


Improving the provision of clinical pharmacy services in low- and middle-income countries: a qualitative study in tertiary health facilities in Tanzania

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ABSTRACT

Background The provision of clinical pharmacy services (CPS) in low- and middle-income countries is still low. The reported challenges in providing CPS include healthcare structures, public policies, resources, workforce, culture and education inequalities. This study aimed to explore the strategies to improve the provision of CPS in tertiary health facilities in Tanzania.

Methods This study was conducted between August and September 2021. We adopted an exploratory qualitative study to conduct 14 in-depth interviews with hospital administrators and 10 focus group discussions (FGDs) with healthcare providers. A purposeful sampling technique was used to recruit 97 participants, including 45 pharmacists, 31 medical doctors and 21 nurses across five tertiary healthcare institutions. Of those, 14 hospital administrators participated in 14 IDIs and 83 healthcare workers divided into 10 FGDs. Analysis was done using a qualitative thematic approach.

Results The study identified several strategies that fall under four major themes: (i) strengthen preservice training by reviewing the Bachelor of Pharmacy training curriculum to include clinical pharmacy components; (ii) improve continuing professional training through regular provision of on-job training to pharmacists; (iii) revise the scope of work for pharmacists to include CPS provision in the job description; and (iv) improve operational environment by ensuring availability of guidelines, policies, and adequate number of pharmacists and good inter-professional communication skills.

Conclusions This study's findings highlight that improving CPS provision requires strengthening pharmacists' training, scope of work and operational environment. The latter calls for multifaceted engagement from pharmacists, training institutions, policymakers, regulatory bodies and health systems for sustainable progress.

WHAT IS ALREADY KNOWN ON THIS TOPIC

⇒ Clinical pharmacy service (CPS) is essential in ensuring medication optimisation for patients; however, the provision of CPS in low- and middle-income countries (LMICs) like Tanzania is still low.

WHAT THIS STUDY ADDS

⇒ This study represents one of the few qualitative studies exploring strategies to improve CPS provision in tertiary healthcare facilities in LMICs. We found out that strengthening preservice training, developing guidelines and policies for CPS provision, improving continuous health professionals training and reviewing the scope of work for pharmacists to include CPS in their job description may significantly improve the provision of CPS.

HOW THIS STUDY MIGHT AFFECT RESEARCH, PRACTICE OR POLICY

⇒ The findings reflect the need to employ multifaceted efforts from policymakers, training institutions, and health systems to facilitate the implementation of CPS in LMICs.

BACKGROUND

Clinical pharmacy services (CPS) is a component of pharmaceutical care that intends to optimise medication therapy, prevent the occurrence of diseases and promote patient health and well-being.¹ Following the adoption of the pharmaceutical care philosophy as the primary mission of the pharmacy profession, pharmacists presently provide CPS, which constitutes direct patient care.² The latter necessitates an expansion of the roles of pharmacists beyond the traditional routine of medication ordering, stocking, dispensing and medication reconciliation to include

direct patient-oriented activities such as participating in ward-rounds alongside other healthcare professionals, conducting pharmacists-only ward-rounds, attending clinics, prescribing and providing follow-up and counselling to patients.³⁻⁵

The provision of CPS can result in various benefits, including reduced adverse drug reactions, treatment costs, physician workload and patient admission days.⁶ In Ireland, it was found that adequate implementation of CPS prevented the occurrence of adverse drug events, which saved the cost of about TZS 1.89 billion (€710 000), with substantial net cost benefits of €626 279 (TZS 1.67 billion) annually.⁷ Moreover, working together in a multidisciplinary team of healthcare providers (HCPs) ensures appropriate management of patients and brings about patient satisfaction.⁸ Including clinical pharmacists in daily ward rounds could also reduce medication-related problems and patient harm.⁹ Additionally, CPS provides an opportunity for other HCPs to learn more about pharmacological treatment while fostering relationships and trust.¹⁰

