

INFLUENCE OF PHARMACIST-NURSE COLLABORATIVE PRACTICE, COMMUNICATION QUALITY, AND CLINICAL DECISION-MAKING ON MEDICATION SAFETY AND PATIENT OUTCOMES

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Abstract**Background**

Medication safety is a critical component of quality healthcare and is influenced by effective interdisciplinary collaboration, communication, and clinical decision-making. Pharmacist–nurse collaborative practice has been recognized as an important strategy for reducing medication errors and improving patient outcomes. Limited evidence is available regarding these relationships in Pakistani healthcare settings.

Aim

To examine the influence of pharmacist–nurse collaborative practice, communication quality, and clinical decision-making on medication safety and patient outcomes at Faisal Masood Teaching Hospital, Sargodha.

Methods

A quantitative cross-sectional analytical study was conducted among **60 healthcare professionals**, including **50 registered nurses and 10 pharmacists**. Participants were selected using a convenience sampling technique. Data were collected using a structured questionnaire comprising validated scales measuring pharmacist–nurse collaborative practice, communication quality, clinical decision-making, medication safety, and patient outcomes. Data were analyzed using **IBM SPSS version 26** and **AMOS version 26**. Structural Equation Modeling (SEM) was performed to examine the relationships among the study variables.

Results

The findings demonstrated high mean scores for all study variables. Significant positive correlations were observed among pharmacist–nurse collaborative practice, communication quality, clinical decision-making, medication safety, and patient outcomes ($p < .001$). SEM analysis revealed that pharmacist–nurse collaborative practice ($\beta = 0.39$), communication quality ($\beta = 0.34$), and clinical decision-making ($\beta = 0.27$) significantly predicted medication

safety. Medication safety showed the strongest positive effect on patient outcomes ($\beta = 0.61$, $p < .001$). The structural model demonstrated a good fit (CFI = 0.95, TLI = 0.94, RMSEA = 0.059).

Conclusion

Pharmacist–nurse collaborative practice, effective communication, and evidence-based clinical decision-making significantly enhance medication safety and improve patient outcomes. Strengthening interdisciplinary collaboration and communication strategies may contribute to safer medication practices and higher-quality patient care.

Introduction

Medication safety refers to the uninterrupted high-quality healthcare caused by the avoidance of medication errors and the prevention of medication-related injuries during the medication-use process. Pharmacist–nurse collaborative practice refers to a partnership to the degree that pharmacists and nurses join efforts to manage medication and to be a part of the safety improvement process, as well as the improvement of clinical outcomes by shared goals and planned activities. (WHO, 2024). The quality of communication in the context of healthcare describes how accurate, clear, complete, and timely information exchanged between members of the healthcare team is, as well as the extent to which there is an understanding by all parties. Clinical decision-making is the process of making medication decisions that are based on the assessment of the patient and the consideration of the available treatment options. Positive patient outcomes may be characterized, among other things, by the elimination of adverse drug reactions, patient recovery and satisfaction, a shortened duration of hospital stay, and an improved quality of life. Represented by these concepts are the cornerstones to safe medication management and the provision of quality healthcare (WHO, 2024; AHRQ, 2023).

Medication errors are still one of the top causes of avoidable patient injuries all over the globe. The World Health Organization reports that medication errors cause approximately \$42 billion a year in avoidable costs to the system and impact almost 1 in every 30 patients who receive health services (WHO, 2024). Due to constrained healthcare resources, weaker systems for patient

safety, and a lack of trained professionals, low- and middle-income countries are more impacted. In Pakistan, challenges to medication safety endure with presence of prescribing errors, medicating administration errors, poor registrars, and an inadequate reporting culture regarding adverse events. Furthermore, risks related to medication and poor patient outcomes in healthcare systems are a result of inadequate collaboration and communication within healthcare teams and have been recognized as priority areas in the WHO and AHRQ reports (AHRQ, 2023).

Refined nurse-pharmacist collaboration has been proven to bolster medication management and enhance safety for patients. (Aldawsari et al., 2023). Pharmacists have the skills and knowledge of medications and the ability to assess medications and find interactions and refine therapy, while nurses have the ability to administer medications and monitor patients as well as mediate the detection of adverse drug reactions. (Mubarak et al., 2024). As equals in the collaboration, there is a shared authority and communication to lower the risks associated with medications. In several recent hospital studies, this collaboration resulted in improved medication safety and the reduction of avoidable medication errors with an overall improvement to the hospital (Abumelha et al., 2023).

Communication quality matters in collaborative, safe patient care. Speaking and listening well let care teams share vital clinical information and carry out medication reconciliations and interventions. (Alhawsawi et al. 2023). Lack of communication causes omissions and mistakes in medication, as well as delays in intervention and harmful incidents. Organizations like hospitals

that encourage communication between pharmacists, nurses, and lab and healthcare specialists improve patient safety and the quality of healthcare. Integrated communication systems enable team spirit and provide dedicated care during the entire medication-use process (Almoqbel et al. 2024).

