

EXPLORING THE PERCEPTION OF HEALTHCARE PROFESSIONALS REGARDING CLINICAL PHARMACY SERVICES IN A TERTIARY CARE HOSPITAL OF KARACHI

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Abstract

Background: Clinical pharmacy services (CPS) have been recognized around the world as playing a vital role in the enhancement of patient safety; however, this role is not widely exploited in low- and middle-income countries (LMICs) including Pakistan, primarily because of systemic and traditional challenges. The study aims to explore the perceptions of healthcare professionals (HCPs) about clinical significance, organizational contribution, obstacles, challenges, and prospects for the expansion of CPS in a tertiary care hospital of Karachi.

Methodology: This was a qualitative study with a multi-disciplinary sample of nine key stakeholders selected through purposive sampling, based on an interpretivist-constructivist paradigm. Semi-structured face-to-face interviews were used to collect primary data on medication reviews, ward rounds and barriers to integration. Braun and Clarke's six phase framework were used to analyze data in the process of Reflexive Thematic Analysis (RTA).

Findings: The data showed a change in professional identity where HCPs consider pharmacists to be not only dispensers but critical clinical partners and cognitive process optimizers who can cut medical workloads by almost 50%. Pharmacists are essential back-up colleagues who alleviate the cognitive strain for physicians with regard to possible prescribing errors. CPS is an economically focused resource steward: cost-effective conversions to oral formulations are performed and therapy is managed. But fragility of the system, as reflected by the extreme shortage of clinical pharmacists and the ego factor, or cultural resistance, continue to limit integration.

Conclusions: HCPs see CPS as an essential clinical requirement to guarantee therapeutic accuracy and operational efficiency. To achieve its full potential in Pakistan, specialized professionals, interprofessional training and role definition within the institutions need to be increased.

INTRODUCTION

Clinical pharmacy is a specialized area of health sciences aimed at enhancing the use of drugs to achieve optimum therapeutic benefit and improve patient outcome by providing patient-centered care (Jebara et al., 2021; Mendes et al., 2022). The

discipline encourages the safe, rational and effective use of medicines and is involved in the prevention of disease, health promotion and overall quality of health-care services. Pharmacists have shifted from their traditional duties of procuring and dispensing drugs to active

involvement in a multi-disciplinary health care team over, the last few decades (Atif et al., 2020; Khan et al., 2020). Medication therapy management, patient counselling, therapeutic drug monitoring, antimicrobial stewardship and chronic disease management have been part of clinical pharmacists' duties in many developed countries. In other health care systems pharmacists have also been granted prescribing authority and greater clinical roles (Almazrou et al., 2015).

The growth and development of clinical pharmacy services (CPS) in the global area has been linked to positive medication safety outcomes, reduced adverse drug reactions, reduced health care costs, and improved patient outcomes (Althagafi, 2025; Guo et al., 2020). Studies conducted in developed health care have found that clinical pharmacists' participation in patient care teams leads to better interdisciplinary working and a reduction in the incidence of medication errors (Jebara et al., 2021; Omar et al., 2020). International organizations such as the World Health Organization (WHO) and the International Pharmaceutical Federation (FIP) also acknowledge the importance of pharmaceutical care as a part of the healthcare care systems in the world.

Even with these developments, the adoption of CPS is still not widespread in many low and middle-income countries (LMICs), such as Pakistan (Atif et al., 2020; Khan et al., 2020). Irrational prescribing, polypharmacy, medication-related complications, low availability of healthcare resources, and inadequate collaboration between the various health care cadres are problems that the healthcare system in Pakistan struggles with (Atif et al., 2022). With the aim of modernizing Pharmacy education and improving the provision of pharmaceutical care, the five-year bachelors degree (Doctor of Pharmacy) PharmD was introduced in Pakistan in 2004. In 2012 Drug Regulatory Authority of Pakistan (DRAP) Act 2012 was introduced to acknowledge the enlarged service of the pharmacy. However, the clinical practice and contribution of clinical pharmacist to the patient care in many

health care organizations is not well established (Khan et al., 2020).

Pharmacists' role in Pakistan is still limited to procurement, inventory management, and dispensing, instead of direct involvement in patient care (Atif et al., 2020). This therefore limits their role in medication review, patient counselling, and therapeutic decision making, due to various reasons including inadequate staffing, low institutional support, roles not well defined, and lack of inter-professional collaboration (Atif et al., 2022; Khan et al., 2020). Both problems persist and hinder the effective implementation of clinical pharmacy services (CPS) in hospital.

In the largest metropolitan city of Pakistan, Karachi, there are a number of tertiary care hospitals with a high volume of complex patient cases and a high burden of chronic diseases and complications related to polypharmacy. These facts underscore the critical need for effective medication management and interdisciplinary collaboration—exactly the type of care that CPS can help provide. However, there is limited evidence regarding healthcare professionals' perception of clinical pharmacy service in Karachi, especially regarding qualitative aspects of the service (Arain et al., 2025).