Several strategies have been reported to facilitate the effective provision of CPS. These include the availability of necessary support materials for CPS with one's resources, the availability of pharmacists who will implement the CPS following the clinical profile, training pharmacy staff to perform logistic activities, use of the strategic plan and adapting the CPS according to the workplace and patients' health needs.¹¹⁻¹³ Previous studies have reported superior CPS provision in high-income countries. For instance, China has successfully (>84%) established a clinical pharmacist system, clinical pharmacist management rules, clinical pharmacist's working ethics and applied clinical rational drug use software in tertiary hospitals.^{14 15} Such initiatives have contributed to the improvement of CPS provision in China. Moreover, some countries implement the reimbursement CPS whereby a general practitioner refers a patient to a clinical pharmacist for medication review service.¹⁶ In these countries, the consultation of clinical pharmacists fosters the effective implementation of CPS and supports the rationalisation and optimisation of medications for individual patients.¹⁷

In low- and middle-income countries (LMICs), including Tanzania, the implementation of CPS is still deficient. Several challenges hinder the effectiveness of CPS in these countries, including a shortage of pharmacists, lack of support from co-workers, inequalities in the healthcare structures, limited competencies due to lack of on-the-job training and inadequate clinical practice during undergraduate training.¹⁸⁻²⁰ Despite these challenges, evidence from countries with successful CPS indicates that, with the changes in legislation and accreditation, the adoption of CPS implementation in healthcare facilities is feasible.²¹ In Tanzania, the pharmacy practice regulation (2020) was recently amended by the Ministry of Health through the Pharmacy Council, which includes CPS as one of the fundamental responsibilities of

pharmacists working in hospitals.²² Despite these efforts, the provision of CPS remains low, which has necessitated the conduct of this research. This study aimed to explore the strategies for improving the provision of CPS in Tanzanian tertiary hospitals, focusing on zonal referral hospitals and a national hospital as a case study. It is crucial to examine the perspectives of hospital administrators and HCPs to enlighten opinions for improvement and sustainability of service provision in limited-resource settings.

METHODS

Research design

In 2021, a qualitative study design using in-depth interviews (IDIs) and focus group discussions (FGDs) was employed to explore the strategies to improve the provision of CPS in Tanzania. We selected a qualitative study design to ensure provision of detailed descriptions and a comprehensive overview of the strategies that may enhance the provision of CPS in hospital settings. We developed the interview and FGD guides to elicit views from the respondents.

Study context

This study was conducted on Tanzania's mainland, comprising seven geographical zones and 26 administrative regions. The study area was stratified into five zones of Tanzania's mainland. This included Eastern, Central, Northern, Southern Highlands and Lake zones. In Tanzania, the healthcare system operates in a pyramid of three levels of healthcare service providers: primary, secondary and tertiary. The primary level comprises dispensaries, health centres and district hospitals.

In contrast, the secondary-level comprises regional referral hospitals; the tertiary level contains the national, zonal, and specialised hospitals. Therefore, this study included four zonal referral hospitals (two of four were faith-based) and one national hospital. These hospitals were selected assuming they have adequate pharmacists to execute CPS because the workload indicator for staffing needs is based on the health workers' workload.²³

Study population and recruitment

We used purposive sampling to recruit 97 study participants for IDIs and FGDs based on their professional education level, position, expertise and experience. Of those, 14 were hospital administrators who participated in IDIs, and 83 were HCPs (nurses, doctors and pharmacists) who participated in FGDs. Purposive sampling allows researchers to obtain participants who can provide rich and relevant information for the study topic. The recruitment criteria for hospital administrators were either being an executive director, the director of clinical or medical services, or the head of the pharmacy department and their interaction with HCPs and patients. We recruited non-pharmaceutical HCPs (nurses and doctors) who actively provided direct care and treatment to patients in wards or outpatient clinics. The pharmacists

were chosen based on their education level and bachelor's degree or above. In each hospital, researchers contacted the person in charge of the department/unit and requested a list of individuals working in the respective unit. The researchers identified study participants based on their suitability and willingness to participate. Recruitment of participants was stopped when saturation was achieved (ie. no new information was obtained from participants and redundancy was achieved).²⁴

Patient and public involvement

Patients and the public were not directly involved in this study.

