



Enhancing Medication Safety: The Role of Community and Hospital Pharmacists in Modern Healthcare Systems

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Abstract

Medication safety remains a cornerstone of healthcare delivery, necessitating a comprehensive approach within community and hospital pharmacy settings. Community pharmacies serve as accessible points of care, bridging the gap between healthcare providers and patients by offering essential services such as prescription management, health counseling, and immunizations. Conversely, hospital pharmacies function within structured healthcare environments, focusing on the preparation, monitoring, and administration of complex medication regimens, often tailored to individual patient needs. This article explores the pivotal roles pharmacists play in ensuring medication safety, emphasizing their responsibilities in dispensing accuracy, patient education, and inter-professional collaboration. It highlights the challenges faced globally and in Bangladesh, including workforce shortages, regulatory inconsistencies, and technological constraints. By contrasting global best practices with the current state in Bangladesh, the discussion underscores the need for policy reforms, advanced training, and resource optimization to align local practices with international standards. The integration of emerging technologies and enhanced professional education is imperative to advance the roles of pharmacists in both community and hospital settings. A unified approach that prioritizes patient-centered care, continuous professional development, and robust regulatory frameworks can significantly enhance medication safety outcomes. This review concludes with recommendations for bridging the gap between global benchmarks and localized practices to achieve sustainable healthcare improvements.

Keywords: Medication safety, community pharmacy, hospital pharmacy, patient care

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Introduction

Medication safety is a critical concern in both community and hospital pharmacy settings. The proper management of medications is essential to prevent adverse drug events, which can lead to severe health complications or even fatalities (Tobaiqy & MacLure, 2024). These settings are often the first and last points of contact in a patient's medication journey, making them pivotal in ensuring accuracy, appropriateness, and adherence. By prioritizing medication safety, community and hospital pharmacies safeguard public health, reduce healthcare costs associated with errors, and enhance the overall quality of care delivered to patients. Ensuring the safe use of medications is essential for preventing adverse drug events, improving therapeutic outcomes, and fostering trust in healthcare systems. Community and hospital pharmacies play pivotal roles in managing medications, minimizing errors, and enhancing patient care. A community pharmacy is a retail-based establishment where pharmacists and staff provide patients with prescription medications, over-the-counter drugs, and health advice. These pharmacies act as a bridge between healthcare providers and patients, promoting accessibility, preventive care, and public health education. Community pharmacists also offer services like vaccination, health screenings, and medication therapy management, making them integral to primary healthcare (Alghamdi et al., 2023); (Fares et al., 2025).

On the other hand, a hospital pharmacy operates within healthcare institutions, managing the preparation, dispensing, and monitoring of medications for both inpatients and outpatients. Hospital pharmacies ensure that medication use aligns with clinical protocols, patient-specific needs, and evidence-based practices (Aljuhani et al., 2024); (Bronkhorst et al., 2020). They often collaborate with multidisciplinary healthcare teams to optimize treatment plans, address complex cases, and contribute to research and policy development. Together, these two domains form the backbone of medication management in healthcare systems, emphasizing the importance of safety, efficacy, and patient-centered care. As the healthcare landscape evolves, both community and hospital pharmacies continue to adapt, integrating advanced technologies and expanding their roles to meet growing demands. Medication safety is a critical concern in both community and hospital pharmacy settings. Community and hospital pharmacies play pivotal roles in ensuring the proper use of medications, minimizing errors, and improving patient outcomes. This essay explores the responsibilities, qualifications, and global practices associated with these two pharmacy domains, emphasizing the importance of maintaining safety in medication management.

Research Objectives

The primary objectives of this research are:

- ❖ Explore Pharmacists' Roles: Investigate the unique and overlapping roles of community and hospital pharmacists in ensuring medication safety and promoting patient care.
- ❖ Global vs. Local Practices: Analyze global standards in pharmacy operations and compare them with the practices in Bangladesh to highlight gaps and opportunities for growth.
- ❖ Identify Challenges: Understand the key barriers, such as resource limitations, regulatory gaps, and workforce issues, that hinder optimal pharmacy practices in Bangladesh.
- ❖ Innovative Solutions: Examine how emerging technologies, such as telepharmacy and medication therapy management systems, can enhance pharmacy practices.
- ❖ Actionable Recommendations: Provide specific strategies for policy reform, training improvement, and fostering collaboration between community and hospital pharmacists.

Methodology

This research employs a mixed-method approach, incorporating qualitative and comparative analysis. The methodology involves:

Literature Review

Comprehensive review of peer-reviewed articles, guidelines, and reports from organizations such as the International Pharmaceutical Federation (FIP), WHO, and national regulatory bodies.

Historical and contemporary analysis of pharmacy practices to identify trends and benchmarks.

Comparative Analysis

A detailed comparison of global pharmacy practices with those in Bangladesh, highlighting strengths, gaps, and areas for improvement.

Case Study Approach

Specific cases from developed countries were used to illustrate advanced practices, such as telepharmacy and medication therapy management.

Examples from Bangladesh were examined to understand challenges, such as resource constraints and workforce limitations.

Critical Appraisal of Policies

Evaluation of regulatory frameworks governing pharmacy practices globally and locally, with a focus on policy impact and implementation challenges.

Application of Methodologies

The methodologies were utilized as follows:

- Literature Review: Enabled the identification of existing research gaps and provided a foundation for comparing global and Bangladeshi practices.
- Comparative Analysis: Facilitated the identification of key differences in educational, operational, and regulatory aspects of pharmacy practices across regions.
- Case Study Approach: Offered real-world insights into successful interventions and practices that can be adapted to the Bangladeshi context.
- Critical Appraisal: Helped evaluate the effectiveness of policies and their alignment with global standards.

Results and Discussion

Community Pharmacy

A community pharmacy, often referred to as a retail pharmacy, is a healthcare facility where pharmacists provide prescription medications, over-the-counter drugs, and health advice to the public. These pharmacies serve as accessible points for medication dispensing, health consultations, and preventive care services. Community pharmacies also play an essential role in public health by offering services such as immunizations, health screenings, and smoking cessation programs. They are integral to improving health literacy by educating patients on the proper use of medications and the importance of adherence. Community pharmacy, also known as retail pharmacy, serves as the first point of contact for individuals seeking health advice and medications. It bridges the gap between healthcare providers and patients, focusing on the accessibility and provision of over-the-counter (OTC) and prescription medications.

Historical Aspects of Community Pharmacy

Community pharmacy has its roots in ancient apothecaries, where pharmacists were responsible for compounding and dispensing medications. Over time, the profession has evolved to include counseling, health promotion, and preventive care. The concept of community pharmacy dates back to ancient times, where apothecaries were responsible for preparing and selling medicinal

products derived from natural sources. During the Middle Ages, apothecaries expanded their services, combining roles of herbalists, chemists, and medical advisors. By the 19th century, industrial advancements facilitated the mass production of medications, prompting pharmacies to focus on dispensing rather than compounding. This shift allowed pharmacists to devote more time to patient care and medication safety. Today, community pharmacies are vital components of healthcare systems, evolving to provide expanded clinical services, including chronic disease management and telepharmacy.

People and Staff in Community Pharmacy

A typical community pharmacy employs pharmacists, pharmacy technicians, and support staff. Pharmacists oversee operations, provide patient consultations, and ensure compliance with regulations. Pharmacy technicians assist in preparing prescriptions, managing inventory, and handling customer inquiries. A community pharmacy typically comprises a team of professionals, including licensed pharmacists, pharmacy technicians, and support staff. Pharmacists are the primary healthcare providers in this setting, responsible for ensuring the safety, efficacy, and appropriate use of medications. They provide direct patient care, educate patients on potential side effects, and counsel on medication adherence. Pharmacy technicians support pharmacists by preparing prescriptions, managing inventory, and performing administrative tasks. Support staff, such as cashiers and delivery personnel, ensure the smooth logistical functioning of the pharmacy. In larger pharmacies, specialized roles like immunization specialists or clinical pharmacy advisors may also be included.

Qualifications for Community Pharmacy

To work as a pharmacist in a community pharmacy, individuals must obtain a Bachelor of Pharmacy (BPharm) or Doctor of Pharmacy (PharmD) degree from an accredited institution. This education provides a comprehensive understanding of pharmacology, medicinal chemistry, and patient care. After completing their degree, pharmacists must undergo a period of supervised practice or internship to gain practical experience. Licensure examinations, such as the North American Pharmacist Licensure Examination (NAPLEX) or its equivalents in other countries, are required to practice legally. Continuing education is also crucial for pharmacists to stay updated with the latest developments in medication therapy and safety protocols. Pharmacy technicians typically require vocational training, certification, or associate degrees, depending on local regulations (International Pharmaceutical Federation, 2012).

Community Pharmacy Practice

Community pharmacy practice encompasses various responsibilities, including medication dispensing, patient counseling, health promotion, and the provision of clinical services. Pharmacists working in community settings play a crucial role in ensuring that medications are safely and effectively used, helping patients manage their health, and fostering broader public health initiatives.