It is important to explore the perceptions of the healthcare professionals, including doctors, nurses, pharmacists and other healthcare team members, because attitudes and experiences can have a strong influence on whether CPS is implemented and accepted successfully or not (AlDehemi & Khashaba, 2017; Omar et al., 2020). With positive collaboration, patient safety and healthcare quality can be better. On the other hand, communication issues and unclear roles may limit the extent to which pharmacists can be involved in healthcare teams (Almazrou et al., 2015).

Hence, this study is designed to explore the perceptions of healthcare professionals about the organizational value, clinical impact, barriers and future opportunities of clinical pharmacy services in a tertiary care hospital of Karachi. The results can contribute to better interdisciplinary collaboration, enhance the provision of patient-

centred pharmaceutical care and contribute to continued growth of clinical pharmacy services in Pakistan.

Problem Statement

In Pakistan, specifically within the complex healthcare environment of Karachi, clinical pharmacy remains an underutilized discipline that is often restricted to traditional procurement and dispensing tasks (Atif et al., 2020). Despite the transition to the five-year PharmD degree and the legal framework provided by the DRAP Act 2012, pharmacists are rarely integrated into the direct patient care pathways of tertiary care hospitals (Khan et al., 2020). This underutilization contributes to systemic inefficiencies, including high rates of medication errors, unnecessary healthcare expenses, and a lack of optimized pharmacotherapy management (Guo et al., 2020; Althagafi, 2025). A significant barrier to progress is the paucity of qualitative research that captures the lived experiences and perceptions of the healthcare professionals (physicians, nurses, and administrators) who must collaborate with pharmacists (Arain et al., 2025). Without understanding these stakeholder interpretations, it is difficult to design effective organizational strategies or implement national policies that would transform the pharmacist from a "dispenser" into a strategic clinical partner.

Literature Review

Clinical pharmacy has shifted from a product-driven clinical practice involved in acquiring the drugs and dispensing them to a patient-driven health science practice, exploring the roles of pharmacists as a key member of the integrated healthcare team model in a patient-centric care environment (Mendes et al., 2022). According to the American College of Clinical Pharmacy (ACCP), the discipline is the "science and practice of rational medication use, in which the pharmacist can deliver care and optimize medication use in the context of promoting health, wellness, and disease prevention. This phenomenon started in the 1960s in the USA and has now spread worldwide in response to the

increasing need for safe and quality medicine use. In developed healthcare systems, like the United Kingdom, these services have evolved to offer more advanced services such as the independent prescribing role and extensive therapeutic drug monitoring (Jebara et al., 2021). The International Pharmaceutical Federation (FIP) and the World Health Organization (WHO) support the systematic use of these outcome-oriented services to benefit the public health. Interprofessional collaboration and acceptance of expanded pharmacists' role by physicians are essential components of the success of clinical pharmacy services (CPS) (Almazrou et al., 2015; Omar et al., 2020). It is shown that institutions that do not utilize pharmacists in their extended roles of clinical pharmacy practice generally tend to experience rather higher number of medication errors, adverse medication events, prescribing errors and overall suboptimal results of therapy (Ahmed et al., 2018). Numerous reports in the literature suggest that physicians perceive pharmacists as knowledgeable "drug-therapy experts," and welcome consultative and educational services (AlDehemi & Khashaba, 2017). There is, however, a strong "complex relationship" as physicians appreciate support in managing drug interactions and side effects, but they may be hesitant to let the pharmacist make independent decisions (Almazrou et al., 2015). Physicians in Saudi Arabia consider pharmacists as an essential component of the health care team but have doubts about their importance as patient educators (Almazrou et al., 2015). In Kuwait and Jordan, too, physicians are more at ease with traditional support from pharmacists than with pharmacists becoming more involved in clinical rounds and/or independent prescribing. This opposition is often said to stem from a "culture of medical dominance," in which prescribing is seen as a matter strictly for the physician's competence. Pharmacist-assisted interventions have been shown to have a clinical effect, especially when identifying and resolving drug-related problems (DRPs) (Althagafi, 2025). In a retrospective study in Saudi Arabia, more than 77% of the pharmacist interventions were due to dosage errors,

emphasizing the pharmacist as an important safety net (Althagafi, 2025). Such interventions have been proven to decrease mortality and morbidity in chronic disease such as heart failure and also enable substantial cost savings by making better use of resources (Guo et al., 2020). Tertiary health services can also benefit from clinical pharmacists in improving operational efficiency, for example, in the management of complex chemotherapy regimens, the adjustment of the dose to accommodate renal or pediatric patients, and facilitating Intravenous-to-oral (IV to PO) therapy conversions (Omar et al., 2020). The study in China suggests that the rational drug use software is a vital tool for clinical practice in the era of information technology, which has helped to optimize clinical treatment and clinical outcomes, and it is also a standard tool for clinical pharmacists to practice (Guo et al., 2020).

