

Hospital pharmacists' perceptions of collaboration with nurses for medication safety: A qualitative study in public hospitals

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ABSTRACT

Background: Ensuring medication safety requires effective interprofessional collaborative practice (ICP) between pharmacists and nurses. However, this collaboration faces substantial obstacles across healthcare systems.

Objective: To explore hospital pharmacists' perceptions and experiences of interprofessional collaboration with nurses in relation to medication safety, including perceived facilitators, barriers, and recommendations for improvement.

Method: This qualitative study used purposive and snowball sampling through face-to-face, semi-structured interviews with hospital pharmacists, conducted between November 2025 and January 2026. The Stutsky and Laschinger ICP Conceptual Framework informed the development of the interview guide; thematic analysis proceeded inductively, following Braun and Clarke's (2006) six-phase approach, with emerging themes interpreted in relation to the framework's constructs.

Results: The study involved 36 hospital pharmacists (27 women and 9 men) from eight public hospitals, with an average experience of 5.3 years. Three interpretive insights emerged from the study. First, interpersonal facilitators (particularly trust, respectful communication, and proactive information sharing) were found to support collaboration. Second, structural and organizational barriers, including resource constraints, professional hierarchy, and limited legal recognition of pharmacists' clinical authority, were identified as factors that constrained collaboration. Finally, participants linked collaboration to perceived improvements in medication safety and proposed infrastructural, organizational, and joint-training strategies to strengthen it further.

Conclusion: These findings suggest that, in resource-constrained settings, pharmacist-nurse collaboration may rely more heavily on individual initiative than on institutional support structures. From pharmacists' perspectives, this was evident in Iraqi public hospitals, where structural, hierarchical, and legal barriers shaped both professions' practice. Strengthening role policies, communication structures, and interprofessional training may support pharmacists' ability to contribute to safer collaborative practice.

1. Introduction

The World Health Organization, in its Global Patient Safety Action Plan 2021–2030, calls for a safety culture and the elimination of avoidable harm in healthcare through the optimization of working environments, highlighting multidisciplinary and interprofessional approaches as the radical new direction required for improving patient safety.¹ Interprofessional Collaborative Practice (ICP) is crucial for attending to patients' complex healthcare needs, encouraging high-quality treatment and improving healthcare systems.² Of the

numerous collaborations that can improve the provision of healthcare, the cooperation between nurses and pharmacists has attracted considerable focus in the last few years. This collaboration is an effective approach to enhance medication and patient safety.³ Nurses and pharmacists bring complementary expertise to patient care; nurses prioritize holistic patient assessment while pharmacists specialize in pharmacotherapy optimization, and their combined synergy addresses gaps in medication management, ultimately improving clinical outcomes and reducing healthcare costs.⁴ Studies have demonstrated that pharmacist-nurse collaborative medication reconciliation has been associated with

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reduced post-discharge readmission rates,⁵ while broader interprofessional collaboration involving pharmacists has been linked to improved drug-related problem identification and patient outcomes in selected settings.^{6,7}

Although pharmacist-nurse collaboration for medication safety has demonstrated benefits in selected settings, interprofessional collaboration is a multidimensional process shaped by individual, team, organizational, and system-level attributes,⁸ each of which is profoundly influenced by the specific contextual conditions within which healthcare professionals operate. Iraq's public healthcare system has deteriorated significantly over the past four decades due to wars, sanctions, corruption, and chronic underfunding, leaving public hospitals constrained by weak resources, low staff morale, and extreme structural deficiencies, with governance systems that are highly centralized and vulnerable to political interference.⁹ These contextual conditions are substantially distinct from those in which most interprofessional collaboration research has been conducted, necessitating locally grounded investigation rather than direct application of externally derived evidence.

Within the Iraqi healthcare context, pharmacist-nurse collaboration and its implications for medication safety remains largely unexplored. Few studies examining interprofessional collaboration among pharmacists, nurses, and physicians in Iraqi hospitals were confined to a single province and unit, reported a substandard collaboration level, yet provided no insight into the all possible determinants underlying this deficit.^{10,11} A scoping review of 29 instruments measuring interprofessional collaboration in healthcare revealed that none was specifically designed to measure collaboration between pharmacists and nurses as a distinct dyad.¹² The interprofessional literature has been characterized as largely atheoretical, with elements of collaboration remaining poorly conceptualized and a consistent framework to guide research notably absent.¹³ To guide the exploration of these determinants, a theoretical framework capable of capturing both the interpersonal and structural dimensions of pharmacist-nurse collaboration was required. The Stutsky and Laschinger (2014) ICP framework addresses this need directly, having been developed from a synthesis of 97 research papers and empirically tested through path analysis, demonstrating that personal and situational antecedents significantly predict ICP and that ICP in turn predicts individual, team, and organizational outcomes. Underscoring the need for a comprehensive framework capable of accommodating this underexplored relationship. The Stutsky and Laschinger framework was therefore selected as the theoretical foundation for the present study.¹³

Given that existing quantitative evidence from Iraq has documented substandard interprofessional collaboration scores,^{10,11} a qualitative approach was deemed most appropriate for the present study. Qualitative research is particularly advantageous when investigating topics involving participants' in-depth experiences and perceptions that have not yet drawn sufficient attention and when exploring phenomena that require examination from a new perspective.¹⁴ Understanding the perspectives of each professional group separately is a necessary step. Such differentiation provides the foundation for optimizing collaborative practice.¹⁵ To the best of our knowledge, no previous qualitative research has examined pharmacist-nurse collaboration from the pharmacist's perspective in Iraq. Accordingly, the present study focused on hospital pharmacists as an initial and necessary step toward generating contextually grounded evidence on this understudied dyadic relationship within Iraqi public hospitals. The present study therefore aimed to explore hospital pharmacists' perceptions and experiences of interprofessional collaboration with nurses in relation to medication safety, including perceived facilitators, barriers, and recommendations for improvement.

2. Method

2.1. Study design and settings

This study employed an exploratory qualitative design, guided by a

constructivist epistemological orientation. Face-to-face, semi-structured interviews were conducted across eight public hospitals in two Iraqi provinces between November 2025 and January 2026. Two provinces were deliberately selected to broaden the geographic scope, and within each province four major public hospitals were included-comprising four general and four specialized hospitals (operating by referral from general hospitals or primary healthcare settings). The specialized hospitals covered women's and children's health, pediatrics, and psychiatry/mental health, thereby ensuring diversity of clinical contexts and patient population. Although the study was conducted in two provinces, the structural and organizational conditions of public hospitals in Iraq are broadly comparable across provinces, as they operate under the same centralized Ministry of Health governance framework, supporting the transferability of findings to other Iraqi public hospital settings. The qualitative design was chosen to explore nuanced dimensions of professional interaction that may not be fully captured through quantitative approaches.