❖ Dispensing Medications

Dispensing medications accurately is the foundation of community pharmacy practice. Pharmacists ensure prescriptions are filled correctly, including verifying dosages, checking for potential drug interactions, and confirming the appropriateness of medications based on a patient's medical history. This process reduces the risk of medication errors and promotes patient safety. Furthermore, pharmacists monitor for medication adherence, helping patients understand their treatment regimens.

❖ Patient Counseling and Education

Pharmacists offer essential counseling services, providing patients with the information needed to take their medications safely. They discuss possible side effects, proper usage, and precautions, especially for over-the-counter medications and supplements. This counseling

extends to educating patients about managing chronic conditions such as diabetes, asthma, and hypertension. According to (Religioni et al., 2025), effective counseling by pharmacists can improve medication adherence and therapeutic outcomes, leading to better health management.

❖ Health Screenings and Preventive Services

Community pharmacists frequently conduct screenings for common health conditions such as hypertension, cholesterol, and diabetes. These screenings allow for early detection of potential health issues, which can prompt referrals to healthcare providers for further evaluation and treatment. Community pharmacies also engage in preventive health services, such as immunizations, which have become a critical component of public health efforts. Many pharmacies are authorized to administer vaccines for influenza, pneumonia, and even COVID-19, contributing significantly to vaccination rates.

Medication Therapy Management (MTM)

Medication therapy management is a service provided by pharmacists to optimize therapeutic outcomes for patients, particularly those with complex medication regimens. MTM involves reviewing a patient's complete medication profile, identifying issues like drug interactions, duplicate therapy, or non-adherence, and making necessary adjustments. This service is vital for patients with chronic diseases who are often on multiple medications. Through MTM, pharmacists can help patients better manage their conditions, reduce the risk of adverse drug events, and enhance the overall quality of care.

❖ Role in Patient Advocacy and Care Coordination

Pharmacists also act as patient advocates, helping patients navigate complex healthcare systems. They may assist patients with insurance issues, help them access lower-cost medications, or advise on alternative therapies. Additionally, pharmacists work collaboratively with other healthcare providers to ensure continuity of care, particularly in cases where patients have multiple providers managing their health.

Roles and Duties of a Community Pharmacist

Community pharmacies are an integral part of the healthcare system, providing vital services to ensure the safe and effective use of medications, promote health, and improve overall community well-being. The roles and duties of community pharmacists encompass a wide range of activities, including dispensing medications, patient counseling, conducting health screenings, performing medication reviews, and engaging in health promotion. Pharmacists in community pharmacies have multifaceted and diverse roles aimed at improving patient outcomes and ensuring medication safety. These roles include:

1. Dispensing Medications

Pharmacists are responsible for accurately preparing and verifying prescriptions to ensure that patients receive the correct medication and dosage. This process involves checking for potential drug interactions, contraindications, and ensuring the medication is appropriate for the patient's condition. Additionally, pharmacists provide guidance on the proper use of medications, including dosage instructions and potential side effects.

2. Patient Counseling

Pharmacists educate patients on the proper use of medications, potential side effects, and interactions with other drugs or foods. Effective patient counseling can prevent medication errors and improve patient adherence to prescribed therapies.

3. Health Screenings

Community pharmacists conduct routine health checks such as blood pressure monitoring, diabetes screenings, and cholesterol testing. These screenings help identify potential health issues early and

guide necessary interventions. Pharmacists may also refer patients to physicians or other healthcare professionals for further evaluation.

4. Medication Reviews

Pharmacists assess patients' medication regimens to identify potential issues, such as duplicate therapies or contraindications. This is particularly important for patients on complex medication regimens or those with multiple chronic conditions. By identifying and resolving medication-related problems, pharmacists contribute to better health outcomes.

5. Health Promotion

Pharmacists promote healthy lifestyles by providing smoking cessation programs, weight management advice, and vaccination services. These initiatives help prevent chronic diseases and improve the overall health of the community.

6. Medication Therapy Management (MTM)

Pharmacists provide comprehensive medication management services, including reviewing all medications a patient is taking to ensure they are appropriate, effective, and safe. MTM aims to optimize therapeutic outcomes by identifying and resolving medication-related problems.

7. Chronic Disease Management

Community pharmacists play a crucial role in managing chronic diseases such as hypertension, diabetes, and asthma. They monitor patient progress, adjust medication regimens as needed, and provide education to help patients manage their conditions effectively.

8. Regulatory Compliance and Safety

Pharmacists ensure that all medications are stored, dispensed, and disposed of in accordance with legal and ethical guidelines. They monitor the quality, safety, and use of medicines, which requires a high level of interaction with patients, providing advice and information about the use of medicines and medical appliances.

9. Community Education and Outreach

Pharmacists engage in community education by providing information on health topics, conducting workshops, and participating in health fairs. This outreach helps raise awareness about health issues and promotes preventive care within the community.

10. Telepharmacy and Telehealth Services

With advancements in technology, community pharmacists are increasingly offering telepharmacy and telehealth services. These services allow pharmacists to provide consultations, medication management, and health advice remotely, improving access to care, especially in underserved areas. To effectively maintain these roles, community pharmacies must adopt a patient-centered approach, ensuring high standards of care and safety. This includes ongoing staff training, investment in technology, and adherence to regulatory and ethical standards. The following are ways to maintain and improve these roles:

- Continuous Education: Pharmacists must engage in continuous professional development to stay informed about new medications, health guidelines, and technological advancements. This includes attending workshops, earning certifications, and participating in professional organizations.
- Quality Assurance: Community pharmacies should implement quality assurance practices, such as regular audits, safety checks, and patient feedback mechanisms, to ensure that all services meet high standards.
- Patient Collaboration: Collaboration with other healthcare professionals, such as physicians and nurses, is essential for providing coordinated care. Effective communication between healthcare providers ensures that the patient's health needs are comprehensively addressed.

- Technological Integration: The use of electronic health records, pharmacy management systems, and digital health tools can streamline medication management, improve patient safety, and enhance the efficiency of pharmacy operations.

Ethical Guidelines for Community Pharmacy

Community pharmacists adhere to ethical principles such as confidentiality, patient autonomy, and non-maleficence. They must prioritize patient safety, avoid conflicts of interest, and comply with legal regulations. Community pharmacists adhere to ethical principles that prioritize patient welfare, confidentiality, and professional integrity. Key ethical guidelines include:

- ❖ Patient-Centered Care: Placing the patient's needs above all other considerations.
- ❖ Confidentiality: Ensuring the privacy of patient information.
- ❖ Non-Maleficence: Avoiding actions that may harm the patient.
- ❖ Professional Competence: Maintaining up-to-date knowledge and skills to provide accurate advice and services.
- ❖ Justice: Pharmacists strive to ensure fair distribution of healthcare resources and equitable access to medications and services.

Challenges and Ethical Considerations

Community pharmacists often encounter ethical challenges, including:

- Professionalism and Practice Challenges: Balancing business interests with patient care priorities can lead to ethical dilemmas.
- Communication Issues: Ensuring clear and effective communication with patients and healthcare providers is essential to prevent misunderstandings and errors.
- Regulatory Compliance: Adhering to evolving regulations and policies requires pharmacists to stay informed and adaptable.

Addressing these challenges necessitates ongoing education, open communication, and a steadfast commitment to ethical principles.

To uphold these ethical standards, community pharmacies should:

- Engage in Continuous Professional Development: Regular participation in educational programs and professional development activities ensures that pharmacists stay informed about the latest advancements in pharmacy practice.
- Implement Quality Assurance Measures: Establishing protocols for medication dispensing, patient counseling, and health screenings helps maintain high standards of care and patient safety.
- Foster Open Communication: Encouraging transparent communication among pharmacists, patients, and other healthcare providers promotes trust and collaborative care.
- Adhere to Regulatory Requirements: Compliance with local and international regulations governing pharmacy practice ensures that ethical standards are met and maintained.

By adhering to these ethical guidelines and maintaining high standards of practice, community pharmacies can effectively serve the health needs of their communities.

Community Pharmacy in a Global Context

Globally, community pharmacies vary in scope. Developed countries emphasize advanced services such as vaccination and chronic disease management. In contrast, developing nations often face challenges such as limited resources and workforce shortages. Globally, community pharmacies play an increasingly significant role in healthcare systems. In developed countries, they offer advanced clinical services such as chronic disease management and pharmacogenomic testing. These

pharmacies are highly integrated with healthcare networks, enabling seamless communication with other healthcare providers.

Community pharmacies serve as essential components of healthcare systems worldwide, offering a range of services that extend beyond traditional medication dispensing. Their roles and responsibilities vary across different countries, influenced by local healthcare needs, regulations, and cultural contexts.