Ethical approval and consent to participate

The approval to conduct this study was obtained from the Muhimbili University of Health and Allied Sciences Ethical Review Board (MUHAS-REC-05-2022-1132). We obtained permission from the executive directors of the respective hospitals to conduct the study. Written informed consent was obtained from each participant after receiving explanations about the research objectives and the use of an audio recorder. Focus group participants were asked to keep all comments made during the focus group confidential and not to discuss what happened during the focus group outside the session. We reminded participants that participation was voluntary, and thus, they could freely withdraw from the study when necessary.

Data collection procedures

Data collection was conducted between August and September 2021. We developed semistructured guides in English and then translated them to Kiswahili for conducting the FGDs and IDIs (see online supplemental file 1). Both guides were developed based on the objectives, researchers' experience and adequate literature review.^{4 13 19} The guides were revised in response to emergent issues as we moved on with interviews. The guides consisted of open-ended questions and probes designed to elicit information regarding ways/strategies for improving CPS provision in the respective hospitals. Data collection was conducted by four researchers with experience in qualitative data collection (DLM, MK, RFM, HJM) and four research assistants (RAs). The team comprised a midwife specialist, a qualitative researcher and pharmacists with specialisations in clinical pharmacy, pharmacology and therapeutics. RAs received a training on the study objectives, guides, informed consent and research procedures before the start of data collection. Each participant provided written informed consent before taking part in the interview or FGD after being briefed about the study's objectives and the fact that the session would be audio-recorded.

We conducted 14 IDIs with the selected participants: four executive directors, five directors of hospital medical services and five heads of the pharmacy departments (pharmacist-in-charge of the hospital). Additionally, 10

FGDs were conducted, five of which involved pharmacists only, and the other five involved nurses and doctors. The focus groups of pharmacists and other HCPs were conducted independently. Each group consisted of 6 to 12 participants. The hospital administrators were visited in their offices within the hospital for the interviews based on the prior set appointment. At the HCPs' convenience, FGDs were conducted in a private and quiet room designated for this purpose at the health facility. Each interview and FGD was conducted by two people, a researcher who moderated the interview and a research assistant who took notes and audio recorded the session. FGDs and IDIs lasted between 60 to 120 and 30 to 60 min, respectively.

Data management and analysis

The audio-recorded interviews and discussions were first transcribed verbatim. Before the analysis, transcripts and field notes were given to six researchers (DLM, RFM, HJM, WPM, MK, WAK) for them to read and re-read to become familiar with data and context, as well as to gain a general understanding of the participants' accounts. The data analysis team included members with various health and social sciences backgrounds. These were a midwife qualitative researcher, sociologist and public relations expert, while the rest were pharmacists with specialisations in clinical pharmacy, pharmacology and therapeutics. We used a hybrid thematic data analysis approach that utilises inductive and deductive reasoning.²⁵ The codebook with initial codes was developed deductively from existing theories^{26 27} and concepts from literature and inductively from emergent ideas noted during familiarisation with data. Subsequently, the data were managed and organised using Dedoose software. The open coding was done in pairs to ensure inter-coder reliability and facilitate the resolution of discrepancies and disagreements through discussion. The agreements were reached with the team. The codebook was updated with new emergent codes as the analysis progressed. The identified codes were then examined for commonalities and differences and put into subthemes. Subthemes were collated, and themes were identified from the repeated patterns across the data set. Themes were refined and finalised by reviewing and discussing with the entire team of researchers. Lastly, the generated subthemes and themes were presented with quotes describing each theme's meaning.