2.2. Participant recruitment

Pharmacists were primarily recruited through purposive sampling to ensure the inclusion of individuals with ward-based practice experience. In addition, a snowballing technique was employed, whereby participants recommended colleagues who might be interested in joining the study. The first author approached pharmacists in person directly during official working hours. Participation was explicitly voluntary, with each pharmacist informed that declining or withdrawing at any time would carry no professional consequences whatsoever. Institutional approval letters were obtained from both provinces' health directorates prior to data collection, and no supervisory staff were present during recruitment or interviews. The recruitment spanned a wide range of wards and departments, including internal medicine, neurology, intensive care, cardiac care, emergency, pediatrics, gynecology, surgery, hematology, gastroenterology, hemodialysis, peritoneal dialysis, oncology, inpatient pharmacy, and the pharmacy department. Pharmacists working in inpatient pharmacy units were included on the basis of their self-reported ongoing nurse-initiated contact, as nursing staff continued to approach them directly with medication-related queries. Pharmacists based in pharmacy departments were also included, as their prior ward-based experience, combined with their administrative coordination with nursing supervisors, their role in resolving interprofessional conflicts between pharmacists and nurses, and their awareness of ward-level challenges escalated to their department, positioned them to offer realistic recommendations and organizational insights that meaningfully enriched the data.

Interviews continued until data saturation was achieved, as assessed by the second author, an experienced qualitative researcher, through ongoing review of interview content after each session. Saturation was determined when no new codes or themes emerged across the interview questions, which occurred at approximately the thirty-third interview; the remaining three interviews were conducted to confirm saturation. Each interview lasted approximately 30 to 90 min and was conducted in Arabic within each hospital, in quite unoccupied room on the floor or at the pharmacist's workstation (when available and vacant) to ensure privacy. Of the 36 participants, 29 consented to audio recording. The seven participants who declined recording were interviewed under identical conditions; the first author documented each response in detailed contemporaneous written notes during the interview and read them back to the participant for verification before proceeding to the next question, ensuring accuracy of the written record. Audio-recorded interviews were transcribed verbatim in Arabic, while interview notes from the seven non-recorded sessions were similarly prepared in Arabic; all data, whether transcripts or interview notes, were then translated into English by the research team with the assistance of artificial intelligence translation tools, followed by two bilingual experts' review, with no analytical distinction made between the two data types. All

interviews were conducted by the first author (ZH). The interviewer, a female pharmacist with prior hospital pharmacy experience, was well positioned to build trust with the hospital pharmacist interviewees. While this experience was an asset, she maintained a neutral interviewing stance throughout, refraining from leading questions and allowing participants to direct their own accounts.

She conducted pilot interviews with five pharmacists prior to the main study, which helped refine the interview guide and her interviewing technique. The five pilot interviews, conducted to refine the interview guide were included in the final dataset since no major revisions to the guide were required. No prior relationship existed between the interviewer and participants; participants were informed that she was a master's student conducting research on pharmacist-nurse collaboration as part of her thesis.

2.2.1. Inclusion criteria

Eligible participants were hospital pharmacists with at least one year of ward-based experience who maintained ongoing contact with nursing staff from their current position, whether on a daily or weekly basis.

Although no formal subgroup analysis was conducted, the research team observed no meaningful differences in the thematic patterns between ward-based and inpatient/administrative pharmacy participants with respect to perceived barriers and facilitators. Participants in administrative or supervisory roles tended to propose broader and more system-level improvement strategies, reflecting their wider institutional perspective; however, this variation did not alter the overarching themes identified.

2.2.2. Exclusion criteria

Pharmacists with less than one year of hospital experience or those who reported no meaningful contact with nursing staff were excluded.

2.3. Theoretical framework and the interview guide

The Conceptual Framework for Interprofessional Collaborative Practice (ICP), developed by Stutsky and Spence Laschinger,¹³ provided the theoretical foundation for this study and guided the development of the semi-structured interview guide, ensuring that questions systematically addressed the domains of antecedents, collaborative practice, and outcomes. The interview guide comprised ten thematic sections, with questions aligned with the constructs of the ICP framework, including personal and situational antecedents, ICP dimensions, and outcomes, as well as additional sections addressing barriers and recommendations (Appendix A). Questions were formulated to elicit pharmacists' experiences, perceptions, and recommendations regarding collaboration with nurses. While the framework informed the development of the interview guide, thematic analysis proceeded inductively from participants' responses without imposing the framework's structure on the coding or theme development process.

2.4. Thematic analysis

Themes and subthemes were generated from pharmacists' responses following Braun and Clarke's (2006) six-phase approach to thematic analysis.¹⁶ These steps include familiarization with the data, generating initial codes, searching for themes, reviewing themes, defining and naming themes, and producing the final report. All interviews, whether based on recorded transcripts or researcher notes, were documented in a single Excel sheet and analyzed using the same six-step thematic analysis process. Coding was conducted collaboratively by the first and second authors, with themes refined and agreed upon through discussion.

Initial coding and theme development were conducted on the English translations. Following each coding decision, the coder cross-referenced the original Arabic source material to confirm accuracy and contextual fidelity.

Interview recordings were transcribed verbatim in Arabic to preserve

participants' original expression, then translated into English by the research team, followed by thorough review and correction, before proceeding to analysis. Quotations reported in the manuscript represent consensus translations agreed upon by the bilingual members of the research team; back-translation was not employed, but key passages were cross-checked independently to ensure accuracy and preserve the intended meaning. Guided by a constructivist epistemological orientation, we employed an inductive analytical approach. Specifically, themes were created from recurrent patterns in participant responses. Repeated phrases or concepts were assigned codes, which were organized and managed manually using Microsoft Excel. Coding was conducted collaboratively by the first and second authors. The third author reviewed the final version of the themes and interpretations to ensure they were grounded in the data. Codes were generated inductively and then grouped into categories, which were refined into subthemes and synthesized into overarching themes through the six-step thematic analysis process. Themes and subthemes were then organized into broader patterns to capture the depth and diversity of participants' perspectives. While thematic analysis proceeded inductively, the emerging themes were found to align closely with the constructs of the Stutsky and Laschinger ICP framework, with identified themes corresponding to personal antecedents, situational antecedents, and consequences of ICP, respectively.