There are unique and formidable implementation challenges to CPS in low- and middle-income countries (LMICs) (Atif et al., 2020). One of the main challenges is the "limited interest of regulatory authorities" and the absence of clear national policies in defining and securing clinical pharmacist's role (Atif et al., 2020). The healthcare system is extremely strained and lacks specialized pharmacy management cadre in Pakistan (Khan et al., 2020). The government has introduced a 5-year Doctor of Pharmacy (PharmD) degree in 2004 and a DRAP Act in 2012 to accept advanced roles, but it has been just beginning to implement these degrees (Atif et al., 2020). Some of the specific challenges faced in Pakistan are renting out of pharmacy licenses to non-qualified owners, a lack of institutional support for pharmacists to work independently (Atif et al., 2020). In addition, there are limitations on how pharmacists are perceived as healthcare providers as opposed to "unqualified dispensers" (Khan et al., 2020).

Qualitative research has started recently using the concepts of organizational theories to explain the value of CPS (Arain et al., 2025). According to the Resource-Based View (RBV), the pharmacist is a strategic resource whose unique knowledge and skills can provide a competitive advantage in hospital performance by reducing costs and

optimizing clinical performance (Arain et al., 2025). In contrast, Scientific Management Theory (SMT) focuses on standardization and optimization of the workflow and places a greater emphasis on interdepartmental communication and reducing medicinal wastage, with the pharmacist being called the 'process optimizer' that optimizes institutional efficiency (Arain et al., 2025). The Consolidated Framework for Implementation Research (CFIR) has been used in Qatar to map the success of new clinical models, with the inner setting readiness and individual motivation identified as key facilitators (Jebara et al., 2021).

The change from Bachelor of Pharmacy (BPharm) to PharmD was planned to provide clinical skills to the pharmacists for direct patient care (Khan et al., 2020). But, there still remains an issue of gap between academic qualification and clinical practice readiness. Physicians have also attributed to their reluctance to delegate clinical activities to pharmacists "questionable competency" and non-specialized training (Almazrou et al., 2015). During internship, most of the PharmD graduates still get routine clinical exposure which is inadequate in nature, which is why they lack confidence and inter-professional communication skills in Pakistan (Atif et al., 2022). It has been suggested that in order to keep the clinical practice standards high, Pharmacy schools need to be affiliated directly with hospitals, as in the case of medical schools, and have residency programs (PGY system) (Khan et al., 2020).

Limitations of Existing Literature

Existing studies offer some knowledge of HCP perceptions, but there are some limitations:

1. **Methodological Restraints:** A large portion of the current literature was based on cross-sectional, self-completed questionnaires that may lead to social desirability bias and the depth and nuance of professional experiences can be captured from qualitative methods.

2. **Lack of Generalizability:** Many studies are done in single treatment centers or specific areas of the city (e.g., Riyadh or Qatar) which may not be representative of the varied private and

public health care environment of Karachi or other LMIC settings.

3. **Specialized Service Gaps:** There is limited research in specialized tertiary services other than medicine like oncology clinical pharmacy, sterile IV compounding and pain management in Pakistan.

4. **Temporal Limits:** Most studies are "snapshots" in time, without longitudinal reporting of the changes in the perceptions of the HCPs and inter-professional relationships as the CPS models develop over years of implementation.

5. **Lack of Patient's Perspectives:** Much of the literature only addresses the HCPs, and the ultimate end user of the services – the patient – is largely ignored in the research on the quality of pharmacy services and impacts.

Significance of Study

The study is extremely pertinent as it addresses a key gap in the qualitative literature in Pakistan on the value and clinical benefits of clinical pharmacy services (CPS) in Pakistan (Arain et al., 2025). The study documents context-specific knowledge gained from a major metropolitan city like Karachi, thus offering a guideline for the organizational strategies and policy frameworks needed to formalize the role of pharmacists, including the implementation of the DRAP Act 2012 (Atif et al., 2020). Moreover, the study employ the Resource Based View (RBV) and Scientific Management Theory (SMT) to show the role of pharmacists, beyond being merely support staff, as strategic, irreplaceable resources that can improve the performance and safety of patients in resource constrained environment (Arain et al., 2025).

Methodology

Research Philosophy

In accordance with Saunders' Research Onion (Saunders et al., 2019), this study adopts an interpretivist-constructivist philosophy. As emphasized by Creswell and Creswell (2017), this paradigm posits that individuals seek an understanding of the world in which they live and

work, developing subjective meanings of their experiences. In this study, the professional roles, collaborative dynamics, and institutional realities of healthcare professionals (HCPs) are viewed as socially constructed phenomena that must be interpreted through the participants' own lenses rather than measured objectively.