Trustworthiness of the study

In a qualitative study, four criteria are used to assess if the findings are worth believing. These include credibility, dependability, confirmability and transferability.²⁸ The credibility of this study's findings was enhanced through the triangulation of participants with experiences and member checks. The triangulation of data collection methods (IDIs and FGDs), study settings (five different settings) and researchers was done to enhance the credibility and dependability of the study findings.

Themes were generated inductively and presented with the support of subthemes and quotes to ensure that the findings reflect the participant's accounts rather than the researcher's understanding of the phenomenon.²⁹ A thick description of the study context, study participants, sampling technique, data collection methods and the analysis process has been provided to enhance the transferability of the findings to other similar contexts.³⁰

RESULTS

The overall sample consisted of 97 participants, of whom 14 were hospital administrators who took part in interviews and 83 were HCPs who participated in the FGDs. Of the 14 hospital administrators, five were executive directors of the hospitals, five were directors of medical services, and five were heads of pharmacy departments/units. Their education ranged from bachelor's degree to PhD, and 12 out of 14 (85.7%) had more than 3 years of experience in their leadership position.

Slightly more than half (54.6%) of the 83 HCPs were males aged between 25 and 68. Out of 83, 61 had a bachelor's degree, and 13 had masters level education in medical or clinical pharmacy (five vs eight, respectively). Of the 83, 47 had more than 5 years of work experience.

Participants proposed several strategies to improve provision of CPS in health facilities. These include strengthening the preservice training curriculum, improving continuing health professionals' development, revising the scope of work for pharmacists and improving the operational environment to foster the willingness of pharmacists to collaborate with other HCPs in the clinical care of patients (see [table 1](#)).

Strengthen pre-service training

We found out that to enhance the provision of CPS in hospitals, the Bachelor of Pharmacy Degree Program curriculum must include and prioritise the component of clinical pharmacy. Furthermore, pharmacists and non-pharmacist participants emphasised that the training should expose students to clinical rotations and guide them in interacting with patients during ward rounds and clinic visits effectively. In addition, participants who were not pharmacists maintained that clinical rotations for pharmacy students ought to build their capacity for teamwork, which will also improve their inter-professional communication skills and collaborations. Participants said:

....Similar to nursing and medical students, their (pharmacy) training should be tailored to include direct contact with patient ... the curriculum should be revised to reflect CPS and the practical areas that students will be taught. FGD1-Participant6

Participants proposed using a competency-based curriculum to foster the acquisition of adequate skills in providing CPS. They added that this would give insight into their expectations regarding hospital work, including collaboration with other HCPs in which each provider has a clear role. Participants also recommended that higher education institutions increase the number of pharmacy students and train them using competency-based curricula to invest in a substantial number of pharmacists with CPS competencies.

Our university curriculum must be revised to focus on relevant competencies so that students are trained to have an adequate understanding of CPS and how to work in a team with other HCPs... They must know that in the clinical care of the patient, the ward

Table 1 Description of themes and subthemes

Themes	Subthemes
Strengthen preservice training	<ul style="list-style-type: none">► Inclusion of clinical pharmacy services in the curriculum► Use of competence-based curriculum for pharmacy students► Increase time for clinical rotations in the undergraduate training► Improve interprofessional communication► Increase enrolment of pharmacy students in higher learning institutions
Improve continuing health professionals' training	<ul style="list-style-type: none">► Provide on-the-job training to strengthen skills► Develop curricula for short courses► Provide mentorship and supportive supervision► Provide coaching► Promote teamwork in a clinical setting
Revision of scope of work for pharmacists	<ul style="list-style-type: none">► Include provision of CPS in the job description of pharmacists► Revise the scheme of service for pharmacists► Promote skill mix activities for pharmacists
Improve operational environment	<ul style="list-style-type: none">► Raise awareness among other HCPs on CPS Review policies, guidelines and standard operating procedures (SoPs) to accommodate CPS► Strengthen dispensing services► Provide incentives to HCPs at the front line as part of motivation► Employ an adequate number of pharmacists
CPS, clinical pharmacy services; HCPs, healthcare providers.	