Several strategies were employed to enhance the trustworthiness of this study, drawing on the framework proposed by Amin et al. (2020).¹⁷ Credibility was strengthened through the first author's prior hospital pharmacy experience, which facilitated rapport with participants and informed contextual understanding of ward-based practice. While this experience was an asset, she maintained a neutral interviewing stance throughout, refraining from leading questions and allowing participants to direct their own accounts. Nevertheless, the research team acknowledges that any researcher's disciplinary background carries the potential for interpretive assumptions, particularly in probing during interviews, interpreting participants' accounts, and making coding decisions. This was mitigated through collaborative coding between the first and second authors, and peer debriefing conducted twice throughout the analysis phase, with the third author, a nursing specialist, reviewing emerging themes to ensure findings were not interpreted solely through a pharmaceutical lens. Investigator triangulation was achieved through the involvement of a multidisciplinary research team: the second author, a specialist in clinical pharmacy, collaborated with the first author throughout the coding and theme development process, while the third author reviewed the final themes from a nursing perspective to ensure analytical balance. Transferability was supported through contextual description of the study setting, participant characteristics, and the specific barriers and facilitators observed.¹⁷

2.5. Ethical considerations

Ethical approval was obtained from the University of Baghdad College of Pharmacy Research Ethics Committee (RECAUBCP0625185R), along with subsequent health-directorate approvals. The committee approved verbal informed consent as the appropriate consent procedure, as the study was non-interventional and posed minimal risk to patients. Participants were informed of their right to withdraw at any time without consequence. To protect confidentiality within hospital settings, interviews were conducted individually and away from colleagues, no participant names were shared with hospital management, and findings are reported at the group level with no individually identifiable information. No personally identifiable information was collected, participants were assigned coded identifiers, and all recordings, transcripts, and notes were stored securely with access restricted to the research team.

3. Results

3.1. Participant demographics

A total of 36 hospital pharmacists participated, comprising 27 women (75%) and 9 men (25%), with professional experience ranging from 1 to 19 years (mean 5.3 years). The majority were engaged in ward-based clinical practice ($n = 30$, 83.3%), while six participants (16.7%) were based in pharmacy departments or inpatient pharmacy units who maintained ongoing engagement with nursing staff from their current position, as described under the inclusion criteria. Full demographic details are presented in Table 1.

3.2. Overall assessment of pharmacist-nurse collaboration from pharmacists' perceptions

Participants described their overall collaboration with nursing staff as variable, reflecting a mixed picture that varied across departments and individual personalities. Many participants perceived collaboration as generally positive, attributing this to trusting relationships and proactive clinical engagement, while others described it as below expectations, linking lower assessments to systemic isolation and high workloads.

"Near total collaboration, due to building friendships with nursing staff and being available whenever needed." (Pharm 16).

"About half of nurses actually cooperate with us, report, and attempt to educate patients." (Pharm25).

These self-assessments provide a contextual backdrop for the themes explored in the following sections. The main themes and subthemes derived from the analysis are presented in Table 2.

3.3. Theme 1: Interpersonal factors shaping collaboration

3.3.1. Trust, Communication Style, and Information Sharing

Participants described trust and mutual respect as central to their collaboration with nurses. When mutual trust existed, nurses were more likely to proactively consult pharmacists and accept clinical advice.

"Trust is very important. Nurses in our department trust the attending pharmacist. In one incident, a patient was mistakenly given calcium"

Table 1
Demographic characteristics of the participating pharmacists.

Characteristic	Category	Frequency (n)	Percentage (%)
Gender	Female	27	75.0%
	Male	9	25.0%
Province	Al-Diwaniyah	19	52.8%
	Al-Najaf	17	47.2%
	1–5 Years	24	66.7%
Experience	6–10 Years	8	22.2%
	>10 Years	4	11.1%
	Range: 1–19 years; Mean: 5.3 years		
Education/ Certification	B.Sc. in Pharmacy	25	69.4%
	Clinical Pharmacist (PGY1 Resident)	4	11.1%
	Master's Degree (M. Sc./M.A.)	6	16.7%
	Specialist (Board Certified)	1	2.8%
Leadership Role	Count		Participant Codes
	Head of Pharmacy Department (Hospital-wide)	2	Pharm 9, Pharm 17
	Head of Clinical Pharmacists	2	Pharm 3, Pharm 27
	Head of Pharmacists (Specific Ward/Unit)	10	Pharm 20, 22, 23, 24, 25, 26, 28, 30, 31, 33

Table 2

Themes, subthemes, and illustrative quotations from pharmacists' interviews.

Theme	Subtheme	Illustrative Quotation
Theme 1: Interpersonal Factors Shaping Collaboration	1.1 Trust, Communication Style, and Information Sharing	"In one situation with vancomycin preparation by a nurse, the nurse noticed turbidity in the solution and returned to the pharmacist before administering it to the patient. The nurse's trust in the pharmacist played a role in resolving the problem." (Pharm1)
	1.2 Willingness to Exceed Formal Role Boundaries	"Sometimes tasks beyond formal duties are performed to avoid mistakes. For example, pharmacists initially operated the infusion pump alongside nurses until the nursing staff learned to use it properly." (Pharm35)
	2.1 Resource Constraints and Infrastructure Deficits	"We lack a dedicated workspace. The room I use is shared with doctors and anesthetists, sometimes forcing me to leave the unit. This can create the false impression I am absent." (Pharm15)
Theme 2: Structural and Organizational Barriers to Collaboration	2.2 Professional Hierarchy and Interprofessional Tensions	"I faced a problem dealing with senior nurses due to their low-trust view of the pharmacist who is younger in length of service years." (Pharm3).
	2.3 Policy, Legal, and Educational Deficits	"Yes, particularly perceptions of professional hierarchy. Some nurses feel, 'We work harder than pharmacists and our role is more critical, so why is our formal ranking lower?'" (Pharm17)
	3.1 Error Mitigation and Critical Clinical Interventions	"When negligence occurs, for example during the night shift, and I submit a memorandum, it reaches a certain level and stops because the nursing side is often stronger than the pharmacy side. The memorandum ends without outcome, and blame is placed on the pharmacist." (Pharm31)
Theme 3: Pharmacists' Perceived Contributions of Pharmacist-Nurse Collaboration to Medication Safety	3.2 Clinical Conflict Resolution and Patient Care Outcomes	"When we began calculating enoxaparin scores, we reduced many potential problems. We often hear stories of women dying after childbirth due to thrombosis. By alerting physicians to prescribe enoxaparin and reminding nurses about the timing of administration, we believe we saved many lives." (Pharm35)
		"In one situation, I intervened to change the administration method of a specific treatment, and there was trust and responsiveness from the nursing staff to follow the instructions." (Pharm2)