Approach to Theory Development

The study utilizes an inductive approach. Rather than testing an existing hypothesis or a deductive theoretical framework, this research begins with specific empirical observations—the lived experiences of HCPs regarding clinical pharmacy services—to identify broader patterns, categories, and qualitative themes (Saunders et al., 2019).

Research Strategy

The chosen research strategy is a Qualitative Study. Following Creswell's typologies, this strategy allows for an in-depth, context-sensitive exploration of a contemporary phenomenon within its real-life clinical setting. It focuses on capturing the depth, nuance, and rich descriptions of professional interactions and systemic barriers that quantitative strategies cannot capture (Creswell and Creswell, 2017).

Research Choice

This study employs a qualitative mono-method, relying exclusively on qualitative data collection and analysis procedures (Saunders et al., 2019). This singular focus ensures methodological purity, allowing the research to stay deeply aligned with the interpretive paradigm without the divergent epistemological assumptions of mixed-methods designs (Silverman, 2020).

Time Horizon

The time horizon for this research is cross-sectional. In accordance with Saunders et al. (2019), data collection captures a snapshot of the experiences, attitudes, and professional realities of HCPs within the selected tertiary care hospital at a single point in time, rather than tracking changes over an extended longitudinal period.

Data Collection and Analysis

Research Setting: The study was conducted in a large tertiary care hospital in Karachi, which provides a complex, multi-disciplinary environment essential for studying healthcare integration.

Sampling and Participants: Following Creswell's (2017) qualitative sampling principles, purposive sampling was deployed to intentionally select stakeholders who could best inform the research question. A sample of nine participants was selected to ensure a diverse cross-section of multi-disciplinary perspectives while maintaining qualitative depth.

Data Collection: Primary data was gathered through semi-structured, face-to-face interviews. An interview guide was designed around key operational domains—including medication reviews, multi-disciplinary ward rounds, and barriers to integration—while allowing the flexibility to pursue unexpected lines of inquiry.

Data Analysis: The qualitative data was analyzed using Reflexive Thematic Analysis (RTA) (Braun & Clarke, 2022). This involved an iterative process of data familiarization, coding, and theme development, treating the researchers' clinical insights as interpretive tools.

Methodological Rigor and Trustworthiness

To satisfy Creswell's criteria for qualitative validation and Saunders' standards for data quality, trustworthiness is established through:

Credibility & Confirmability: Maintained via a systematic audit trail that documents raw data, coding structures, and analytical choices.

Dependability: Enhanced through collaborative reflexive dialogues among the research team to critically challenge and enrich the thematic interpretations, ensuring the findings are deeply grounded in the data.

Results

Characteristics of Participants

The baseline characteristics of the HCPs interviewed for the study are presented in the table below:

Participant ID	Professional Role / Specialty	Experience
Dr. MF	Manager of Clinical Operations / Nephrologist	8 years
Dr. NA	Second-Year Resident, General Surgery / Orthopedics	2 years
Dr. SAH	Final Year Resident, General Surgery	4.5 years
Dr. ZA	Consultant Hematologist	15 years
Dr. MH	Hematologist / Oncologist (Pediatric Oncology)	8 years
Dr. AJ	Clinical Consultant in Orthopedic Surgery	10+ years
Dr. MB	Registrar, Department of Orthopedics	5 years
HS	Senior Clinical Dietitian	7 years
Dr. SB	Registrar, Department of Urology	5 years

Themes

Themes are presented that discuss the lived and lived-in experience of clinical pharmacy services (CPS) as seen by the healthcare professionals (HCPs) in the tertiary care hospital in Karachi.

Theme 1: Evolution of Professional Identity – Change from 'Dispenser' to 'Clinical Partner'

- **Point:** Pharmacists' identity changes dramatically for HCPs, who perceive them as

active medical partners and not as distant medication managers.

- **Evidence:** Dr. NA reflects on this transition, stating, "Previously, I viewed a pharmacist simply as someone who knew generic drug names... Now, I see their presence in rounds as vital". Dr. MF echoes this, noting a move from a role "centered within the pharmacy" to a model with a "direct presence at the bedside". Dr. MB further describes them as an

"approachable and essential part of the multidisciplinary team".

- **Explanation:** Through a thematic lens, this is a fundamental change of meaning for the role of the pharmacist in a hospital context. They are no longer seen as "clerks in a pharmacy basement," but as "therapeutic experts" who are an important "liaison" between departments. This change helps to create a culture of respectful professional interaction and care and co-ordination of services.

- **Link:** This is an identity reconstruction that is crucial for the move towards modern, patient-oriented models of clinical care.