Global Roles and Duties of Community Pharmacies

- Medication Dispensing and Management: Community pharmacists are responsible for accurately preparing and verifying prescriptions, ensuring patients receive the correct medication and dosage. This process includes checking for potential drug interactions and contraindications.
- Patient Counseling and Education: Pharmacists educate patients on the proper use of medications, potential side effects, and interactions with other drugs or foods. Effective counseling enhances patient adherence to prescribed therapies.
- Health Screenings and Preventive Services: Community pharmacies conduct routine health checks such as blood pressure monitoring, diabetes screenings, and cholesterol testing, aiding in early detection and management of health conditions.
- Health Promotion: Pharmacists promote healthy lifestyles by providing smoking cessation programs, weight management advice, and vaccination services, contributing to community health and well-being.

Global Challenges and Considerations

Despite their critical roles, community pharmacies face several challenges:

- ✓ Access and Availability: In some regions, particularly rural areas, there is a shortage of community pharmacies, leading to "pharmacy deserts" where residents have limited access to essential pharmaceutical services.
- ✓ Regulatory Variations: The scope of practice for community pharmacists varies globally, influenced by differing legal and regulatory frameworks. Some countries have expanded pharmacists' roles to include prescribing medications and providing advanced clinical services, while others maintain more traditional functions.
- ✓ Economic Pressures: Pharmacies, especially independent ones, face financial challenges due to factors like reduced reimbursement rates, high drug prices, and competition from online retailers. These economic pressures can impact the quality and accessibility of services provided.

Future Directions

The future of community pharmacy is shaped by ongoing efforts to integrate pharmacists more fully into healthcare teams, enhance their clinical roles, and adapt to technological advancements. International organizations, such as the International Pharmaceutical Federation (FIP), are actively involved in research and policy development to support the evolution of community pharmacy practices globally.

Community pharmacy is evolving rapidly, with several key trends shaping its future direction. These developments aim to enhance patient care, integrate technology, and expand the role of pharmacists within the healthcare system.

1. Expanded Clinical Services

Community pharmacies are increasingly offering a broader range of clinical services. In regions like South Australia, pharmacists are now authorized to diagnose and treat conditions such as ear infections, wound management, and muscle and joint pain, following additional

postgraduate training. This expansion enhances access to healthcare and alleviates pressure on general practitioners (GPs) and hospitals.

2. Integration of Digital Health Tools

The integration of digital health tools is transforming community pharmacy practices. Advancements in technology enable pharmacies to provide consistent and differentiated experiences, meeting consumers where they are. Digital platforms facilitate medication management, patient education, and telehealth services, improving efficiency and patient engagement.

3. Enhanced Professional Education

To meet the evolving demands of healthcare, pharmacists are pursuing advanced education. In Australia, for example, pharmacists can now earn the title "Doctor of Pharmacy" after completing an additional three to four years of study. This initiative prepares pharmacists for a broader scope of clinical practice and enhances their role in patient care.

4. Collaborative Healthcare Models

The future of community pharmacy involves greater collaboration with other healthcare providers. Pharmacists are becoming integral members of healthcare teams, working alongside physicians, nurses, and other professionals to deliver comprehensive patient care. This collaborative approach ensures that patients receive holistic and coordinated treatment plans.

5. Addressing Healthcare Access in Rural Areas

There is a growing focus on addressing healthcare access in rural areas, often referred to as "pharmacy deserts." Efforts are underway to ensure that underserved populations have access to essential pharmacy services, which is crucial for promoting health equity and improving health outcomes in these communities.

The future of community pharmacy is characterized by expanded clinical services, the integration of digital health tools, enhanced professional education, collaborative healthcare models, and a focus on improving access in rural areas. These developments aim to position community pharmacies as central players in the healthcare system, enhancing patient care and outcomes. Community pharmacies worldwide are integral to healthcare delivery, with their roles continually evolving to meet the changing needs of populations. Addressing challenges related to access, regulation, and economics is essential to fully realize their potential in improving global health outcomes.

Recent Developments in Community Pharmacy

Recent developments in community pharmacy have reshaped the profession's role within healthcare, enhancing service offerings and expanding the scope of practice. The growth in clinical services, the integration of advanced technologies, and the evolution of professional roles have been some of the key areas driving change.

1. Expansion of Clinical Services

Community pharmacies are increasingly becoming centers for preventive healthcare and chronic disease management. Pharmacists now offer services such as health screenings, immunizations, smoking cessation programs, and diabetes management. These services not only improve patient health outcomes but also provide essential care in underserved areas. For example, in countries like the United States and the United Kingdom, pharmacies have expanded their roles in providing vaccinations and health monitoring, with some even offering point-of-care testing for conditions like cholesterol and blood glucose levels (Delhey et al., 2021). Moreover, the ongoing shift towards preventive care is allowing pharmacies to

integrate services like weight management and mental health counseling into their offerings. This move to a more patient-centered model enables pharmacists to address a broader range of health needs, enhancing their role as frontline healthcare providers (Sugi et al., 2022).

Integration of Technology

Advancements in technology are revolutionizing the way community pharmacies operate. Automation tools, such as dispensing robots, are streamlining the medication dispensing process, increasing efficiency, and reducing the likelihood of errors (Bolivar et al., 2023). Additionally, the rise of telepharmacy has enabled pharmacists to conduct consultations remotely, improving access to care, particularly in rural and underserved areas.

Telepharmacy, through virtual consultations, provides a unique opportunity for patients to consult with pharmacists for advice on managing medications and discussing health concerns without leaving their homes. This is particularly beneficial in countries facing shortages of healthcare professionals, where community pharmacies can fill the gap in healthcare provision.

2. Professional Role Expansion

Pharmacists' roles in community settings are rapidly expanding. In several regions, they have moved from being primarily dispensers of medication to becoming key participants in the management of chronic conditions and the delivery of clinical services. In some countries, like Canada and Australia, pharmacists are authorized to prescribe certain medications, manage medication therapy, and even diagnose specific minor ailments. This evolution reflects a broader trend toward interprofessional collaboration in healthcare. Community pharmacists are now working alongside physicians, nurses, and other healthcare professionals to provide integrated care, which is crucial for managing complex, chronic conditions.

3. Policy and Regulatory Changes

Regulatory frameworks are adapting to support the growing role of pharmacists. In response to the increasing demand for healthcare services, many countries have revised policies to grant pharmacists more autonomy in clinical practice. For example, the implementation of advanced practice roles, where pharmacists are authorized to initiate, adjust, or monitor drug therapy, is becoming more common. The COVID-19 pandemic has accelerated these changes, as pharmacists were tasked with managing vaccinations and supporting testing efforts, which highlighted their potential to contribute to public health crises. Many countries are now exploring ways to further integrate pharmacists into broader healthcare strategies.

4. Challenges

Despite these advancements, community pharmacies face several challenges. Economic pressures are among the most significant, with many independent pharmacies struggling to maintain profitability due to reduced reimbursement rates, competition from large pharmacy chains, and online pharmacy services. Additionally, workforce shortages, especially in rural areas, can impact the ability of pharmacies to deliver services effectively.

Recent developments in community pharmacy demonstrate a shift towards broader healthcare roles, more integrated services, and enhanced technological capabilities. These changes have improved patient care, particularly in preventive healthcare, chronic disease management, and telehealth services. Moving forward, addressing economic challenges and ensuring adequate workforce support will be crucial for sustaining these advancements and ensuring equitable access to pharmacy services.

In Bangladesh, community pharmacies are vital for primary healthcare delivery. However, challenges include inadequate training of staff, lack of regulation, and limited public awareness. Efforts are underway to improve standards and integrate advanced practices. In Bangladesh, community pharmacies are essential for primary healthcare delivery. However, challenges such as insufficient training, lack of regulation, and inadequate public awareness hinder their effectiveness. Efforts are being made to standardize practices and improve professional education to align with global standards. Community pharmacy in Bangladesh plays a pivotal role in the healthcare system, serving as the primary point of contact for many individuals seeking medical advice and medication. The sector has undergone significant transformations, with ongoing efforts to enhance the quality of services and the professional standards of pharmacists.

Regulatory Framework and Professional Standards

The Pharmacy Council of Bangladesh (PCB), established in 1976, is the regulatory body overseeing pharmacy education and practice in the country. It is responsible for formulating policies to improve the quality of pharmacy education and practice, ensuring that pharmacists meet the necessary standards to serve the public effectively.

Pharmacists in Bangladesh are categorized based on their education and training:

- Grade A Pharmacists: Graduates of a five-year Bachelor of Pharmacy program.
- Grade B Pharmacists: Holders of a three-year Diploma in Pharmacy.
- Grade C Pharmacists: Individuals with a Secondary School Certificate who have completed a three-month training course.

The introduction of Grade C pharmacists aims to address the shortage of qualified professionals, though it has raised concerns regarding the adequacy of their training.

Current Practices and Challenges

Despite the regulatory framework, community pharmacy practice in Bangladesh faces several challenges:

- Quality of Services: Studies indicate that a significant portion of pharmacies are operated by Grade C pharmacists with minimal training, leading to concerns about the quality of services provided.
- Irrational Use of Medicines: The unregulated nature of many private retail drug shops contributes to the irrational use of drugs, including the sale of over-the-counter medications without prescriptions.
- Lack of Patient Counseling: There is a scarcity of patient counseling services, which affects the rational use of medicines and patient adherence to prescribed therapies.