(continued on next page)

Table 2 (continued)

Theme	Subtheme	Illustrative Quotation
Theme 4: Pharmacists' Perceived Strategies for Improving Collaboration	4.1 Infrastructure, Digital, and Organizational Reforms	"Implementing the medication room is a system that greatly eased cooperation. Instead of preparing medication near the patient, preparation is done in special boxes for each patient in the room, with a dedicated sterile table for reconstitution, with pharmacists also present, facilitating communication between the nurse and pharmacist about medications." (Pharm22) "Management must formally emphasize mutual respect, particularly nurses' respect for the clinical pharmacist's therapeutic guidance. The pharmacist's role is currently ineffective due to this lack of recognized authority. There is no management directive formally recognizing this." (Pharm15) "Joint workshops would significantly improve collaboration, as the morning round cannot accommodate all nursing staff. Workshops are the solution for direct, comprehensive information delivery." (Pharm14)
	4.2 Clinical Practice, Education, and Leadership development	"The supervisor plays a key role; a supportive and understanding supervisor significantly aids in problem-solving." (Pharm13)

instead of ceftriaxone. The nurse contacted us; we stopped the calcium, administered the ceftriaxone... and the situation proceeded normally." (Pharm28).

Participants emphasized that a respectful, non-authoritarian approach was essential for facilitating the acceptance of clinical guidance. Pharmacists noted that using friendly tones, often backed by scientific evidence, prevented the defensive resistance that followed a commanding delivery.

"Giving them instructions in a commanding tone. A nurse... does not like that and prefers not to deal with the pharmacist. The style of communication is very important for both parties." (Pharm22).

"When I present any topic, I do so in a firm yet friendly manner, always supporting my points with scientific references, so nursing staff always accept my guidance." (Pharm32).

Participants underline the absence of formally sanctioned interprofessional communication channels, so they relied on unofficial means such as instant messaging applications and phone calls inside and outside official working hours.

A number of participants also described proactive information sharing with nurses, particularly for newly introduced medications, high-alert drugs, or unfamiliar administration requirements.

"Communication is usually face-to-face during official work hours and by phone outside official work hours, as clinical pharmacists' numbers are available for response." (Pharm9).

"I communicate with the nursing supervisor via WhatsApp regarding any new memos." (Pharm30).

3.3.2. Willingness to exceed formal role boundaries

A number of participants described a willingness to perform tasks beyond their formally defined duties in order to support nursing staff and prevent medication errors. These extra-role behaviors included assisting with medication reconstitution, advising on intravenous access, and organizing patient files. Participants framed such role expansion as a means of strengthening interprofessional collaboration and ensuring patient safety.

"We often exceed our official duties to help, such as organizing patient files and advising on cannulas or the number of IV lines a patient needs." (Pharm10).

"There are tasks outside our core duties; for example, I assist in reconstituting some medications... for greater accuracy, I reconstitute some myself." (Pharm32).

3.4. Theme 2: Structural and organizational barriers to collaboration

3.4.1. Resource constraints and infrastructure deficits

Participants described high patient loads, inadequate staffing, and lack of dedicated time as barriers that reduced communication with nursing staff to immediate clinical necessities.

"Due to the high patient load and lack of time, it causes difficulty in communicating with the nursing staff and focusing only on necessities." (Pharm1).

The absence of designated workspaces forced pharmacists to share rooms with other staff or leave their units entirely, limiting their physical availability. Physical distance between pharmacy and nursing work areas was also identified as reducing spontaneous communication.

"There is no suitable place or dedicated chairs for us... no designated place for pharmacists where nurses can find us immediately if they need to ask a question." (Pharm28).

"The pharmacists' room is at the end of the ward corridor, while the nurses' station is at the beginning. If our room were next to theirs, we would be more aware of ward happenings; we feel somewhat isolated within the ward." (Pharm31).

Lack of ward-based printers, absence of electronic systems, and shortage of medical supplies added further logistical difficulty that reduced available time and conditions for collaboration.

"We need many printed administrative orders and daily forms, but we do not have a dedicated printer. Therefore, we have to go to the pharmacy department to print... Our absence from the ward during this time for printing means if nursing staff need us, they will miss us." (Pharm28).

"The absence of electronic systems reduces opportunities for effective communication." (Pharm1).

"Resource shortages affect collaboration in other aspects; for example, the unavailability of syringes and some medical supplies leads nurses to believe the shortage is the pharmacists' fault." (Pharm26).

3.4.2. Professional hierarchy and interprofessional tensions

Participants described hierarchical perceptions and seniority differences as significant obstacles to collaboration. Senior nurses were perceived as less receptive to guidance from younger or newly appointed pharmacists, with some interpreting pharmacist input as arrogance or encroachment on their professional territory. Professional sensitivities were also reported from the pharmacist side, with some pharmacists perceived by nurses as condescending.

"The only barrier in my view is the age difference. If the nurse is older than us, their response is usually less, and they have a desire to impose their opinion due to confidence in their experience and a lack of trust in the newly appointed or younger pharmacist." (Pharm8).

"There are professional sensitivities, especially among nurses, from their feeling that there is belittlement of them by pharmacists. In one situation, a nurse said about me, 'He treats me with arrogance'." (Pharm5).

Beyond individual interactions, some participants situated these tensions within a broader societal context, suggesting that professional hierarchies in Iraqi healthcare settings are shaped by deeply rooted social class distinctions rather than clinical roles alone.

"Unfortunately, Iraqi society has imposed some class distinctions even though the nurse's role is as important as the doctor's." (Pharm3).

3.4.3. Policy, legal, and educational deficits

A consistent gap in interprofessional collaboration training was reported across interviews, with university education described as focusing exclusively on communication with patients and physicians, leaving nursing staff interaction entirely unaddressed. This deficit was seen as persisting beyond graduation, with no structured workplace training available to bridge the gap in practical collaboration skills.

"In our studies we learned how to communicate with patients or doctors, but communication with the nursing staff was not addressed." (Pharm1).

"I believe we suffer from a lack of training on work within the institution... because learning work and administrative procedures currently happens through experience, not through clear fundamentals to follow." (Pharm27).