Theme 2: The "Safety Net" as Perceived Experience of Security

- **Point:** CPS is viewed as a key safety barrier that helps to give HCPs a feeling of safety and buffers the psychological toll of a possible medical error.

- **Evidence:** Dr. ZA explains that having a pharmacist present "reduces our mental burden," as doctors previously "worried if a prescribed dose was exactly right or if a drug-related point had been missed". Dr. MB notes that when collaborating with them, "the patient is in much safer hands". Dr. SB describes this role as a "critical safety net" that ensures optimal dosing for complex patients.

- **Explanation:** For the surgeon or physician, the pharmacist offers an "independent workup" and "vigilance" acting as a system of checks and balances. This holds true especially in high-stress situations where physicians are not "well-versed in complex drug dosages". The pharmacist's role is viewed as a shield for the patient and the doctor.

- **Link:** Ultimately, this theme makes it clear that CPS is considered a vital clinical necessity to achieve therapeutic precision.

Theme 3: Reduction of Cognitive Workload and Transformation of Routine Practice

- **Point:** HCPs see CPS as a tool that can significantly enhance their day-to-day workflow and alleviate their administrative burden.

- **Evidence:** Dr. MH explicitly states that the pharmacist's support "reduces the physician's workload by nearly 50%" because they handle

"detailed clinical notes, dosage mentions, and progressive notes". Dr. AJ highlights the efficiency gain, noting that bedside pharmacists provide "summarized, precise, and patient-specific information," which "saves us significant time" compared to consulting multiple references.

- **Explanation:** Clinical pharmacist as a "process optimizer" and a "helping hand". Physicians can dedicate more time to general management and surgery and more complex tasks such as "IV-to-oral conversions" or "nephrotoxic doses" can be delegated to others. The synergy leads to a more efficient and effective clinical setting.

- **Link:** The efficiency of the entire multi-disciplinary team is increased, resulting in an improvement in the efficiency of hospital operations.

Theme 4: Navigating the "Ego Factor" and General Misconceptions of Society

- **Point:** Although there are obvious advantages, HCPs view the merger of CPS as a process that is constrained by professional hierarchy and ongoing social stigma.

- **Evidence:** Dr. MF identifies an "ego factor" where senior consultants may feel "challenged when a younger, unexperienced pharmacist suggests a change in therapy". Dr. NA observes a hierarchy where some do not like "being told what to do by non-physicians". Additionally, Dr. ZA laments a "lack of professional and social acceptance," where the public still views them merely as "dispensers". Dr. MB states that, "physicians should not be idolized in order for non-physician healthcare professionals to be accepted in team".

- **Explanation:** HCPs feel these are a "lag" in the development of the healthcare system in comparison to the international standards. The issue of interpretation is of reconciling the advanced role of clinical practice for the pharmacist with the traditional and hierarchical medical structures. This would need proactive education to change these ingrained perceptions.

- **Link:** Overcoming these cultural and hierarchal barriers by way of leadership and 'one-on-one communication' is essential for the successful integration of clinical pharmacy.

Theme 5: Economic Stewardship and Institutional Efficiency

- **Point:** HCPs will see clinical pharmacy services (CPS) as an essential element of institutional cost-effectiveness, process optimization and patient flow.

- **Evidence:** Dr. MF notes that pharmacists facilitate the conversion of medications from intravenous (IV) to oral forms, stating that switching a common medication like paracetamol can result in "significant cost savings for both the patient and the institution". Dr. AJ highlights a case where a dose correction "protected the patient from a potential adverse reaction but also saved money, as the medication was quite costly". Furthermore, CPS is interpreted as a means to achieve a "reduced length of hospital stay" through therapy optimization.

- **Explanation:** For these HCPs, the concept of CPS is not merely limited to the clinical aspects but encompasses the hospital management side of things. The pharmacist is perceived as a "steward" of the resources and the one that makes sure that therapy is not only clinically effective, but also "economical". Pharmacists avoid costly mistakes, and waste of time in treatment by de-escalation, maximizing the institutional "bottom line".

- **Link:** This economic impact further reinforces the pharmacist's strategic role as a resource to help ensure sustainability of tertiary care operations.

Theme 6: Academic Empowerment and Knowledge Liaison

- **Point:** Clinical pharmacist refers to a key educator who helps to fill the knowledge gap between complex pharmacology and surgical or specialized practice.

- **Evidence:** Dr. SB notes that pharmacists facilitate "academic sessions on topics such as antibiotics, IV fluids, electrolytes, and nutrition," which she finds "incredibly helpful because surgeons often overlook these specific pharmacological details due to their focus on surgical procedures". Dr. AJ suggests they should take a larger role in "disseminating drug information through seminars and workshops for the

entire healthcare team". Dr. SAH adds that they are essential for junior residents who "often struggle with dosing when they first start".