Recent Developments

Efforts are underway to address these challenges:

- **Training and Accreditation**: Initiatives like the accreditation of Model Pharmacies aim to improve dispensing practices and ensure the availability of trained drug dispensers.
- **Policy Reforms**: The government is working towards enhancing the regulatory framework to ensure better oversight of pharmacy practices and to promote the rational use of medicines.

Community pharmacy in Bangladesh is at a critical juncture, with ongoing efforts to improve the quality of services and the professional standards of pharmacists. Addressing the challenges of inadequate training, irrational medicine use, and lack of patient counseling is essential for the advancement of the sector and the betterment of public health.

Global vs. Bangladeshi Community Pharmacy Practices

Global practices prioritize specialization and integration with healthcare systems, while Bangladeshi practices are often fragmented, with an urgent need for policy reforms and professional development.

While global practices emphasize specialization, integration, and advanced services, Bangladeshi community pharmacies often operate in fragmented systems with limited resources. Globally, pharmacists engage in multidisciplinary teams and use technology for precision, whereas Bangladeshi pharmacists face workforce shortages and outdated practices. Bridging this gap requires significant investments in education, infrastructure, and policy reforms. Community pharmacies are integral to healthcare systems worldwide, providing essential services such as medication dispensing, patient counseling, and health promotion. While the core functions are similar globally, practices vary significantly between countries due to differences in healthcare infrastructure, regulations, and cultural contexts.

Table 1. Comparison Table, Global vs. Bangladeshi Community Pharmacy Practices

Aspect	Global Practices	Bangladeshi Practices
Regulatory Framework	Governed by national pharmacy councils; regulations vary by country.	Overseen by the Pharmacy Council of Bangladesh (PCB); enforcement varies.
Pharmacist Education	Typically requires a Bachelor of Pharmacy degree; some countries offer advanced degrees.	Pharmacists are categorized into Grade A, B, and C based on education and training.
Scope of Practice	Includes medication dispensing, patient counseling, health screenings, and chronic disease management.	Primarily focused on medication dispensing; patient counseling and health services are limited.
Regulatory Enforcement	Generally strict, with regular inspections and penalties for non-compliance.	Enforcement is often lacking, leading to the sale of prescription-only drugs without proper prescriptions.
Professional Development	Continuous education and specialization are common; many countries have advanced pharmacy practice programs.	Limited professional development opportunities; training programs are often short-term and not standardized.
Public Health Role	Active involvement in public health initiatives, including vaccination programs and health education.	Limited involvement in public health initiatives; primarily focused on individual patient interactions.

Key Differences:

- ✓ Regulatory Framework: Globally, community pharmacies operate under well-established regulatory bodies that enforce standards and ensure quality. In Bangladesh, while the Pharmacy Council of Bangladesh (PCB) oversees pharmacy practice, enforcement is often lacking, leading to the sale of prescription-only drugs without proper prescriptions.
- ✓ Pharmacist Education and Training: Internationally, pharmacists typically require a Bachelor of Pharmacy degree, with opportunities for further specialization. In Bangladesh, pharmacists are categorized into Grade A, B, and C based on their education and training, with Grade C pharmacists receiving minimal training.
- ✓ Scope of Practice: Globally, community pharmacies offer a broad range of services, including medication dispensing, patient counseling, health screenings, and chronic disease

management. In Bangladesh, the focus is primarily on medication dispensing, with limited patient counseling and health services.

- ✓ **Regulatory Enforcement:** Internationally, there is generally strict enforcement of pharmacy regulations, with regular inspections and penalties for non-compliance. In Bangladesh, enforcement is often lacking, leading to concerns about the quality of services provided.
- ✓ **Professional Development:** Globally, there are continuous education and specialization opportunities for pharmacists, with many countries offering advanced pharmacy practice programs. In Bangladesh, professional development opportunities are limited, and training programs are often short-term and not standardized.
- ✓ **Public Health Role:** Internationally, community pharmacies are actively involved in public health initiatives, including vaccination programs and health education. In Bangladesh, the role in public health is limited, with a primary focus on individual patient interactions.

While community pharmacies globally share core functions, practices differ significantly between countries. In Bangladesh, addressing challenges related to regulatory enforcement, pharmacist education, and the scope of practice is crucial for enhancing the role of community pharmacies in the healthcare system.

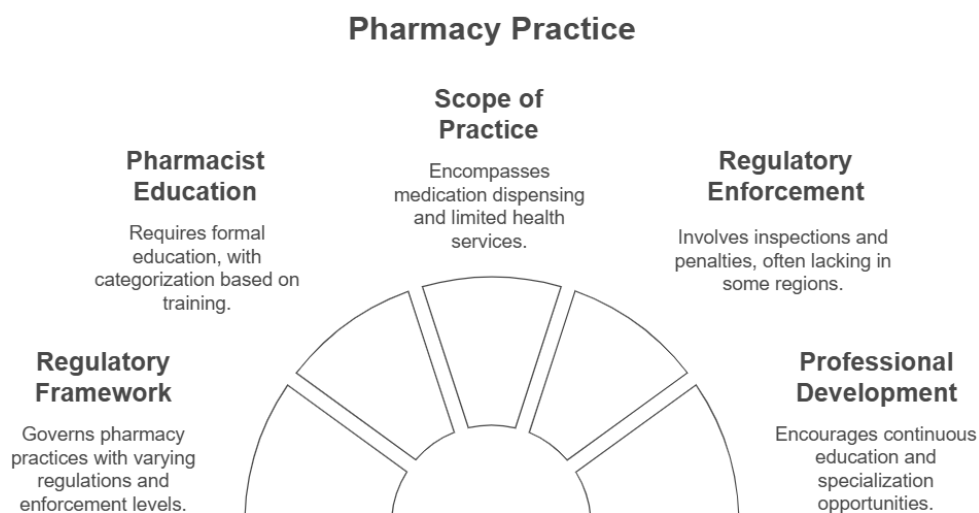


Figure 1. Overview of pharmacy practice

How Community Pharmacists Ensure Medication Safety

Community pharmacists are essential to ensuring medication safety through their active involvement in multiple facets of medication management. Their role extends beyond simply dispensing medications, as they are actively engaged in preventing medication errors, counseling patients, and collaborating with healthcare professionals to ensure safe and effective treatment outcomes.

1. Clinical Review of Prescriptions

One of the primary ways community pharmacists ensure medication safety is through the clinical review of prescriptions. Before dispensing any medication, pharmacists assess the prescribed therapies for appropriateness, checking for potential drug interactions, allergies, and contraindications. This ensures that the patient is receiving the right medication, at the

right dose, and in the proper form. By detecting issues early, pharmacists can prevent adverse drug reactions, which might otherwise compromise patient health.

1. Patient Counseling and Education

Another vital role of community pharmacists in medication safety is patient counseling. Pharmacists provide clear, detailed instructions on how to properly use prescribed medications, highlighting key aspects such as dosing schedules, potential side effects, and food or drug interactions. Counseling is crucial for promoting patient adherence to treatment plans, which in turn ensures that medications achieve their intended effects without causing harm. Effective communication between pharmacists and patients helps patients understand the importance of following their prescribed regimen, reducing the risk of misuse or underuse of medications.

2. Preventing Medication Errors

Community pharmacists are at the forefront of preventing medication errors, which can have severe consequences. These errors can occur at multiple stages, from prescribing to administration. To prevent wrong-patient errors, pharmacists ensure accurate identification during the prescription filling process and during the administration of medications, including vaccines. Pharmacists also use barcode scanning technologies to verify the correct medication and dosage, minimizing the risk of human error. Furthermore, standardizing measurement units, especially for liquid medications, helps prevent dosing mistakes (Patidar et al., 2021). These measures are part of a broader effort to create safer practices within community pharmacies.

3. Continuous Education and Professional Development

To stay up-to-date on the latest medication safety practices and emerging trends in healthcare, community pharmacists engage in continuous education and professional development. This commitment ensures that pharmacists are well-informed about new drugs, potential side effects, and best practices for managing medication safety. Staying current on evolving therapeutic strategies and regulations allows pharmacists to offer the best care possible to their patients (American Society of Health-System Pharmacists, n.d.).

4. Collaboration with Healthcare Teams

Collaboration between pharmacists and other healthcare providers is also a critical component of ensuring medication safety. Community pharmacists regularly collaborate with doctors, nurses, and other healthcare professionals to discuss patient treatment plans, adjust medications when necessary, and ensure that the overall care strategy is safe. This multidisciplinary approach helps optimize patient outcomes by aligning medication regimens with the patient's overall health needs.

5. Reporting and Learning from Errors

Pharmacists also play an active role in medication error reporting systems, ensuring that mistakes, or near-misses, are documented and analyzed to improve practices (Chance et al., 2024); (Braiki et al., 2024). This culture of safety encourages open communication about errors without fear of blame, allowing pharmacists and other healthcare providers to learn from incidents and prevent future occurrences. By participating in these reporting systems, community pharmacists contribute to the continual improvement of medication safety protocols.