A number of pharmacists described their clinical authority as limited. Nursing staff were described as declining to act on pharmacist guidance without formal physician documentation, and pharmacists described retreating into narrowly defined, formally documented duties out of fear of legal consequences.

"The authority of pharmacists is limited, particularly for trainee pharmacists. For instance, in cases of incorrect dosages or treatments, nurses do not adhere to the pharmacist's instructions unless the specialist doctor formally modifies the patient's chart. This is often justified by the claim, 'There is no evidence to protect me'." (Pharm12).

"In Iraq, I am not willing to go beyond my formal duties, because there is no legal protection." (Pharm13).

Delays in physician chart authorization further illustrated this dependency, as postponed medication dispensing created workflow disruption and time pressure that affected both pharmacists and nursing staff.

"Delays in physician chart authorization can postpone medication dispensing and disrupt workflow. This time pressure reduces opportunities for collaboration and often leads to nursing frustration, which is frequently misdirected as blame toward pharmacy." (Pharm12).

Role ambiguity emerged as a source of friction between pharmacists and nurses, particularly around overlapping responsibilities in medication reconciliation and patient education.

"Responsibilities are not clear. For example, it is the nurse's responsibility to inform the pharmacist upon a new patient admission, but in many instances, there is no notification." (Pharm5).

"Sometimes nurses independently instruct patients to change doses or buy unavailable drugs." (Pharm36).

Several participants also described differential accountability standards as deepening this ambiguity, with pharmacists perceived as being held to stricter standards than nursing staff for equivalent medication-

related failures.

"The lack of fairness in treatment by management plays a role in reducing collaboration sometimes. We notice that there is accountability for one party but not the other. If a medication is not provided by a pharmacist, it is considered a major problem, but if a nurse fails to administer a medication, it is considered merely negligence." (Pharm1).

Taken together, participants described these structural and organizational barriers as mutually reinforcing: inadequate staffing reduced time available for interaction, physical separation limited spontaneous communication, the absence of electronic systems added logistical burdens, unclear professional authority diminished pharmacists' confidence to intervene, and differential accountability standards created a demoralizing context that further constrained collaborative engagement.

3.5. Theme 3: Pharmacists' perceived contributions of pharmacist-nurse collaboration to medication safety

3.5.1. Error mitigation and critical clinical interventions

Pharmacists described collaboration with nursing staff as contributing to the identification and prevention of medication errors. Accounts ranged from routine error correction to more critical situations where joint action was perceived as preventing serious patient harm. Proactive information sharing was also described as playing a preventive role, particularly where pharmacists had previously educated nurses about specific medication risks.

"In one incident, darbepoetin was prescribed for a patient before lab results were available. We had previously informed the nursing staff that it should not be administered if the hemoglobin exceeds 10.5 due to an increased risk of thrombosis. The nurse returned to confirm whether to administer it... We intervened to withhold the medication by contacting the physician and postponing the dose." (Pharm31).

3.5.2. Clinical conflict resolution and patient care outcomes

Pharmacists described resolving clinical disagreements with nursing staff through direct personal communication. Some linked collaborative practice to perceived improvements in patients' clinical status, describing specific instances where joint decision-making was associated with what they perceived as positive care outcomes.

"The protocol changes for calcium supplementation from intravenous to oral administration, executed in collaboration with nursing staff, led to a demonstrable improvement in patients' biochemical and clinical status." (Pharm11).

"Our writing of the method of administration and its adherence by nurses ensures that treatment reaches the patient correctly, and the patient leaves the hospital improved." (Pharm33).

As illustrated in Fig. 1, the identified themes align with the domains of the Stutsky and Laschinger ICP framework, with interpersonal factors corresponding to personal antecedents, structural and organizational barriers to situational antecedents, and perceived collaborative outcomes to the consequences domain.

3.6. Theme 4: pharmacists' perceived strategies for improving collaboration

3.6.1. Infrastructure, digital, and organizational reforms

Electronic prescribing systems and dedicated medication workspaces were proposed for reducing errors and facilitating communication. A dedicated medication room was already operational in one participating hospital (a 492-bed facility), where pharmacists and nurses shared a space for medication preparation; participants noted it reduced missed doses, minimized contamination risks, and facilitated direct communication.

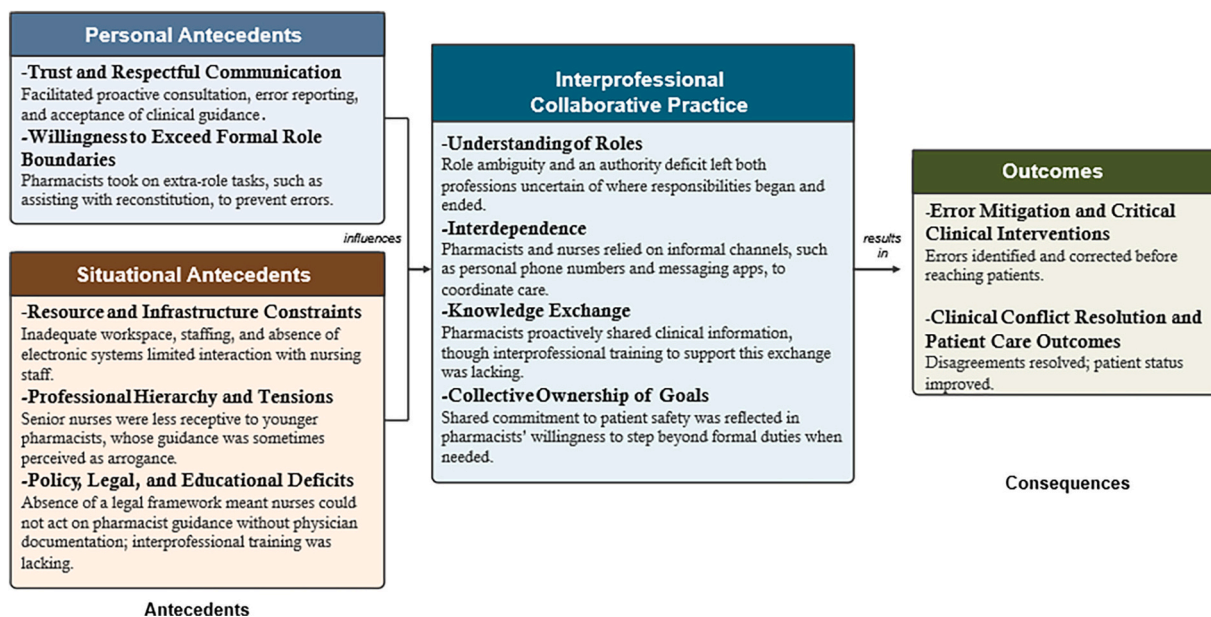


Fig. 1. Mapping of pharmacists' perspectives onto the Stutsky and Laschinger (2014) Interprofessional Collaborative Practice (ICP) Framework in Iraqi public hospitals.