- **Explanation:** HCPs feel like they are growing professionally when they interact with pharmacists. The pharmacist is viewed as a 'knowledge liaison', giving surgeons and residents 'evidence-based literature' and 'summarized, precise and patient-specific information' that they do not have the time to research.

- **Link:** This learning collaboration or partnership builds the competency of the multi-disciplinary team and allows patient care to be based on the latest clinical evidence, enhancing patient safety and therapeutic outcomes.

Theme 7: Bridging Socioeconomic and Supply Chain Gaps

- **Point:** Pharmacists have extensive experience in the pharmacy setting and are critical in ensuring the continuity of patient care by understanding what it takes to provide the medication to the patient and how it will affect their budget.

- **Evidence:** Dr. SB describes the pharmacist as a "vital bridge to the purchase department and warehouse to arrange non-formulary drugs for patients who cannot afford to purchase them externally," ensuring that "financial barriers do not impede treatment". Dr. AJ observes that they treat patients from a "vast range of socioeconomic backgrounds" and bridge communication gaps through "patient counseling and medication reconciliation".

- **Explanation:** The pharmacist's role is interpreted in this context as a "social advocate". Not only are they dealing with drugs, they're also dealing with the availability of drugs for a wide range of patients, many of whom are poor. By coordinating with clinical operations and supply chains, they ensure that "administrative hurdles do not impact the patient's treatment".

- **Link:** In a resource-constrained environment such as Karachi, the pharmacist's role as an advocate can make the difference between a patient obtaining a lifesaving drug or not.

Theme 8: Fragility of System –The Struggle for Manpower and Specialization

- **Point:** HCPs are witnessing the current situation in clinical pharmacy as a very valuable service, but quite fragile because of a critical lack of specialized staff.
- **Evidence:** Dr. MF highlights that a small team of "about ten clinical pharmacists is stretched across nearly 27 specialties," necessitating a move toward a "specialty-specific model". Dr. SAH emphasizes that "one or two pharmacists are not enough to cover the workload" and advocates for a larger team so they can be a "permanent part of the daily rounds for every patient". HS identifies the major hurdle as "limited staffing relative to high bed capacity and high patient turnover".
- **Explanation:** The current model is perceived as "stretched" by HCPs and they are looking for the opportunity to "deepen the impact" of the service in departments such as Nephrology, Oncology, Surgery, etc. by employing "dedicated pharmacists".
- **Link:** This theme highlights the need to ensure institutional management focus on increasing human resources capacity and the development of specialisms for the clinical pharmacy to become a "backbone" within the institution rather than a supportive role.

Discussion

The findings of this study provide a rich account of clinical pharmacy's impact in Karachi. The data indicates that HCPs have two common perspectives on the clinical pharmacist: the Resource Based View (RBV) and Scientific Management Theory (SMT) (Arain et al., 2025). From the RBV perspective, pharmacists are those who possess an expertise that can detect key errors that physicians may fail to notice during stressful situations, such as a Vancomycin overdose or Warfarin irrationality. They are not just useful – they are said to be "indispensable" for the safety of an institution. The interpretation was consistent with the literature from Europe and the rest of the world, which considers the clinical pharmacist to be a therapeutic expert whose knowledge plays a significant role in improving patient outcomes

and medication safety (Jebara et al., 2021; Omar et al., 2020). The findings also reflect those of Althagafi (2025) in Saudi Arabia, who demonstrated that the pharmacist was an essential safety measure for detecting and resolving dosage-related issues before they became harmful for the patient, highlighting the pharmacist's critical role in the provision of care in tertiary health care systems.

The stories shared by the participants illustrates that pharmacists are becoming more than just medication dispensers; they are clinically integrated healthcare professionals whose knowledge and skills are directly linked to improving patient outcomes and optimizing therapy. It mirrors the global shift of the practice of pharmacy from a product-driven to a patient-focused endeavor (Mendes et al., 2022). The importance of the pharmacist's role with respect to inappropriate therapies, dose optimization and the monitoring of potential drug-related toxicities, particularly in specific disciplines such as oncology and nephrology, was repeatedly stressed. The results reported here are consistent with those of the studies conducted in Qatar and China, where healthcare professionals agreed that the pharmacists had enhanced treatment plans, optimized medication use and strengthened interdisciplinary care delivery (Guo et al., 2020; Omar et al., 2020). Hence, the interpretive narratives from Karachi indicate that pharmacists are increasingly involved in the clinical decision-making process of the tertiary hospital, especially when it comes to highly complex pharmacotherapy.