rounds consist of several HCPs, and the role of each one should be known. IDI-participant4

Some participants had a misperception about the qualifications needed for clinical pharmacy. One participant believed that a pharmacist providing CPS required simply studying pharmacology and recommended incorporating this into the training curricula. However, this subject is taught in all pharmacy colleges; therefore, in addition to pharmacology, clinical pharmacy services require knowledge of pharmacotherapeutics and some medical subjects. A participant said:

In your curriculum, ensure that second-year students have a strong foundation in pharmacology, so they are well-prepared to spend time on the wards during their fourth year, even if it's just for a few days each week. FGD2-Participant3

Improve continuing health professionals training

Participants reported that the clinical skills of in-service pharmacists must be improved to provide CPS in hospital settings effectively. They suggested that the curriculum for a short CPS course be developed and offered clinical-oriented refresher courses or on-the-job training to increase their exposure to what to do during ward rounds and clinics with other HCPs. Participants said:

The major issue is building their capacity, which is important because it is a new practice. Building their capacity may facilitate their work ethics and enable them to stop the normal tradition of working only on dispensing medications. FGD3-Participant6

Furthermore, participants in this study hypothesised that regular supportive supervision could effectively influence the excellent practice of CPS provision. They reported that technical and professional guidance is crucial for pharmacists to provide the highest quality direct patient care. They remarked that coaching, mentoring and supportive supervision by trained and skilled providers could allow pharmacists to acquire the confidence, knowledge and skills necessary to provide CPS and demonstrate the most effective teamwork practices in the clinical setting. One participant explained that:

On my side, I suggest that pharmacists have mentorship and supervision from those who have skills or have received CPS training. They will transform the available hospital pharmacists to gain more confidence and their abilities to provide CPS. FGD5-Participant5

REVISION OF SCOPE OF WORK FOR PHARMACISTS

Participants stated that the job descriptions and the scheme of service for pharmacists should be revised to include CPS provision as a core responsibility to promote pharmacists' participation in direct clinical patient care. They further recommend that the hospital's head of pharmacy establishes strategies and schedules to facilitate pharmacists' attendance at ward rounds and clinics alongside other HCPs. Participants said:

The Pharmacy Council of Tanzania should look upon enforcing the provision of CPS by making sure that clinical pharmacists are part and parcel of the team managing patients apart from dispensing medications. IDI-participant2

...The hospitals' administration must prepare clear schedules that indicate pharmacists to take part in managing patients and not just staying in the dispensing rooms. IDI-participant5

Additionally, one hospital administrator admitted that CPS should be implemented in each hospital, regardless of the number of pharmacists. Participants proposed implementing skill mix activities to encourage pharmacists' participation in clinical activities. The administrator added that the provision of CPS could be facilitated through intern pharmacists to foster the widespread adoption of this practice among all pharmacists.

I have had several conversations with the head of the department that this should start by using the few pharmacists we have, or we can start this with interns first and then later it will become our culture here. IDI-participant3

Improve operational environment

The Participants underscored the necessity for improved CPS provision in Tanzania. They said that the ministry responsible for overseeing health and healthcare facilities should ensure the availability of supporting facilities necessary to deliver CPS. Participants stated the need to develop or review policies, regulations, guidelines and SOPs that govern and enforce the participation of pharmacists in clinical activities, including ward rounds and clinics.