"Implementing an electronic system would be excellent and would enhance collaboration and patient safety." (Pharm29).

"We reduced many errors by establishing the medication room, which provided more time for communication with nursing staff away from patients, and also reduced medication wastage." (Pharm33).

At the organizational level, pharmacists called for management advocacy to formalize pharmacist clinical authority and expand workforce support.

"I believe clinical pharmacists' authority should be expanded to allow dose modification without mandatory physician referral when an error is identified in the chart." (Pharm14).

3.6.2. Clinical practice, education, and leadership development

For clinical practice, standardization of joint morning rounds and double-checking protocols for high-risk medications were proposed as systematic safeguards.

"Breaking the barrier of functional hierarchy through joint morning rounds." (Pharm9).

participants emphasized the need for interprofessional education targeting communication and soft skills, alongside competency-based leadership selection and moral incentive systems to sustain a collaborative culture.

"This is possible through lectures by TOT specialists in communication skills, negotiation skills, and teamwork abilities. Soft skills are also important to give lectures on for pharmacists and nurses, which will enhance cooperation and cause the success of any institution." (Pharm23).

"Selection of leadership- should be based on specific qualifications- besides seniority, they should have a sociable, pleasant personality to gain everyone's respect." (Pharm32).

4. Discussion

This study explored hospital pharmacists' perceptions and experiences of interprofessional collaboration with nurses in Iraqi public

hospitals, guided by the Stutsky and Laschinger (2014) ICP framework, extending the limited existing evidence by offering contextually grounded findings on the facilitators, barriers, perceived implications for medication safety, and improvement strategies associated with pharmacist-nurse collaboration in a resource-constrained setting. As the data were drawn exclusively from pharmacists, the findings reflect one professional perspective rather than independently verified observations.

4.1. Informal collaboration is strong but fragile

From pharmacists' perspectives, trust, respectful communication, and proactive information sharing were the primary interpersonal facilitators of collaboration with nursing staff, consistent with the personal antecedents domain of the Stutsky and Laschinger (2014) framework, which empirically identified trust, communication skills, and cooperation as significant predictors of ICP.¹³ A Norwegian study similarly identified trust and continuity as significant factors for successful interprofessional collaboration between healthcare professionals.¹⁸

The reliance on informal channels and extra-role behaviors, while positively perceived by participants as expressions of professional commitment, may also indicate a deeper structural fragility: collaboration sustained by individual initiative rather than institutional design is vulnerable to staff turnover, interpersonal tensions, and ward-level variability. In contrast, many advanced healthcare systems maintain formal, institutionally supported communication infrastructures. In the United Kingdom's National Health Service (NHS), for instance, pagers (bleeps) remain firmly embedded as a sanctioned, albeit outdated, tool for clinical coordination.¹⁹ The Stutsky and Laschinger framework is instructive in this regard. Support structures, defined as the physical space, time, policies, and formal mechanisms that facilitate interprofessional dialogue, were a significant situational predictor of ICP.¹³ When such structures are absent, pharmacists may compensate through informal channels and extra-role behavior, creating an appearance of functional collaboration that is in reality contingent on individual initiative.

This interpretation is supported by evidence from the Iraqi context. An Iraqi qualitative study found that many of pharmacists felt the nurse-pharmacist relationship required improvement, with many bearing responsibilities and burdens that exceeded their formal capacities and

duties.²⁰ An Iraqi mixed-methods study further argued that developing standardized job descriptions for pharmacists is the primary regulatory reform needed to unify their efforts and reduce role disparities across public hospitals in Iraq.²¹ A 2025 UK study in an Older People's Medicine department introduced WhatsApp across eight teams, boosting communication from 5% to 100%, teamwork from 26% to 84%, and well-being from 47% to 84%. About 90% saw a positive impact on patient safety, and all doctors recommended it for future residents.²² The study shows that formalizing informal messaging into a structured team system can greatly improve communication, teamwork, patient care, and staff well-being.

4.2. Structural and organizational barriers constrain collaboration

Beyond interpersonal factors, participants described a range of structural and organizational barriers that consistently limited meaningful collaboration with nursing staff. Involving, inadequate staffing reduced time available for interaction, physical separation between pharmacy and nursing workstations limited spontaneous communication, and the absence of electronic systems added logistical burdens that further constrained collaborative opportunities. This mutually reinforcing pattern is consistent with international evidence demonstrating that organizational factors such as workload, staffing shortages, and inadequate infrastructure are universal barriers to effective interprofessional collaboration across diverse healthcare settings.^{8,15,23,24} An Iraqi cross-sectional study targeting pharmacists across nine teaching hospitals found that approximately 80% reported moderate levels of stress, with overtime work identified as a significant contributing factor, conditions attributed in part to insufficient technology and tools and an unfriendly hospital environment.²⁵ Another Iraqi mixed-methods study (2025) similarly documented staff shortages and technological limitations as major challenges facing pharmacists in Iraqi public hospitals, noting that the absence of electronic systems led pharmacists to conduct all operations manually, occupying them with logistical tasks rather than clinical collaboration.²¹ A 2026 national review of pharmacy practice in Iraq similarly documented systemic barriers within hospital settings as persistent obstacles limiting clinical integration across the profession.²⁶

These findings also reflect a broader systemic reality. Istepanian (2024) documented that introducing innovative health policies and technologies into Iraq's healthcare sector remains largely absent, with healthcare leaders focusing predominantly on reactive treatment approaches rather than systemic reforms that could support clinical practice.²⁷ This context helps explain why pharmacists in the present study described collaboration as dependent on physical proximity, personal availability, and informal workarounds. In the absence of systems designed to facilitate it, collaboration becomes a function of circumstance rather than design.