One significant discovery is how health care workers envision the pharmacist as a "check and balance system" in the hospital. The pharmacist's involvement was perceived by the participants as an additional safeguard against medical error, particularly in environments where doctors may feel pressured by time constraints to make quick decisions and by the volume of patients. This perception is similar to that observed in other LMICs, where pharmacists have been seen as a protective measure for irrational prescription and medication complications (Atif et al., 2020; Atif et

al., 2022). This safety role seems more critical in tertiary care settings in Karachi due to the complexity of the patients and the use of multiple medications (polypharmacy) and the burden of the work flow on the health care teams. Institutional reliability and risk reduction, therefore, becomes a mechanism for pharmacist independent review of therapies.

The results also indicate that the pharmacist's role is not limited to the administration of medicines, but also has a positive impact on the overall efficiency of the organization. At the same time, the results are consistent with SMT as cited by almost all respondents (Arain et al., 2025) of the process optimization. The estimated "nearly 50% workload reduction" reported by oncologists, and the "significant time savings" noted by surgeons, are testament to the ability of pharmacists to enhance the workflow in hospitals. Pharmacists can manage the "detailed clinical notes" and "dose adjustments", while doctors can concentrate on their key "surgical expertise" or "disease progression". Such a functional division of labor improves tertiary care hospital overall efficiency. The conclusions are in support of the Scientific Management Theory which focuses on optimizing workflow, specializing tasks and standardizing working techniques to enhance the institutional performance (Arain et al., 2025).

The experiences reported by the participants suggest that pharmacists are becoming more and more involved in multidisciplinary teams as "process optimizers". They help with medication review, IV to oral conversion, dose adjustments and toxicity monitoring that prevent work duplication and free up more time for physicians to dedicate to diagnosis and complex patient management. The same findings have been reported in other parts of the world, such as the connection between clinical pharmacy services and greater coordination of work flows and fewer physician responsibilities (Guo et al., 2020; Mendes et al., 2022). Specifically, health professionals in Qatar noted that pharmacists facilitated the smooth running of the services by ensuring proper medication management and reducing interruptions associated with

prescription clarification or dosage query (Jebara et al., 2021). The current results from Karachi support these interpretations that not only do CPS benefit the patients' safety but also the smooth functioning of the institution.

One of the most salient experiences of the participants was the experience of workload reduction. Physicians termed pharmacists as professionals who take up a lot of pharmacological and administrative responsibility that can be assumed by medical personnel. In the real world, physicians are no longer required to keep an eye on each nephrotoxic medication, do all of the math, or verify compatibility and interactions every time. This level of support is particularly useful in a tertiary care setting where doctors treat very sick patients and complex treatment regimens under tight time constraints. The same results have been reported in oncology settings in Qatar, where healthcare staff identified that pharmacists played a significant role in coordinating and ensuring the accuracy of treatment in environments where there are high risks (Omar et al., 2020).

An "interpretative finding" is the reduction of mental burden. The physician's "lived experience" has changed from "worry" about the accuracy of the dose to "confidence" in the pharmacist's "check and balance system". This shift from the psychological and perceptual state of anxiety to confidence is significant in the physician's professional journey. Participants were no longer aware of only their own responsibility for solving all the issues related to medication. Rather, they had a feeling of the pharmacist's role as a partner in patient care. Rather, there was a sense of the pharmacist as a partner in patient care. This mutual reassurance seems to improve both efficiency and psychological comfort in clinical practice. Like in Ghana and Qatar, other studies indicated that healthcare providers found pharmacists to be a source of stress reduction and smoother management of patients (Appiah-Num Safo et al., 2022; Jebara et al., 2021).

The new idea of the "mental burden" also points towards an increasing confidence in pharmacists as qualified clinical practitioners. Interpersonal

trust is essential to interdisciplinary health teamwork because effective teamwork relies on trust for the other person's expertise and consistency. Pharmacists' independent workups and therapeutic evaluations were mentioned repeatedly by the participants in this study in the way they complemented the decision-making of physicians. This discovery is in stark contrast to the traditional views in Pakistan that pharmacists are mainly considered to be stock holders or dispensers (Atif et al., 2020; Khan et al., 2020). This current study, therefore, suggests the changes and continuities in the professional identity and interprofessional working relationships in the tertiary healthcare settings of Karachi.

But the study also stresses the "ego factor" and "manpower shortage" as "systemic stressors". They indicate that although clinical pharmacy is gaining clinical respect, it is still structurally and hierarchically resisted. The participants reported situations where younger pharmacists made recommendations that were not accepted by senior consultants, as a consequence of hierarchical norms in medicine. This discovery is in line with the one reported in other healthcare systems in the region, such as Saudi Arabia, where physicians recognized the abilities of the pharmacists, but they were not keen on giving away the freedom to make clinical decisions to the Pharmacist (Almazrou et al., 2015). This resistance shows that the implementation of CPS is not just a clinical problem, it's a cultural and organizational problem as well.