Community pharmacists play an indispensable role in ensuring medication safety. Through clinical reviews, patient counseling, error prevention, professional development, and collaboration with healthcare teams, pharmacists mitigate the risks associated with medication use. Their proactive approach to managing medications contributes to better health outcomes and enhances patient safety.

Community pharmacists play a crucial role in ensuring medication safety by:

- Preventing Dispensing Errors: Implementing double-check systems and using electronic prescribing tools to minimize the risk of errors in medication dispensing.
- Educating Patients: Providing comprehensive counseling on dosage, administration, and potential adverse effects to empower patients to use medications safely.
- Monitoring Drug Interactions: Utilizing drug interaction databases to identify and mitigate risks associated with polypharmacy.
- Encouraging Adherence: Using strategies such as medication synchronization, reminders, and follow-ups to help patients adhere to their prescribed regimens.
- Reporting Adverse Events: Actively participating in pharmacovigilance programs by reporting medication-related issues to regulatory bodies.
- Providing Immunizations: Ensuring the proper storage and administration of vaccines to maintain their efficacy and safety.

Hospital Pharmacy

A hospital pharmacy is a specialized department within a hospital that focuses on the selection, preparation, storage, compounding, and dispensing of medications for hospitalized patients. Unlike community pharmacies, hospital pharmacies manage a broader spectrum of medications, including specialized and investigational drugs that are not typically available in retail settings. This extensive range ensures that patients receive tailored pharmacological therapies suited to their specific medical needs. Hospital pharmacists play a crucial role in the healthcare team by ensuring the safe and effective use of medications. Their responsibilities encompass monitoring medication supply, overseeing purchasing, manufacturing, dispensing, and quality testing of pharmaceutical stocks. In situations where commercially available medications are unsuitable or unavailable, hospital pharmacists may compound personalized medications to meet individual patient requirements. Beyond dispensing medications, hospital pharmacists provide direct patient care by counseling patients on their medication regimens, discussing potential side effects, and emphasizing the importance of adherence to prescribed therapies.

They collaborate closely with other healthcare professionals, such as physicians and nurses, to offer expert advice on drug interactions and optimal medication management, thereby enhancing patient outcomes and minimizing the risk of adverse effects (Dilles et al., 2021); (Colomer-Lahiguera et al., 2024). The evolution of hospital pharmacy has been significant over the past century. In the early 20th century, the role of hospital pharmacists was limited, often focusing on inventory control and the preparation of basic compounds. However, with the advancement of medical science and the increasing complexity of drug therapies, the profession has expanded to include clinical pharmacy services, research, and active participation in patient care teams. Hospital pharmacies are integral to the healthcare system, ensuring that patients receive appropriate, safe, and effective medication therapies during their hospital stay. The expertise of hospital pharmacists contributes significantly to patient care, medication safety, and the overall efficiency of hospital operations. Hospital pharmacy focuses on managing and dispensing medications within healthcare institutions. It ensures the safe and effective use of medications for inpatients and outpatients.

Historical Aspects of Hospital Pharmacy

Hospital pharmacy originated in medieval times when hospitals relied on herbalists and physicians for drug preparation. Today, it is a specialized field with advanced technological integration. The evolution of hospital pharmacy is a testament to the dynamic nature of healthcare and the pivotal role pharmacists have played in enhancing patient care. Tracing its origins to the mid-18th century, hospital pharmacy has undergone significant transformations, adapting to the complexities of modern medicine and the ever-changing needs of healthcare systems. In the United States, the inception of hospital pharmacy can be traced back to 1752 when the Philadelphia Hospital,

colonial America's first hospital, established its own pharmacy. Jonathan Roberts, recognized as America's first hospital pharmacist, was appointed to oversee this facility. During this era, hospital pharmacists were often apprentice physicians, reflecting the nascent stage of the profession and its close ties to medical practice.

The early 20th century marked a period of formalization and professionalization for hospital pharmacy. Prior to the 1920s, hospital pharmacy lacked a cohesive structure within the broader pharmaceutical profession. This began to change in 1936 with the formation of a subsection of hospital pharmacists within the American Pharmaceutical Association (APhA), providing these professionals with a national platform. By 1942, the establishment of the American Society of Hospital Pharmacists (ASHP), affiliated with APhA, further solidified the profession's standing. The subsequent creation of a joint hospital pharmacy division in 1947 underscored the growing recognition of hospital pharmacists' contributions to healthcare. The mid-20th century witnessed significant advancements in hospital pharmacy practice. A pivotal development was the publication of "Mirror to Hospital Pharmacy" in 1964, a comprehensive study that provided an in-depth analysis of pharmaceutical services in hospitals. This work highlighted the need for standardized practices and served as a catalyst for reforms aimed at improving medication management and patient safety within hospital settings. Internationally, the evolution of hospital pharmacy followed unique trajectories influenced by local healthcare systems and regulations.

In Belgium, for instance, the late 1970s marked the establishment of specialization in hospital pharmacy, introducing certifications that emphasized galenic formulation, hospital practice, and clinical biology. This initiative aimed to enhance the quality of pharmaceutical care in hospitals and ensure that pharmacists possessed the requisite expertise to manage complex medication therapies. The latter part of the 20th century and the early 21st century have seen hospital pharmacists take on more clinical roles, actively participating in patient care teams and contributing to therapeutic decision-making. This shift towards clinical pharmacy has been supported by research initiatives dating back to the early 1970s, focusing on pharmacokinetics and dosing strategies, thereby enhancing the efficacy and safety of medication use in hospitals.

The historical development of hospital pharmacy reflects a journey from rudimentary apothecaries within hospitals to a highly specialized and integral component of modern healthcare systems. The profession's evolution has been characterized by a continuous commitment to improving patient outcomes through safe and effective medication management, underscoring the indispensable role of hospital pharmacists in the multidisciplinary healthcare team.

People and Staff in Hospital Pharmacy

Hospital pharmacy teams include pharmacists, pharmacy technicians, clinical pharmacists, and administrative staff. Collaboration with physicians and nurses is essential for optimal patient care. A hospital pharmacy operates through the collaborative efforts of a diverse team of professionals, each fulfilling specific roles to ensure the safe and effective use of medications within the healthcare setting. At the forefront are hospital pharmacists, who are responsible for selecting, preparing, and dispensing medications tailored to individual patient needs. Their duties encompass choosing appropriate medications, monitoring drug charts, informing patients about potential side effects, overseeing drug supply, and contributing to policy-making within the hospital. Supporting the pharmacists are pharmacy technicians, who assist in dispensing medications, managing inventory, and performing administrative tasks. They play a crucial role in ensuring that prescriptions are accurately filled and that the pharmacy operates efficiently. In leadership positions, chief pharmacists oversee the entire pharmacy department, managing operations, coordinating services, and ensuring compliance with healthcare regulations. They are instrumental in strategic planning and policy development, guiding the pharmacy team towards achieving organizational goals. Additionally, clinical pharmacist specialists focus on specific areas of patient care, providing expertise in medication therapy management for particular disease states or patient populations. They collaborate closely with other healthcare providers to optimize therapeutic outcomes and contribute to the

development of clinical guidelines and protocols. Hospital Pharmacists: As medication therapy experts, hospital pharmacists are responsible for selecting, preparing, and dispensing medications tailored to individual patient needs. Their duties encompass choosing appropriate medications, monitoring drug charts, informing patients about potential side effects, overseeing drug supply, and contributing to policy-making within the hospital.

- ❖ Clinical Pharmacist Specialists: These professionals focus on specific areas of patient care, providing expertise in medication therapy management for particular disease states or patient populations. They collaborate closely with other healthcare providers to optimize therapeutic outcomes and contribute to the development of clinical guidelines and protocols.
- ❖ Pharmacy Technicians: Supporting the pharmacists, pharmacy technicians assist in dispensing medications, managing inventory, and performing administrative tasks. They play a crucial role in ensuring that prescriptions are accurately filled and that the pharmacy operates efficiently.
- ❖ Dispensing Assistants: Commonly referred to as "dispensers," these individuals prepare (dispense and label) medicines for provision to patients under the supervision of pharmacists. They ensure that medications are correctly prepared and provided to patients in a timely manner.
- ❖ Healthcare Assistants/Medicines Counter Assistants: In some healthcare systems, such as the UK, these staff members can sell certain medicines (including pharmacy-only and general sales list medicines) over the counter. They cannot prepare prescription-only medicines for supply to patients but play a role in assisting patients with over-the-counter medications.

The cohesive functioning of these professionals is vital for delivering comprehensive pharmaceutical care in hospitals. Their combined expertise ensures that patients receive safe, effective, and personalized medication therapies, highlighting the integral role of the pharmacy team in the broader healthcare system.