4.3. Professional hierarchy and role ambiguity shape communication

Professional hierarchy and seniority differences, rooted in systemic governance gaps and unclear professional boundaries rather than individual deficiencies, were described as barriers to collaboration, with senior nurses perceived as less receptive to guidance from younger pharmacists and some nursing staff interpreting pharmacist input as arrogance or encroachment on their professional territory. These dynamics are consistent with international evidence identifying professional hierarchy and power imbalances as among the most prominent barriers to effective interprofessional collaboration, which is documented that professional hierarchy to reduce the ability of health workers to collaborate, compounded with professional and cultural silos that hinder the sharing of patient information and the delivery of integrated care.^{23,24} These tensions reflect a mirrored dynamic between both professions. While pharmacists reported defensiveness from senior nurses, our companion study found that two-thirds of nurses felt

deterred by perceived pharmacist condescension and rigidity. This hierarchy often led nurses to bypass pharmacists for physicians, showing how bidirectional communication barriers reinforce silos and compromise medication safety.²⁸

Role ambiguity further compounded these dynamics. Participants described overlapping responsibilities between pharmacists and nurses, particularly in medication reconciliation and patient education. A Jordanian survey of physicians, pharmacists, and nurses similarly found that medication reconciliation involves overlapping functions across professions, with pharmacists and nurses holding differing views about which profession bears responsibility for specific steps such as documentation and discharge summaries.²⁹ A perceived inequity in institutional accountability was experienced as demoralizing and as a disincentive to asserting clinical authority. Supported by a study conducted in an Indonesian teaching hospital, which reported that the absence of clear standards governing professional authority is perceived by healthcare workers as a barrier to collaboration.²⁴ In the Iraqi context, this inequity may also reflect broader governance failures, where a lack of proper accountability mechanisms and ineffective institutional oversight have allowed differential standards to persist unchallenged,^{27,30} and where the absence of adequate regulations leaves pharmacists without clearly defined roles and responsibilities, with pharmacy managers identifying standardized job descriptions as a necessary solution to address this gap and improve pharmacy services.²¹

A particularly prominent pattern was the authority deficit: in the absence of a legal framework formally recognizing pharmacist clinical authority, nursing staff could not act on pharmacist guidance without formal physician documentation, and pharmacists retreated into narrowly defined scopes of practice out of fear of legal consequences. This defensive posture reflects participants' perception of an absence of a legal framework that formally recognizes and protects the pharmacist's clinical authority. In the absence of such perceived protection, both pharmacists and nurses were described as operating in a legally ambiguous space, and pharmacists cannot intervene beyond their formally documented duties without exposing themselves to legal consequences. Similarly, an Iraqi study (2021) reported that fear of punishment led to significant underreporting of errors among nurses, a finding consistent with the legal concerns described in the present study.³¹ A systematic review of pharmacist prescribing in Middle Eastern countries found that implementation of expanded pharmacist roles remains limited by the absence of legal frameworks, insufficient clinical training, and weak interprofessional collaboration.³² A regional study evaluating clinical pharmacy services across Saudi Arabian hospitals similarly found that organizational and legislative barriers, including lack of authority and need for external approvals, directly limited pharmacists' clinical engagement.³³

In the Iraqi context, these challenges are compounded by a deficit of law enforcement and insufficient central governmental control that exposes healthcare professionals to situational risks within a system characterized by weak regulatory frameworks and inadequate oversight.^{30,34} The conditions under which pharmacists in the present study described retreating into narrowly defined scopes of practice to avoid legal exposure. An Iraqi cross-sectional study found that pharmacists reported the highest knowledge and practice scores regarding medication safety among healthcare professionals, yet overall practice scores remained suboptimal across all groups, a gap the authors attributed to systemic barriers rather than individual competency deficits.³⁵ When clinical knowledge cannot be enacted due to absent legal frameworks and undefined professional authority, the perceived contribution of interprofessional collaboration to medication safety remains constrained by systemic barriers.

4.4. Implications for policy, education, and hospital systems

The findings suggest four candidate priorities warranting further implementation evaluation, corresponding to the structural changes

participants themselves proposed and addressing the support structures that the Stutsky and Laschinger (2014) framework identifies as an important lever for strengthening ICP.¹³

First, as a potential strategy, infrastructure and digital reforms could include implementing electronic prescribing systems and establishing dedicated medication rooms where pharmacists and nurses jointly oversee preparation. An arrangement already operational in one participating hospital. A comparable arrangement has been shown elsewhere to reduce a high baseline rate of intravenous medication preparation errors to a minimal level, supporting the potential benefit of this change.³⁶

Second, organizational support and role clarification: a formal legal framework defining pharmacists' clinical authority, standardized job descriptions, and impartial accountability mechanisms, directly addressing the authority deficit and accountability asymmetry identified in this study.

Third, standardizing clinical collaboration through structured interprofessional communication channels, including multidisciplinary ward rounds, double-checking protocols for high-alert medications, and formal handover procedures, would shift the informal, personal-initiative-based communication described throughout this study toward institutionally embedded practice. A Swiss quality improvement project demonstrated that such structured interprofessional rounds generate substantial pharmacist-led interventions with high acceptance rates.³⁷

Fourth, interprofessional education and leadership development, this is particularly important given evidence that pharmacy education in Iraq relies heavily on traditional teaching methods, leaving newly graduated pharmacists insufficiently prepared for collaborative clinical roles.³⁸ Structured joint training has been shown locally to produce substantial gains in practice from 12.5% to 59% correct technique following a pharmacist-led program for nurses in Baghdad,³⁹ with similar gains observed in a Kirkuk oncology unit, though sustained impact required ongoing reinforcement rather than one-time training.⁴⁰ A multinational scoping review of 29 studies identified promoting interprofessional education and training as a key facilitator for effective teamwork.²³ Furthermore, coordination and leadership roles should be filled based on relational competence and experience rather than seniority alone.⁴¹

Together, these reforms would shift collaboration from the informal, relationship-dependent model described throughout this study toward the institutionally embedded collaboration the framework identifies as an important predictor of ICP outcomes.

4.5. Limitations

This study has several limitations. Data were collected exclusively from pharmacists, so findings represent a single-profession perspective on an interprofessional relationship; statements about nurses' attitudes and behaviors reflect pharmacists' perceptions rather than independently verified accounts, and nurses may characterize these interactions differently. Responses may have been subject to social desirability bias. In addition, seven of the 36 interviews were documented through written notes rather than audio recordings, which, despite immediate participant verification, may have introduced some inconsistency in the depth of data captured relative to the recorded interviews. Finally, geographic concentration in two provinces may limit the generalizability of findings across Iraq. However, since pharmacist appointments, medication supply chains, operational regulations, and salary structures are centrally governed by the Ministry of Health across all public hospitals, the core structural and regulatory conditions described in this study are likely representative of the broader Iraqi public hospital context. Transferability is therefore supported by contextual similarity rather than assumed nationwide uniformity; nonetheless, readers are encouraged to consider that some variation in local culture may exist when interpreting these findings in other settings.