A possible explanation for the "ego factor" reported by respondents is a larger "culture of medical dominance" noted in the existing literature (Almazrou et al., 2015). Traditionally, prescribing authority and therapeutic decisions have been perceived as solely the physician-role. As a result, pharmacists' interventions sometimes might be seen as intruding on the medical profession, not as working alongside them to provide patient safety. Participants recommended that the tensions could be addressed with increased institutional leadership, enhanced interdisciplinary dialogue, and ongoing mindfulness of the changing clinical role of the

pharmacist. Similar findings are found in the literature that studies barriers to implementation of CPS in LMICs, and poor role clarity and hierarchies of professionals still hinder collaboration (Atif et al., 2022; Sin et al., 2022).

Another big systemic stressor found in this study is a shortage of trained clinical pharmacists. Current "ten pharmacists for 27 specialties" is read as "stretched" and a strong call for "specialty-specific" expansion is made. It was repeatedly highlighted that pharmacists would not be able to have a meaningful clinical role in many departments without sacrificing standards of service. This is consistent with the context of Pakistan where the lack of training of the workforce in pharmacy and inadequate institutional investment in clinical pharmacy infrastructure is a pressing global issue (Khan et al., 2020). There is also a lack of continuity of care due to a lack of specialized pharmacists, as they may not be able to focus on specific specialties, e.g., oncology, nephrology, cardiology.

Specialists strongly supported the deployment of pharmacists, which would entail individual pharmacists becoming central figures within the specialty-specific clinical units. This is based on the international concept of advanced clinical practice, where pharmacists work in specialty teams and acquire a very specialized therapeutic skill (Omar et al., 2020). This integration makes it possible for pharmacists to be more involved in ward rounds, therapeutic planning, toxicity monitoring and individual patient counseling. The findings indicate that the future expansion of CPS in Karachi should be beyond a generic model of pharmacy services and towards more specialized and department/organ-specific approaches.

The manpower shortage also reveals the gap between the reform of the curricula of Pakistan's pharmaceutical sciences and their implementation in workforces. The PharmD degree was a new development to improve clinical skills; however, participants suggested that the health services have not yet been successful in utilizing these professionals. (Khan et al., 2020) The current literature also indicates that, despite the educational improvements, involvement of

pharmacists in direct patient care is still limited in Pakistan (Atif et al., 2020). As a result, CPS needs to recruit more personnel and redesign its operations, clarify roles and provide greater administrative support.

Overall, the results illustrate the clinical pharmacy services within Karachi to be in a transition phase between the basic dispensing service and a complete integration into clinical practice. The role of the pharmacist in patient safety, improved workflow, and therapeutic precision is undeniable in the healthcare field. The role of the pharmacist is increasingly seen as vital to the clinical team, thus enhancing the integrity and effectiveness of tertiary care services. Meanwhile, there are ongoing structural barriers that hinder the potential of CPS in the health care system, such as hierarchical resistance, workforce gaps, and inadequate specialty-specific integration. Hence, the findings indicate the need to enhance institutional support, foster collaboration between different professions and increase specialized clinical pharmacy services to work sustainably in the context of tertiary care hospitals in Karachi.

Conclusion

In accordance to this research, clinical pharmacy services are considered by medical personnel as a vital requirement and a pivotal instrument of strategy to strengthen patient safety and organizational effectiveness. As "clinical partners," pharmacists provide an indispensable safety net for medical professionals and their patients in equal measure. The idea still has shortcomings in spite of the service's obvious advantages, which include avoiding or treating potentially fatal electrolyte imbalances (such potassium replacement) and achieving significant cost savings. These include a lack of human resources and obstacles related to culture or attitude that restrict the effectiveness of the service's implementation.

Strategic Recommendations for Management:

1. **Workforce Expansion:** In order to transition from a "stretched" coverage approach to a specialty-specific pharmacist presence in every department, hire more pharmacists.

2. **Elevation of Formal Authority:** Create cooperative procedures that minimize professional conflict and allow pharmacists to safely make recommendations and modifications pertaining to medications.

3. **Integration of Education and Training:** To encourage more rigid multifaceted collaboration, include pharmacists in surgical workshops, medical lectures, and residency or postgraduate programs.

4. **Technological Uplift:** To facilitate sophisticated dosage calculations and give the multidisciplinary team timely information, use the proper decision-support technologies, such as AI-based solutions.

5. **Enhanced OPD and Discharge Support:** Develop a dedicated Pharmacy OPD area to ensure continuity of medication, especially by enhancing outpatient medication counseling and fortifying discharge procedures.

By utilizing such approaches, Karachi's hospitals may reinforce the clinical pharmacist's position as a vital part of daily clinical operations, eventually encouraging the shared aim of all medical professionals: ensuring exceptional patient care.

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