Qualifications for Hospital Pharmacists

A hospital pharmacist must hold a PharmD or BPharm degree, complete internships, and obtain relevant certifications. Additional training in clinical pharmacy or pharmacotherapy is often required. Hospital pharmacists are integral to healthcare teams, ensuring the safe and effective use of medications within hospital settings. To fulfill this role, they must meet specific educational and professional qualifications.

- Educational Requirements: Aspiring hospital pharmacists must obtain a Doctor of Pharmacy (Pharm.D.) degree from an accredited institution. This program typically spans four years and encompasses coursework in pharmacology, medicinal chemistry, and patient care, along with clinical rotations to provide hands-on experience.
- Licensure: After earning a Pharm.D., candidates must pass the North American Pharmacist Licensure Examination (NAPLEX) to practice in the United States. Additionally, most states require the Multistate Pharmacy Jurisprudence Examination (MPJE) or a state-specific law exam. Licensure ensures that pharmacists possess the necessary knowledge and skills to practice safely and effectively.
- Residency Training: While not always mandatory, completing a postgraduate residency program is highly recommended for those pursuing a career in hospital pharmacy. Residencies, typically lasting one to two years, offer advanced clinical training and exposure to various hospital pharmacy practices, enhancing a pharmacist's competency in patient care.
- Certification and Continuing Education: Hospital pharmacists may pursue board certification in specialized areas, such as oncology or critical care, to demonstrate advanced expertise.

Furthermore, they are required to engage in continuing education to stay abreast of evolving pharmaceutical sciences and maintain licensure.

- **Operational Role:** In their daily operations, hospital pharmacists are responsible for preparing medications, providing pharmacological information to the multidisciplinary healthcare team, and monitoring patient drug therapies. They review and interpret physician orders, detect therapeutic incompatibilities, and dispense medications by compounding, packaging, and labeling pharmaceuticals. Additionally, they control medications by monitoring drug therapies and advising on interventions.

Hospital pharmacists are highly trained professionals whose qualifications encompass extensive education, licensure, and, often, specialized training. Their comprehensive expertise enables them to manage complex medication therapies and contribute significantly to patient care within hospital environments.

Roles and Duties of a Hospital Pharmacist

Hospital pharmacists are integral members of the healthcare team, ensuring the safe and effective use of medications within hospital settings. Their roles and duties encompass a broad spectrum of responsibilities, each crucial to patient care and the overall functioning of the hospital pharmacy.

- **Medication Management:** Hospital pharmacists are responsible for selecting, preparing, and dispensing medications tailored to individual patient needs. They assess prescriptions for accuracy, appropriateness, and potential drug interactions, ensuring optimal therapeutic outcomes. Additionally, they monitor patient responses to medications and adjust treatment plans as necessary.
- **Clinical Consultation:** Serving as a vital source of information, hospital pharmacists provide advice on the selection and correct use of drugs to both healthcare professionals and patients. They offer guidance on dosages, potential side effects, and the most appropriate form of medication, contributing to informed decision-making within the healthcare team.
- **Patient Counseling:** Hospital pharmacists engage directly with patients, educating them about their medications, proper administration techniques, and the importance of adherence to prescribed therapies. This counseling helps patients understand their treatment regimens, promotes compliance, and empowers them to manage their health effectively.
- **Inventory Management:** Managing the hospital's medication inventory is a critical duty. Pharmacists ensure that medications are stored under proper conditions, monitor stock levels to prevent shortages, and oversee the procurement of pharmaceuticals. This meticulous management guarantees that necessary medications are readily available for patient care.
- **Discharge Planning:** Hospital pharmacists play a key role in the discharge process by reviewing patients' medication regimens, ensuring continuity of care, and providing necessary medications upon discharge. They verify that discharge prescriptions are accurate and educate patients on any new medications, thereby reducing the risk of readmission due to medication errors.
- **Interdisciplinary Collaboration:** Working closely with physicians, nurses, and other healthcare professionals, hospital pharmacists contribute to the development of treatment plans and clinical guidelines. Their expertise in pharmacotherapy is essential in making informed decisions that enhance patient outcomes.

Hospital pharmacists perform a multifaceted role that extends beyond dispensing medications. Their comprehensive responsibilities in medication management, patient education, inventory

control, and collaborative healthcare delivery are vital to the effective operation of hospital pharmacies and the provision of high-quality patient care.

Hospital pharmacists' responsibilities also include:

Patient Monitoring: Ensuring efficacy and safety of prescribed therapies.

Education: Training staff and educating patients about medication use.

Ethical Guidelines for Hospital Pharmacists

Hospital pharmacists must adhere to principles such as beneficence, accuracy, and integrity. They must ensure transparency, avoid medication errors, and uphold patient trust. Hospital pharmacists adhere to a comprehensive set of ethical guidelines that govern their professional conduct, ensuring the delivery of safe, effective, and compassionate patient care. These principles are encapsulated in the Code of Ethics for Pharmacists, which outlines the moral framework within which pharmacists operate.

- Patient Welfare and Confidentiality: A fundamental tenet of pharmaceutical ethics is the commitment to prioritize patient well-being. Pharmacists are dedicated to serving patients in a caring, compassionate, and confidential manner, placing the patient's needs at the center of professional practice. This involves safeguarding patient privacy and ensuring that all interactions and information are handled with the utmost discretion.
- Respect for Autonomy and Dignity: Pharmacists are obligated to respect the autonomy and dignity of each patient. This entails promoting patients' rights to self-determination by encouraging their participation in health-related decisions and communicating in understandable terms. Pharmacists must also respect personal and cultural differences, ensuring that care is tailored to individual needs and preferences.
- Honesty and Integrity: Acting with honesty and integrity is paramount in all professional relationships. Pharmacists have a duty to tell the truth and act with conviction of conscience, avoiding discriminatory practices and behaviors that could impair professional judgment. This ethical standard ensures that pharmacists remain trustworthy and uphold the profession's integrity.
- Professional Competence: Maintaining professional competence is an ethical obligation for pharmacists. They must continually update their knowledge and skills to keep pace with advancements in medications, devices, and health information. This commitment to lifelong learning ensures that pharmacists provide the highest standard of care.
- Collaboration with Healthcare Professionals: Pharmacists are expected to respect the values and abilities of colleagues and other health professionals. When appropriate, they should seek consultations or refer patients to ensure comprehensive care. Acknowledging the diverse beliefs and values of healthcare team members fosters a collaborative environment conducive to optimal patient outcomes.

In practice, these ethical guidelines require pharmacists to integrate moral reasoning into their daily operations. This involves making informed decisions that align with ethical standards, engaging in open communication with patients and healthcare providers, and upholding the principles of beneficence, non-maleficence, justice, and autonomy in all aspects of their professional duties. By adhering to these ethical principles, hospital pharmacists play a crucial role in ensuring that patient care is not only effective but also morally sound, thereby reinforcing the trust placed in the healthcare system.

Hospital Pharmacy in a Global Context

Globally, hospital pharmacies are integrated into multidisciplinary teams, leveraging technology for precision and safety. Innovations include automated dispensing systems and pharmacogenomics. Hospital pharmacists play a pivotal role in healthcare systems worldwide, with

their responsibilities and practices varying across different countries due to diverse healthcare infrastructures, regulations, and cultural contexts.

- Global Variations in Roles and Responsibilities: While the core functions of hospital pharmacists—such as medication management, patient counseling, and collaboration with healthcare teams—are universally recognized, the extent and nature of these roles can differ significantly. In some regions, pharmacists are deeply involved in clinical decision-making and direct patient care, while in others, their duties may be more focused on the preparation and dispensing of medications. For instance, in certain healthcare systems, hospital pharmacists actively participate in multidisciplinary teams, contributing to medication governance, policy-making, and quality assurance processes related to medicine use and pharmacy services. They may also develop protocols for drug infusions or oral medications that require specific monitoring.
- Integration into Healthcare Teams: The degree to which hospital pharmacists are integrated into patient care teams varies globally. In many developed countries, pharmacists are essential members of the healthcare team, collaborating closely with physicians, nurses, and other healthcare professionals to optimize medication therapy and ensure patient safety. Their involvement can include reviewing medication orders, verifying their accuracy, and ensuring that patients receive the correct medications.
In contrast, in some developing nations, the integration of pharmacists into clinical teams is still evolving, with efforts underway to enhance their roles in direct patient care.
- Educational and Professional Development: The educational requirements and professional development opportunities for hospital pharmacists also differ internationally. In many countries, a Doctor of Pharmacy (Pharm.D.) degree is standard, often supplemented by residency training and specialization. Continuing education is crucial to maintain competence and adapt to advancements in pharmaceutical sciences. However, access to advanced training and professional development resources can be limited in certain regions, impacting the scope of practice for hospital pharmacists.
- Challenges and Opportunities: Hospital pharmacists worldwide face challenges such as resource constraints, varying levels of recognition within healthcare teams, and differences in regulatory frameworks. Despite these challenges, there are significant opportunities for hospital pharmacists to enhance patient care through involvement in medication safety initiatives, health policy development, and public health efforts. For example, pharmacists play a vital role in maintaining and promoting public health, with responsibilities that include participating in global, national, and community public health efforts.