5. Conclusion

From the perspective of pharmacists working in Iraqi public hospitals, collaboration with nursing staff was sustained largely through individual trust, informal communication channels, and personal initiative, in the absence of the institutional support structures that the Stutsky and Laschinger ICP framework identifies as an important situational predictor of ICP in addition to personal factors. Structural barriers, including limited resources, staffing shortages, and the absence of electronic systems, combined with professional hierarchy, role ambiguity, and the absence of a legal framework recognizing pharmacists' clinical authority, left both professions navigating collaboration cautiously and without formal protection. Hospital-level changes that could strengthen collaboration include clearer role policies, structured interprofessional communication, shared medication spaces, electronic documentation systems, and joint interprofessional training.

Declaration of generative AI and AI-assisted technologies in the manuscript preparation process

During the preparation of this work, the author used DeepSeek to improve the language and readability of the manuscript. After using this tool, the author reviewed and edited the content as needed and took full responsibility for the content of the published article.

CRedit authorship contribution statement

Zainab Hilal Al-Muramadhi: Writing – original draft, Visualization, Validation, Software, Methodology, Investigation, Formal analysis, Data curation. **Ali Azeez Al-Jumaili:** Writing – review & editing, Visualization, Validation, Supervision, Project administration, Methodology, Investigation, Formal analysis, Conceptualization. **Mohammed Baqer Al-Jubouri:** Writing – review & editing, Visualization, Validation, Supervision, Investigation.

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Declaration of competing interest

The authors declare the following financial interests/personal relationships which may be considered as potential competing interests:

Ali Azeez Al-Jumaili reports was provided by University of Baghdad College of Pharmacy. One of the co-authors serves as an editorial board member and acts as a reviewer for other manuscripts submitted to the same journal.

Given his role as editorial board member, he had no involvement in the peer review of this article and had no access to information regarding its peer review. Full responsibility for the editorial process for this article was delegated to another journal editor." If there are other authors, they declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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Appendix A. Semi-structured interview guide for hospital pharmacists

Interprofessional Collaboration for Medication Safety: Pharmacist Perspectives

Note: The interview guide was organized into ten thematic sections aligned with the constructs of the Stutsky and Laschinger Interprofessional Collaborative Practice (ICP) Framework, in addition to an introductory demographics and consent section and a closing prompts section. Questions were designed to elicit pharmacists' experiences, perceptions, and recommendations regarding collaboration with nurses in relation to medication safety.

No.	Interview Question
Section A — Consent and Demographics	
–	Please read the consent script and record verbal consent. Record demographics: age; gender; professional role; years of experience; main ward/unit.
Section 1 — Personal Factors	
1	How important do you consider collaboration with nurses for ensuring medication safety? Particularly to prevent administration errors.
2	Are you willing to undertake tasks or adjustments beyond your formal duties to prevent medication errors? Please explain.
3	Can you describe an instance where trust (or lack of trust) between you and a nurse influenced a medication-related decision?
4	How do you typically coordinate with nurses when addressing potential medication problems?
5	How would you rate the clarity and timeliness of communication with nursing staff regarding prescriptions and administration?
Section 2 — Situational Factors	
6	To what extent does hospital leadership support pharmacist–nurse collaboration for medication safety?
7	Are there formal policies, common time allocations, or systems that enable you to collaborate with nurses on medication safety? Please describe.
Section 3 — Interprofessional Collaborative Practice (ICP) Dimensions	
8	How clear are the roles of pharmacists and nurses here in prescribing, dispensing, and administration? Is there a conflict of duties, or does each profession have its own clear responsibilities (e.g. providing medication reconciliation before hospital discharge)?
9	How often do you proactively share medication-related clinical information with nurses, and how is it received?
Section 4 — Consequences and Outcomes	
10	How effective is the pharmacist–nurse team in preventing medication errors in your ward or unit?
11	In your view, has collaboration with nurses reduced medication errors or improved patient safety? Please provide examples.
12	Have you experienced conflicts with nurses about administration method? If yes, how were they resolved?
Section 5 — Barriers and Challenges (Structural & Workflow)	
13	What are the main structural or workflow-related barriers that limit effective collaboration with nurses on medication safety?
14	Is your collaboration with nurses to prevent medication errors negatively affected by resource-related factors (such as time, staffing, appropriate space or rooms, and electronic systems)? How?
Section 6 — Barriers and Challenges (Interpersonal & Policy)	
15	Do factors such as hierarchy, communication habits, or trust affect your collaboration with nurses? Please explain.
16	Are there policy or governance obstacles (unclear protocols, limited authority, weak reporting) that hinder pharmacist–nurse collaboration?
Section 7 — Recommendations: Immediate Practical Actions	
17	What immediate, practical actions could be implemented to strengthen day-to-day collaboration with nurses and reduce medication errors? (Via phone or in person)
18	Are there simple workflow changes—such as standardized handovers or joint double-checking of high-risk medications—that could be introduced (for example, during morning rounds or at the time of medication administration)? Please specify.
Section 8 — Recommendations: Training and Capacity Building	
19	What interprofessional training or capacity-building activities (joint workshops, shared rounds) would best improve teamwork with nurses?
Section 9 — Recommendations: Systems, Tools, and Leadership	
20	What system-level changes or tools (electronic prescribing, checklists, reporting mechanisms) would most help prevent medication errors through better collaboration?
21	What policy should hospital management prioritize to enhance pharmacist–nurse collaboration (role clarity, leadership collaboration)?
Section 10 — Recommendations	
22	What long-term strategies would foster a sustained culture of interprofessional collaboration focused on medication safety?
23	How would you rate your overall collaboration with the hospital nursing staff based on your experience?
24	What achievements do you take pride in that were accomplished in collaboration with the nursing staff?
Closing Prompts	
25	Is there anything else you would like to add about challenges or recommendations to improve collaboration with nurses for medication safety?
26	Can you suggest any colleagues (pharmacists or nurses) who would be willing to be interviewed for this study? (If yes, record names/contacts only with consent.)

ICP = Interprofessional Collaborative Practice.

Appendix B. Supplementary data

Supplementary data to this article can be found online at <https://doi.org/10.1016/j.rcsop.2026.100844>.

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