Firstly, the ones preparing the guidelines are supposed to prepare a special guideline on clinical pharmacy, and it should be part of the services in all hospitals from the lowest level up to the highest. Also, there should be employment positions for clinical pharmacists in the hospitals. IDI-participant7

Strengthening dispensing services was reported to be an excellent strategy to improve provision of adequate information and counselling to patients on medication use. Lack of space has resulted in most pharmacists failing to provide patient information due to a lack of privacy and confidentiality. Therefore, participants acknowledged that provision of CPS can be improved when dispensing outlets are strengthened in the hospitals. One participant said:

...The areas for service delivery have been challenging for a pharmacist to provide adequate services. I propose that the dispensing outlets should be improved to have adequate space and privacy for a provider to give instructions and counselling for medication use to patients. FGD8-participant2

This study documented the challenge of human resource inadequacy at each of the five hospitals. The participants expressed the view that improving the provision of CPS could be achieved if the governing bodies fostered a favourable working environment within healthcare facilities by employing a sufficient number

of pharmacists, thereby encouraging their active involvement in CPS provision.

The main thing to improving this service is to have clinical pharmacists and the employment of an adequate number of pharmacists to create an environment that supports their active involvement in patient care. IDI-participant1

Establishing a minimal financial incentive package was an additional approach the participants mentioned to encourage the implementation of CPS. They expressed that a friendly work environment characterised by enhanced interprofessional communication will eventually nurture an intrinsic motivation among pharmacists to participate actively in the clinical aspects.

“... The standardisation of incentives and allowances is needed for people involved in CPS to get an equal chance of financial benefits as those who dispense medications. It will raise the motivation of pharmacists to provide CPS and improve patient outcomes. FGD3-participant3

Moreover, participants suggested the provision of seminars among the HCPs to raise awareness of the importance of involving pharmacists in the clinical aspects of patient care through the provision of CPS. They expressed that awareness campaigns should be designed to change the attitudes of all HCPs regarding their superiority or inferiority in patient care. As stated by one of the hospital's medical services directors:

We need to raise awareness through training other staff and patients on the importance of having CPS. Patients must be well informed to demand this service; this is an important issue to be done. IDI-participant10

Comparisons between healthcare providers and administrators

Participants' responses obtained from both techniques were mainly similar and supportive. However, there were few differences observed when we compared the feedback from administrators and that of HCPs. Under the first theme, participants' responses on strengthening preservice training were similar concerning adding more time for clinical rotations to undergraduate students and including clinical pharmacy in the training curricula. However, few participants had a misperception that clinical pharmacy requires simply studying pharmacology. Based on the second theme, the demand to improve continuing professional development education by providing a short course on CPS to in-service HCPs was expressed mainly by HCPs themselves. Under the fourth theme, most participants wanted to establish a financial incentive to motivate pharmacists to involve themselves in clinical services. However, other participants from both techniques believed that once CPS is stipulated as their core duty, they will be compelled to provide this service to patients regardless of being fewer in hospitals or other circumstances.

DISCUSSION

This study aimed to explore the strategies to improve provision of CPS in Tanzania. Our findings revealed that

strengthening preservice training and continuing health professional development would improve the competencies of pharmacists to provide CPS. Further, revising the scope of work for pharmacists to include provision of CPS in the scheme of services and job descriptions and creating an enabling operational environment for HCPs are the primary strategies to improve patient care in the health facilities. However, lack of support from policy-makers and respective authorities such as the Ministry of Health, pharmacy council and hospital management and lack of intrinsic motives and readiness among pharmacists may pose barriers to these strategies.

Our findings show that changing the undergraduate pharmacy training curricula to include clinical pharmacy components and increasing the time allocated for patient-centred care for pharmacy students could be a good strategy for implementing CPS effectively. Few universities in Tanzania offer formally structured clinical pharmacy training to undergraduate pharmacy students. For those universities that provide training in clinical pharmacy, the time allocated for clinical work is limited to 3 months.³¹ This is similar to what was reported by Njuguna *et al* in a study conducted in the African region. In that study, it was reported that the training in Africa is heavily didactic, with little time allocated for direct patient care. Therefore, the undergraduate pharmacy training curricula should be reformed to prepare hospital-based pharmacists to provide CPS.^{19 32}

Nevertheless, participants underscored the importance of curriculum standardisation due to their observation of variations in the capacity of pharmacists who graduated from different local medical universities to provide CPS to patients. This calls for the universities to harmonise their Bachelor of Pharmacy Degree Program curricula. Similarly, other studies have also emphasised that the focus on training clinical pharmacy should be contextualised based on the geographical prevalence of diseases.^{33 34} Furthermore, introducing interprofessional education and improving communication skills in pharmacy curricula empower and transform pharmacists' attitudes and make them bold enough to work collaboratively with medical practitioners and nurses.