While the foundational principles of hospital pharmacy are consistent globally, the specific roles, responsibilities, and operational practices of hospital pharmacists are influenced by regional healthcare contexts. Understanding these variations is essential for appreciating the global landscape of hospital pharmacy practice and for fostering international collaboration aimed at improving patient care outcomes.

Hospital Pharmacy in Bangladesh

In Bangladesh, hospital pharmacies face challenges like limited infrastructure and workforce gaps. Efforts to improve training and adopt global practices are ongoing. Hospital pharmacy practice in Bangladesh is evolving, with pharmacists increasingly recognized as integral members of the healthcare team. Their roles encompass medication management, patient counseling, and collaboration with other healthcare professionals to ensure safe and effective therapeutic outcomes.

- ✓ **Roles and Responsibilities:** Hospital pharmacists in Bangladesh are primarily involved in the procurement, storage, and dispensing of medications. They ensure that medications are available, stored under appropriate conditions, and dispensed accurately to patients. Additionally, pharmacists provide essential information to patients regarding proper medication use, potential side effects, and adherence to prescribed therapies. In some hospitals, pharmacists participate in clinical rounds, contributing to medication therapy management and decision-making processes.
- ✓ **Operational Challenges:** Despite their critical roles, hospital pharmacists in Bangladesh face several challenges. Resource constraints, lack of advanced technological infrastructure, and limited access to continuous professional development opportunities can impede the effective delivery of pharmaceutical services. Moreover, the pharmacist-to-patient ratio is often inadequate, leading to increased workloads and potential compromises in service quality.
- ✓ **Educational and Professional Development:** The educational framework for pharmacists in Bangladesh includes undergraduate and, in some cases, postgraduate training. However, there is a pressing need for specialized training in hospital and clinical pharmacy to equip pharmacists with the necessary skills for advanced practice roles. Continuous professional development programs are essential to keep pace with the rapidly evolving pharmaceutical landscape and to enhance the quality of patient care.
- ✓ **Integration into Healthcare Teams:** The integration of pharmacists into multidisciplinary healthcare teams is gradually improving in Bangladesh. Their involvement in patient care decisions, medication therapy management, and health education is becoming more prominent, contributing to improved patient outcomes. However, further efforts are needed to fully utilize pharmacists' expertise in clinical settings.

While hospital pharmacy practice in Bangladesh has made significant strides, ongoing efforts are required to address existing challenges. Enhancing educational programs, improving resource allocation, and fostering greater integration of pharmacists into healthcare teams are crucial steps toward optimizing the role of hospital pharmacists in Bangladesh's healthcare system. Global vs. Bangladeshi Hospital Pharmacy Practices. While global practices emphasize advanced technology and collaboration, Bangladeshi practices often struggle with resource constraints and policy implementation. Hospital pharmacy practices vary significantly between global standards and those observed in Bangladesh, influenced by differences in healthcare infrastructure, educational frameworks, and professional recognition.

Global Hospital Pharmacy Practices: Internationally, hospital pharmacists are integral to healthcare teams, engaging in direct patient care, medication therapy management, and clinical decision-making. Their roles encompass patient counseling, participation in medical rounds, and involvement in policy development to enhance medication safety and efficacy. Advanced healthcare systems support pharmacists with robust technological infrastructure and continuous professional development opportunities, enabling them to maintain high standards of practice.

Hospital Pharmacy Practices in Bangladesh: In Bangladesh, hospital pharmacy practice is still developing. Pharmacists' roles are often limited to the procurement, storage, and dispensing of medications, with minimal involvement in direct patient care or clinical decision-making. Challenges such as resource constraints, limited access to advanced training, and a lack of integration into healthcare teams hinder the expansion of pharmacists' roles. Recent initiatives aim to enhance pharmacy education and practice, but widespread implementation remains limited.

Table 2. Comparison table.: Global vs. Bangladeshi Hospital Pharmacy Practices

Aspect	Global Practices	Bangladeshi Practices
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Roles and Responsibilities	Involved in direct patient care, medication therapy management, and clinical decision-making.	Primarily focused on procurement, storage, and dispensing of medications.
Integration into Healthcare Teams	Integral members of multidisciplinary teams, participating in medical rounds and policy development.	Limited integration, with minimal involvement in clinical decision-making processes.
Educational Framework	Advanced degrees (e.g., Pharm.D.), residency training, and continuous professional development.	Pharmacy education with limited opportunities for specialized training and professional development.
Technological Infrastructure	Access to advanced technologies supporting medication management and patient care.	Limited technological resources, affecting the efficiency and scope of pharmacy services.
Professional Recognition	High level of professional recognition and autonomy within the healthcare system.	Emerging recognition, with ongoing efforts to enhance the role and status of pharmacists.

while global hospital pharmacy practices emphasize comprehensive involvement in patient care and clinical decision-making, practices in Bangladesh are currently more focused on the logistical aspects of medication management. Addressing challenges related to education, resource allocation, and professional integration is essential for advancing hospital pharmacy practice in Bangladesh to align more closely with global standards.

Hospital vs. Clinical vs. Community Pharmacist

Pharmacists play a crucial role in healthcare, ensuring the safe and effective use of medications. Their responsibilities vary significantly across different practice settings, notably hospital, clinical, and community pharmacies.

Hospital Pharmacists: Hospital pharmacists are integral members of healthcare teams, collaborating with physicians, nurses, and other professionals to optimize patient care. They are involved in medication therapy management, participate in clinical rounds, and provide expertise on drug interactions, dosing, and therapeutic alternatives. Their role extends to compounding medications, managing intravenous therapies, and ensuring the safe administration of complex treatments. Hospital pharmacists often work in specialized areas such as oncology, pediatrics, or critical care, requiring advanced training and residency programs.

Clinical Pharmacists: Clinical pharmacists focus on direct patient care within healthcare settings, including hospitals and clinics. They collaborate with healthcare teams to develop and monitor therapeutic plans, conduct medication reviews, and educate patients about their treatments. Clinical pharmacists are often involved in disease management programs, providing expertise in areas like diabetes, hypertension, and infectious diseases. Their role emphasizes patient-centered care, ensuring that medication regimens are tailored to individual needs and that patients understand their treatment plans.

Community Pharmacists: Community pharmacists operate in retail settings, such as drugstores and independent pharmacies, serving as accessible healthcare providers. They dispense medications, counsel patients on proper use, and provide information on over-the-counter products. Community pharmacists play a vital role in health promotion, offering services like immunizations, health screenings, and smoking cessation programs. They also manage medication therapy for chronic

conditions, ensuring adherence and monitoring for potential drug interactions. Their role is often more public-facing, requiring strong communication skills and a focus on customer service.

Hospital Pharmacist: Focuses on medication management for hospitalized patients.

Clinical Pharmacist: Works closely with healthcare teams, providing direct patient care.

Community Pharmacist: Operates in retail settings, addressing general medication needs.

While all pharmacists share a foundational knowledge of pharmacology and patient care, their roles diverge based on their practice settings. Hospital pharmacists are deeply integrated into clinical teams, focusing on complex patient care. Clinical pharmacists emphasize direct patient interactions within healthcare settings, managing therapeutic plans and patient education. Community pharmacists serve as accessible healthcare providers in retail settings, offering medication dispensing, health promotion, and patient counseling services.

Table 3. Comparison table: Hospital vs. Community Pharmacist

Aspect	Hospital Pharmacist	Clinical Pharmacist	Community Pharmacist
Primary Setting	Hospitals and healthcare facilities	Hospitals, clinics, and healthcare settings	Retail pharmacies, drugstores, and independent pharmacies
Key Responsibilities	Medication therapy management, clinical rounds participation, compounding, specialized care areas	Direct patient care, therapeutic plan development, medication reviews, patient education	Dispensing medications, patient counseling, health promotion, over-the-counter product information
Patient Interaction	Indirect, through healthcare teams	Direct, with patients and healthcare teams	Direct, with patients and the public
Specialization	Oncology, pediatrics, critical care, etc.	Disease management programs, chronic condition management	Health screenings, immunizations, smoking cessation programs
Educational Requirement	Doctor of Pharmacy (Pharm.D.), residency programs, specialized training	Doctor of Pharmacy (Pharm.D.), clinical training, board certifications in specialties	Doctor of Pharmacy (Pharm.D.), with opportunities for additional certifications in areas like immunization
Work Environment	Hospital wards, clinics, specialized units	Hospitals, clinics, patient homes	Retail pharmacy settings, community health centers
Regulatory Oversight	Hospital policies, healthcare regulations, accreditation standards	Healthcare facility policies, clinical practice guidelines	Pharmacy practice regulations, state and federal laws

