respondents in both public and private hospitals estimated spending 74% or more of their time on medicine dispensing and stock management. They reported spending just 2% of their time on clinical programmes such as antimicrobial stewardship.

This respondent quote conveys the dilemma:

"We're trained to do so much more than move boxes and count pills, but that stuff still must get done at the end of the day and you're the one it falls on. I'd love to use the clinical side of my degree more, but in practice I sadly can't seem to find the time." - Head Pharmacist, UNAM B-Pharm Graduate

As given in Table 5, public hospital pharmacists report spending up to 78% of their time providing outpatient care. In contrast, the private hospital pharmacists reported spending nearly 80% of their time on inpatient activities.

The qualitative findings indicated how outpatient volumes present considerable demand on the pharmacists' time, as captured here:

"I can't be in two places at once. If I do inpatient rounds to help twenty patients for two hours, there would be hundreds of people waiting here in outpatient who would just leave. I can't leave outpatient since I need to be where the most people need me." - Head Pharmacist, District Hospital

The weaknesses most frequently reported are listed in Table 6. Staffing shortages were reported far more frequently as a weakness by public hospital respondents. Those pharmacists reported interaction with other providers, policy issues, facility and environmental concerns, and access to clinical/medical information as weaknesses considerably more than their private sector counterparts. Limited clinical involvement was raised as a concern by both public and private hospital pharmacists.

Discussion

Namibia's hospital pharmacy practice currently centres on Tier 1 activities of procurement, preparation and distribution of medicines, but there is clear interest and opportunity for advancement. Our results indicate that integrating pharmacists into Tier 2 and 3 practices is a consistent gap at many hospitals. Through strategies supporting pharmacists' increased contribution to clinical care, hospitals can advance pharmacists involvement and improve medicines use outcomes.

Three study limitations are noted. First, not all pharmacy practices included in the self-assessment tool are broadly applicable. Secondly, not all of the tool's terminology is universal to pharmacy practice globally so could be misinterpreted. The tool's application was strengthened by using a qualitative method that reflected respondents' input on unique conditions of the healthcare system, sector (public vs. private) and individual hospitals. Another limitation was that not all respondents participated in the qualitative interview or answered all of the questions.

The study results are consistent with an analysis in six other countries in sub-Saharan Africa, which showed an achievement of a majority of Tier 1 activities yet identified many areas for growth.[13]

Table 3 Key areas of strength

Basel Statement domains	Statement	Practice tier	All %	Public %	Private %
Overarching Statements and Governance	Hospital pharmacists accessible as a point of contact (examples: on call, phone, in person) to all health care providers at all times	T3	96	94	100
	Ensuring proper storage to maintain quality, safety, and security of medicines across supply chain	T1	100	100	100
	Review, interpretation and validation of all prescriptions before dispensing or administration	T1	100	100	100
Procurement of Medicine	Hospital has formulary system	T1	78	94	43
Influences on Prescribing	Formulary system based on best available evidence	T3	85	94	50
	Pharmacists serving on hospital Pharmacy and Therapeutics Committee	T2	96	100	86
	Educating prescribers on access to and evidence for optimal and appropriate use of medicines	T2	91	94	86
Preparation and Delivery of Medicines	Labelling of medicines	T1	100	100	100
	Storage, preparation, dispensing and distribution of all medicines, including investigational medicines	T1	96	94	100
	Determining which medicines are included in ward stock	T1	91	100	71
	Appropriate and current information resources to ensure safe preparation and administration	T1	87	88	86
	Ensuring patient's medication allergies, drug interactions, contraindications and past adverse events accurately recorded and evaluated before medicine administration	T1	87	88	86
	Packaging of medicines	T1	96	94	100
	Labelling individual patient medicines with at least two patient identifiers	T1	78	75	88
Monitoring of Medicines Use	Utilizes reporting system for adverse reactions	T2	100	100	100
	Utilizes reporting system for medication errors	T2	79	75	88
	Utilizes reporting system for defective medicine	T1	92	94	88