As revealed in this study, limited competencies characterised by the lack of continuing professional development education among pharmacists resulted in their sub-optimal participation in clinical patient care. It is necessary to provide available pharmacists with sustainable on-the-job training to equip them with the skills needed to provide CPS. Furthermore, the pharmacy department in hospital settings emphasised scheduling routine case presentation meetings to facilitate pharmacists' self-directed learning. The latter builds their expertise and experience in the provision of CPS. It has been demonstrated that short course training for in-service providers can bring good transformation in the CPS, especially when greater emphasis is placed on hands-on activities throughout the training sessions.^{19 35–37} In addition, interdisciplinary training sessions could provide

a forum for HCPs to discuss clinical patient care and medication therapy while exchanging new knowledge and skills. Engaging in hospital weekly clinical meetings alongside other HCPs enhances knowledge transfer and fosters inter-professional collaborations, which have the potential to yield positive outcomes when pharmacists and other HCPs provide patient care as a team.³⁸

In Tanzania, very few universities offer master's degrees in clinical pharmacy; thus, the country has insufficient pharmacists specialising in clinical pharmacy. To ensure effective implementation of the CPS provision, the available clinical pharmacists and pharmacists who have obtained training in the clinical pharmacy should provide clinical coaching, supportive supervision and mentorship to pharmacists with little exposure to direct patient care as ways to improve their practice. It is well documented that regular clinical mentorship and supervision of providers are efficient ways to convey updates on clinical practice, including implementing CPS in hospital settings. Further, supportive clinical supervision fosters effective communication, therapeutic problem-solving and quality care.^{39–41} This will help to tackle the barriers, such as lack of confidence due to limited skills and poor interprofessional communication resulting from inferiority and superiority behaviours that have been reported to hinder the provision of clinical pharmacy services.⁴² Additionally, hospital administrators should prepare precise schedules for pharmacists to participate in the clinical ward rounds and patient medication reviews as a good starting point to foster the adoption of CPS in health facilities.²¹

Although our study indicates that hospital settings have a high demand for CPS, there is a need to review the scheme of work and job descriptions of pharmacists to enforce their participation at ward rounds, clinics and other direct patient care activities that promote the health and well-being of patients. In Tanzania, pharmacists rarely provide CPS because it has not been stipulated in their scheme of work and job description as a primary role. Currently, Tanzania has a regulation about the provision of CPS, which was launched in 2020. However, no updated job descriptions have been circulated for the provision of CPS.²² Moreover, clinical pharmacists are not recognised as specialists among healthcare professionals under the scheme of services. A similar situation was reported in South Africa, indicating the need for revised job descriptions and service schemes to recognise clinical pharmacists.³ As suggested by our study participants, the Tanzanian Pharmacy Council should look into enforcing the provision of CPS. The pharmaceutical society also plays a crucial role in enhancing effective CPS by encouraging clinical pharmacists to establish groups of special clinical interests to impact patient outcomes⁴³ positively.⁴³

The availability of policies, guidelines and SOPs that accommodate CPS could be beneficial in educating pharmacists and providing guidance on the provision of CPS.⁴⁴ In developed countries, effective implementation of CPS is attributed to well-established policies

and guidelines.⁴⁵ Therefore, the Ministry of Health must ensure the integration of CPS into the healthcare system and create policies that recognise CPS as an essential component of patient care. Further, hospitals must provide the necessary infrastructure to facilitate CPS via telemedicine. It has been reported that telemedicine in the form of tele-pharmacy is the most effective method for hospital pharmacists to conduct close post-discharge patient follow-up.^{15 46} For example, in Slovenia, ambulatory clinical pharmacy services have contributed to effective CPS and positive patient outcomes.¹⁶ Tanzania could also benefit from improving hospital-based CPS as a foundational step and exploring ambulatory CPS models as the next step.