Ensuring Medication Safety

Pharmacists play a pivotal role in ensuring the safe and effective use of medications across various practice settings, including hospital and community pharmacies. Each setting offers unique opportunities and challenges in medication safety. **Hospital Pharmacists:** In hospital settings, pharmacists are integral members of healthcare teams, collaborating with physicians, nurses, and other professionals to optimize patient care. They are involved in medication therapy management,

participate in clinical rounds, and provide expertise on drug interactions, dosing, and therapeutic alternatives. Their role extends to compounding medications, managing intravenous therapies, and ensuring the safe administration of complex treatments. Hospital pharmacists often work in specialized areas such as oncology, pediatrics, or critical care, requiring advanced training and residency programs. Use protocols, electronic systems, and clinical reviews to prevent errors and ensure proper medication use. Community Pharmacists: Community pharmacists operate in retail settings, such as drugstores and independent pharmacies, serving as accessible healthcare providers. They dispense medications, counsel patients on proper use, and provide information on over-the-counter products. Community pharmacists play a vital role in health promotion, offering services like immunizations, health screenings, and smoking cessation programs. They also manage medication therapy for chronic conditions, ensuring adherence and monitoring for potential drug interactions. Their role is often more public-facing, requiring strong communication skills and a focus on customer service. Ensure medication safety through patient counseling, adherence support, and detecting potential drug interactions. Pharmacists play a critical role in ensuring the safe and effective use of medications, both in hospital and community settings. Their responsibilities are multifaceted and essential to patient safety, from dispensing medications to educating patients about proper drug use and preventing medication errors. The roles and responsibilities of hospital and community pharmacists, though rooted in a shared goal of medication safety, differ based on the practice environment and patient needs.

Hospital Pharmacists: Ensuring Safe Medication in Complex Environments

Hospital pharmacists work within multidisciplinary teams in complex healthcare settings, including hospitals and specialized care units. They are directly involved in medication therapy management (MTM), which includes evaluating the appropriateness of medications, ensuring correct dosing, and preventing harmful drug interactions. Hospital pharmacists regularly participate in clinical rounds with physicians and other healthcare providers, making therapeutic recommendations based on a patient's clinical condition (Babu et al., 2024); (Studer et al., 2023). They also oversee the preparation and dispensing of intravenous medications, ensuring proper formulation and safety. In addition to these core responsibilities, hospital pharmacists are crucial in managing high-risk medications, including chemotherapy agents, anticoagulants, and immunosuppressive drugs. Their expertise is integral in minimizing adverse drug reactions, especially in vulnerable patient populations such as those in intensive care units or pediatric wards. They also help optimize pharmacotherapy for chronic diseases and collaborate on medication management strategies, which is vital for patient outcomes. Furthermore, hospital pharmacists are involved in quality improvement initiatives to reduce medication errors and enhance patient safety. These pharmacists are trained to address medication-related problems and provide education to both patients and healthcare teams to improve compliance and treatment outcomes.

Community Pharmacists: Ensuring Safe Medication in Accessible Settings

Community pharmacists, in contrast, typically work in retail pharmacies, drugstores, and independent pharmacy settings. Their role extends beyond dispensing medications to include patient counseling, health screening, and wellness promotion. Community pharmacists ensure safe medication use by educating patients about proper dosing, potential side effects, and drug interactions. They also provide advice on over-the-counter medications and monitor patients for adverse reactions, particularly for those managing chronic conditions like diabetes, hypertension, and asthma (DeCarolis et al., 2019). One of the primary roles of community pharmacists in medication safety is their involvement in medication therapy management (MTM) programs, where they review patients' prescriptions for potential interactions and duplicate therapies (Pathak et al., 2023); (Anderson & Marrs, 2018). They also assess adherence to prescribed treatments, which is crucial in preventing drug misuse and ensuring that patients follow their treatment regimens correctly. Community pharmacists frequently act as the first point of contact for patients seeking advice on their medications, making their role in the healthcare system essential in preventing medication-related problems (Saiyed et al., 2017).

Additionally, community pharmacists have an important role in public health, offering immunizations, smoking cessation programs, and conducting health screenings for various conditions, such as hypertension or high cholesterol. By promoting healthy lifestyle choices and providing education on disease prevention, community pharmacists help reduce the risk of medication errors and improve the overall health outcomes of patients.

Table 4. Community pharmacists help reduce the risk of medication errors and improve the overall health outcomes of patients

Aspect	Hospital Pharmacists	Community Pharmacist
Primary Setting	Hospitals, specialized care units, clinics	Retail pharmacies, drugstores, independent pharmacies
Patient Interaction	Indirect, via healthcare teams and medication therapy management	Direct, with patients and the public for medication counseling and health advice
Key Responsibilities	Medication therapy management, drug interactions, intravenous medications, patient care	Dispensing medications, patient counseling, medication therapy management, health promotion
Specialization	Oncology, pediatrics, critical care, pain management, emergency care	Chronic disease management, health screenings, immunizations, over-the-counter advice
Regulatory Oversight	Hospital and healthcare regulations, safety standards, accreditation	State and federal pharmacy regulations, professional standards
Educational Requirements	Doctor of Pharmacy (Pharm.D.), residency programs, specialized training	Doctor of Pharmacy (Pharm.D.), additional certifications for specialized areas
Role in Medication safety	Direct involvement in clinical rounds, drug management for hospitalized patients	Ensuring safe medication use in community settings, preventing misuse and non-adherence

Both hospital and community pharmacists play vital roles in ensuring the safe use of medications. Hospital pharmacists contribute through their expertise in complex therapeutic regimens and clinical care, while community pharmacists ensure safe medication practices in accessible environments. Both settings are essential for optimizing patient outcomes, preventing medication errors, and promoting public health. The distinct roles of these pharmacists highlight the diversity of their contributions to medication safety across healthcare systems.

Critical Analysis

Strengths of Global Practices:

- Advanced integration of technology (e.g., automated dispensing systems).
- Robust training programs and continuous professional development.
- Strong regulatory frameworks ensuring high-quality practices.

Weaknesses in Bangladesh:

- Resource constraints leading to fragmented practices.
- Inadequate training and reliance on underqualified staff in community pharmacies.

- Limited involvement of hospital pharmacists in clinical decision-making.

Opportunities for Improvement:

- ❖ Adoption of telepharmacy and advanced clinical roles.
- ❖ Policy reforms to strengthen regulatory enforcement and training standards.
- ❖ Collaboration between community and hospital pharmacists to ensure continuity of care.

Challenges:

- Economic pressures and workforce shortages in Bangladesh.
- Resistance to change in traditional practices and lack of infrastructure.

Critical Discussion

The study underscores the critical role pharmacists play in ensuring medication safety across healthcare systems. It highlights that while global practices set high benchmarks, there is a pressing need for localized adaptations to address unique challenges. In Bangladesh, fragmented systems and insufficient training hinder the effectiveness of pharmacy operations, particularly in community settings. However, the potential for growth is significant. Integrating global best practices, such as telepharmacy and comprehensive medication therapy management, could revolutionize pharmacy practices in Bangladesh. Policy reforms focusing on education, regulation, and resource allocation are essential. Collaboration between community and hospital pharmacists emerges as a recurring theme, emphasizing the need for a unified approach to medication safety. By addressing current gaps and leveraging emerging opportunities, pharmacists in Bangladesh can significantly contribute to enhancing patient care and public health outcomes.

Conclusion

Both hospital and community pharmacists play vital roles in ensuring the safe and effective use of medications, each within their distinct practice environments. Hospital pharmacists are deeply integrated into clinical teams, focusing on complex patient care, medication therapy management, and the prevention of adverse drug events. They collaborate with healthcare professionals to optimize therapeutic outcomes, particularly in specialized areas such as oncology, pediatrics, and critical care. Their involvement in clinical rounds and direct patient care settings allows for real-time assessment and intervention, which is crucial in managing high-risk medications and complex treatment regimens. Conversely, community pharmacists serve as accessible healthcare providers in retail settings, offering medication dispensing, patient counseling, and health promotion services. They play a crucial role in ensuring medication safety by educating patients on proper medication use, potential side effects, and drug interactions. Community pharmacists also engage in health promotion activities, such as immunizations and health screenings, thereby contributing to public health and the prevention of medication-related problems. The collaboration between hospital and community pharmacists is essential for a comprehensive approach to medication safety. By working together, they can ensure continuity of care, optimize therapeutic outcomes, and enhance patient safety across the healthcare continuum. This collaborative effort is particularly important in managing patients with complex medication regimens, as it allows for the sharing of critical information and the development of coordinated care plans. In conclusion, the distinct yet complementary roles of hospital and community pharmacists are integral to the safe and effective use of medications. Their combined efforts in medication therapy management, patient education, and health promotion are essential in preventing medication errors, optimizing therapeutic outcomes, and enhancing patient safety across diverse healthcare settings. Medication safety in community and hospital pharmacy is crucial for enhancing healthcare outcomes. While global practices set benchmarks, countries like Bangladesh must address challenges through policy reforms and professional development. Both sectors must prioritize patient-centered care to achieve optimal medication safety.

Conflicts of Interest

The authors declare no conflict of interest

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