Table 4 Opportunities for improvement

Category	Statement	Practice tier	All %	Public %	Private %
Overarching Statements and Governance	Majority of hospital pharmacists engage in research or auditing involving new methods and systems to improve use of medicines	T3	21	19	25
	Hospital pharmacists continually monitor all patients' medications for safety, appropriate use and optimal outcomes on daily basis	T3	17	19	13
Influences on Prescribing	Pharmacists actively involved on multidisciplinary teams within patient care areas or wards	T3	38	25	63
	All or most pharmacists trained to participate in collaborative prescribing	T3	33	38	25
Preparation and Delivery of Medicines	Bar coding system at administration	T3	17	6	43
	Automated prescription filling	T3	13	19	0
	Pharmacists manage preparation of hazardous medicines, including cytotoxics	T2	30	19	57
Administration	Policies and strategies to prevent wrong route errors	T2	43	38	57
Monitoring of Medicines Use	Review of hospital medication practices by external quality assessment accreditation programme	T3	57	63	43
	Data collected and trended against internal benchmarks and/or best practices in other institutions	T3	30	25	43

Differing scores for public versus private hospitals reflect several factors. In public hospitals with a large outpatient demand, pharmacists are challenged to complete dispensing and stock management along with providing clinical services. The low number of pharmacists per 100 beds and the substantial outpatient pharmacy responsibilities explains why many Tier 3 activities are not provided. In public hospitals, staffing and procurement are driven at the ministry and central medical store level. Private hospital pharmacies are often owned by the pharmacist, not the hospital. Ownership along with technology availability, staff to beds ratios and outpatient demand significantly impact pharmacy practice. In both settings, stock management and dispensing dominate pharmacists' time. Pharmacy departments lack the funding to enable more time for clinical care. This research confirms the findings by Law *et al.*[14] that resource availability impacts achievement of hospital pharmacy practices in sub-Saharan Africa.

Table 5 Respondent estimates of % time by activity

Activity	Average % of time Activity type			Range % of time Activity type	
	All	Public	Private	Public	Private
Dispensing	55	54	55	0–77	15–80
Stock management	19	18	20	0–50	10–85
Business planning/Office work	10	11	8	0–40	0–15
Interdisciplinary interaction/Wards	9	11	5	5–30	0–10
Dedicated staff training time	3	5	0	0–20	0
Clinical programmes	2	0	3	0	0–10
Estimated time spent on inpatient services	42	22	80	0–40	10–100
Estimated time spent on outpatient services	58	78	21	60–100	0–90

Table 6 Self-reported weaknesses

Self-reported weakness	Total (*N* = 24)	Public (*N* = 16)	Private (*N* = 8)
Human resource issues (Understaffing)	18 (75%)	14 (87.5%)	4 (50%)
Medication access (Stock Outs/Importing)	13 (54.2%)	9 (56.3%)	4 (50%)
Limited clinical involvement	11 (45.8%)	7 (43.8)	4 (50%)
Healthcare provider interaction	10 (41.7%)	9 (56.3%)	1 (12.5%)
Policy (lack of autonomy/Bureaucracy/Laws)	9 (37.5%)	9 (56.3%)	0 (0%)
Pharmacy space and environmental concerns	9 (37.5%)	9 (56.3%)	0 (0%)
Access to Clinical/Medical information	7 (29.2%)	6 (37.5%)	1 (12.5%)

Advancement will require prioritization and practicality. The goal is to help Namibia's hospital pharmacists systematically advance towards Tier 2 and 3 activities. The University of Namibia's School of Pharmacy has demonstrated significant success in training pharmacists and improving practice education. Our qualitative findings confirmed that Namibia's pharmacists desire to be more fully integrated in care delivery. This integration can be achieved through the Basel Statements framework and strategies for higher tier practices.