This study reported that increasing the number of pharmacists stationed in hospital units or wards may be an effective strategy for improving provision of CPS. Comparable research in Vietnam reported that an adequate number of pharmacists, particularly clinical pharmacists, enabled the effective provision of CPS in hospitals.⁴⁷ Sub-Saharan African countries have documented a scarcity of human resources for health, including pharmacists.^{19 48} In Tanzania, many graduate pharmacists are unemployed due to a lack of employment opportunities in healthcare facilities. Our study findings indicate the need for hospitals to increase the employment of pharmacists to implement CPS effectively. Nevertheless, amidst these challenges, insurance companies could play a vital role in facilitating the effective implementation of CPS in hospitals by providing reimbursement for pharmacists' services, eventually reducing overall healthcare costs by reducing medical-related problems in patients.

Creating awareness among HCPs about CPS will prepare them to collaborate with pharmacists, especially during ward rounds, clinic visits and other patient care activities. In Ethiopia, it has also been documented that HCPs, particularly medical doctors and nurses, possess a low level of awareness.⁴⁹ In that study, over 50% of HCPs were unaware of CPS and held a negative attitude towards pharmacists' involvement in the healthcare team. Therefore, sensitisation campaigns to raise awareness regarding CPS were considered the best option to change the perception of HCPs. This may include but is not limited to establishing channels for promoting effective communications between clinical pharmacists and other HCPs. Such initiatives will address communication gaps, inferiority and superiority complex, which have been pointed out as barriers to implementing CPS in LMICs. Evidence shows that sensitisation campaigns to HCPs have a positive impact on improving provision of CPS.^{47 49}

Strengths and Limitations of the study

The results of this study are being used to inform health training institutions to strengthen the training curricula of pharmacists to improve the provision of clinical pharmacy services in Tanzania and other settings of similar contexts. This study is not without limitations. With a

qualitative design, subjectivity and bias are likely to occur, and the perspective of the researchers can influence how findings are interpreted. To mitigate this bias, researchers employed several techniques, including bracketing, peer debriefing, triangulation of data sources and methods, reflexivity and member checking. Further, social desirability may have limited our findings since data collection was led by researchers involved in training pharmacy and nursing programmes. HCPs may have felt compelled to provide desired responses rather than truthful ones. However, the fact that data collectors have adequate probing skills and are not very senior compared with the participants offsets this limitation. Lastly, some administrators could be expected to have less clinical care of patients than HCPs. Therefore, their answers may have been driven more by personal beliefs rather than clinical experience. The triangulation of data sources, data collection methods, researchers and sites offset this limitation.

CONCLUSION

This study has provided information about the strategies to optimise CPS provision in healthcare facilities. These strategies focus on reviewing the Bachelor of Pharmacy Degree Program curriculum to align with competency-based education, allowing students more time for skills acquisition. In addition, there has been a strong emphasis on the necessity of employing adequate human resources for health and improving the competencies of available pharmacists through sustainable continuing medical education programmes. Efforts should be made to initiate the provision of CPS with experienced pharmacists who are available in health facilities and can offer supportive supervision to the non-trained pharmacists. Hospitals are highly encouraged to use intern pharmacists to provide CPS as a component of their training and service delivery. As strongly recommended by stakeholders, a short course for in-service pharmacists should be developed to train and build pharmacists' competencies in providing CPS in hospital settings. We recommend future research to assess the readiness of health training institutions to revise and incorporate clinical pharmacy components into their training curricula for the bachelor's degree of pharmacists.

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