We propose a route to navigate resource constraints and develop strategies at local hospital levels. Efforts should be made to source and utilize efficiency tools including the expansion of existing technology used for Tier 1 services such as the Facility Electronic Stock Management Tool (FESC) and the electronic dispensing tools used for HIV and TB care (EDT, ETR and eTB manager, among others) for Tier 3 services. Expanding the use of pharmacy technicians will allow pharmacists to allocate more time to utilizing their clinical expertise in improving medicines safety and patient outcomes. There is need to further use an integrated demographic health Information system (DHMIS-2) supported by the U.S. President's Emergency Plan for AIDS Relief (PEPFAR) to overcome monumental challenges and costs associated with implementation of technological solutions.

Namibia's hospital pharmacists can help improve health outcomes (while also managing costs) in non-communicable diseases. For example, the country's decentralized management of hypertension can be enhanced by increasing pharmacists' involvement in patient education and medicines management.

At a centralized level, Namibia's National Strategic Framework for HIV and AIDS Response [15] also presents an opportunity. High HIV/TB coinfection rates along with opportunistic infections require complex regimens and antimicrobial stewardship. Aligning pharmacy best practices with national priorities such as HIV and TB can improve both health and economic outcomes. For example, in HIV management the WHO has described second and third-line regimens as being 3 times and 18 times more expensive than first-line drugs.[16] FIP has identified antimicrobial stewardship as a global priority and an FIP Commission on Antimicrobial Resistance (AMR) seeks to facilitate pharmacists' contribution to AMR action plans including surveillance of antimicrobial use and resistance, as well as antibiotics distribution and regulation.[17]

Therapeutics committees are an excellent venue for initiating change. These exist in most Namibian hospitals and pharmacists generally serve in leadership roles. They are well-positioned to work closely with the committee physicians, establish priorities and propose policies for advancing hospital pharmacy. Resultant policies should be better accepted having been developed internally to address the hospital's particular interests and strengths. Therapeutics committees are used widely in Africa, so this model is applicable beyond Namibia. Strong evidence from other continents supports this approach in shared priorities such as antimicrobial stewardship, drug shortages and public health emergencies such as COVID-19.

As individual hospitals achieve pharmacy services improvements, best practices should be shared through interprofessional platforms. These could be regional, facilitated forums to advance the agenda for hospital pharmacists within broader hospital and healthcare systems. Stakeholders should use best practice experiences to engage the Ministry of Health and Social Services in further integrating pharmacists into clinical care and utilizing their capabilities to improve national health outcomes.

Conclusion

This research demonstrated that Namibia's hospital pharmacists currently focus on medicine procurement, preparation and distribution out of necessity, particularly in public hospitals. Shifting to clinically focused activities is challenging due to high patient volumes alongside limited staffing and technology. Namibia's hospital pharmacists provide both outpatient and inpatient services yet seek to utilize more of their clinical expertise. This research highlighted how the Basel Statements and self-assessment tool can identify opportunities for motivating practitioner interest and building hospital pharmacy capabilities. It also demonstrates the importance of customizing a global instrument to unique country and health system conditions.

The Basel Statements provide guidance for aligning pharmacy practice efforts with national health initiatives. Namibia's hospital pharmacists will continue to face demands such as high outpatient volumes but can utilize the Basel Statements to effect local change. Therapeutics committees are an optimal venue to address medicines use policies, develop strategies to integrate pharmacists in clinical care, and track the results. Follow up assessment of practice compared to the Basel Statements can be continued using the online self-assessment survey.[18] Achievements in advancing hospital pharmacy practice at individual Namibian hospitals can be shared regionally and with the MOHSS to generate momentum and support.

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Author Contributions

All authors state that they had complete access to the study data that support the publication. A.B.: Project design, research supervision, data analysis and manuscript writing and corresponding author. M.I.: Project design, data review, manuscript writing D.K.: Project design, research supervision, data analysis and manuscript writing. J.S.: Project design, research supervision, data analysis and manuscript writing.

Ethical Approval

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Conflict of Interest

All authors whose names are listed certify that they have no affiliation with or involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this manuscript.

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