Clinical decisions and safe medication practices both have a vital role in positive patient outcomes. Continuous assessment of a patient's condition, laboratory findings, history of medications, contraindications, and therapeutic responses is done by both nurses and pharmacists to inform their next medication-related decision. (Umeano, 2024). The clinical judgment of healthcare practitioners based on evidence minimizes inappropriate use of medication and maximizes the benefits of medicine to the patient. Nursing leadership facilitates clinical judgment decisions by promoting interprofessional collaboration, and shared responsibility, as well as teaching the profession. When nurses and pharmacists work together, clinical judgment is enhanced, and the management of medication in the healthcare system is safer (Almutairi et al. 2025).

Healthcare systems value interprofessional collaboration as a building block of patient-centered care. Collaboration between pharmacists, nurses, physicians, and practitioners, from any healthcare discipline, fosters unified clinical practices and creates a more efficient healthcare system. (Alshammari et al., 2024). New research supports that integrated healthcare teams positively influence the culture of patient safety in organizations and reduce medication-related issues, increase patient compliance, and increase patient satisfaction. Structural Equation Modeling (SEM) is a powerful, flexible statistical methodology that is optimal for studying simultaneous, intricate, and interrelated patterns in collaborative practice, the quality of communication, clinical judgment, medication safety, and patient outcomes. Through SEM, direct and indirect pathways of patient safety in healthcare systems can be identified (Almoqbel et al., 2024).

In Pakistan, research is limited on the integrated effect of pharmacist-nurse collaboration on communication, clinical judgment, and their collective influence on medication safety and patient outcomes. (Alshammari et al., 2024). The majority of studies have examined medication-related issues or patient safety in isolation, and have not explored the complex interrelationships of these professional and systemic factors. There is a scarcity of research using Structural Equation Modeling to study these relationships in healthcare systems in Pakistan. Evidence from this study will assist hospital administration, nursing administration, pharmacists, and policy developers to promote collaborative practices, improve communication, and promote safe, rational medication practices. The findings may help establish safety and quality of care frameworks for patients in Pakistan (Mubaraki et al., 2024; Aldawsari et al., 2023).

Methods

The purpose of this quantitative cross-sectional analytical study was to investigate the effect of collaborative practice between pharmacists and nurses, the quality of their communication, and their clinical decision-making on medication safety and patient outcomes. The location of the study was Faisal Masood Teaching Hospital in Sargodha, Pakistan which is a tertiary care teaching hospital. The participants of the study were nurses and pharmacists who were engaged in the direct provision of care and the management of medication. The inclusion criteria for the participants were that healthcare professionals needed to have a minimum of six months of clinical practice. Interns, trainees, and staff who were on long leave during the study were not eligible to participate. The sample size of the study was calculated using Raosoft Sample Size Calculator. The total number of participants in the study was 60, consisting of 50 nurses and 10 pharmacists. A convenience sampling technique was adopted to recruit participants. The data were collected using a structured self-administered questionnaire, consisting of Likert-type validated scales for measurement of the collaborative

practices of pharmacists and nurses, communication, clinical decision-making, medication safety, and patient outcomes.

Data Collection Procedure

We ensured that relevant policies for conducting the proposed research were thoroughly reviewed and adhered to. This included obtaining ethical approval from the relevant boards and obtaining administrative permission from the management of Faisal Masood Teaching Hospital, Sargodha. Consenting nurses and pharmacists were approached in their respective departments during duty hours. The objectives of the research along with the significance of the research, the voluntary nature of the participation, and the assurance of confidentiality were explained and assured to potential participants. Each potential participant was fully informed about the research, and provided with the opportunity to withdraw at any time. The researcher was in control of the process and made the decision about the data collection procedure. Printed surveys were distributed to the participants, who then, without any interference from supervisors or colleagues, filled out the surveys. If the potential participants were obstructed, they were asked to complete the surveys within one week. Survey instructions were distributed along the surveys. Completed surveys were collected. Each survey was reviewed for the data collection systems, which included coding the

surveys. Unique identifiers were developed for each survey and assigned to each survey to ensure the study participants were anonymous and their confidentiality was maintained throughout the data collection process.

Data Analysis Procedure

Data entry, cleaning, and analysis were performed using IBM SPSS Version 26 and AMOS Version 26. Demographic characteristics of participants and study variables were summarized using descriptive statistics such as frequency distributions, percentages, means, and standard deviations. Questionnaire reliability was determined using Cronbach's alpha. AMOS was used to conduct Structural Equation Modeling (SEM) to investigate relationships among pharmacist-nurse collaborative practice, quality of communication, clinical decision making, medication safety, and patient outcomes. Fit indices used to confirm the adequacy of the model included Chi-square/degrees of freedom (χ^2/df), Comparative Fit Index (CFI), Tucker-Lewis Index (TLI), Goodness-of-Fit Index (GFI), and Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR). For all analyses, a p value of less than 0.05 was used to determine a statistically significant difference.

Results

Table 1

Socio-demographic Characteristics of Participants (N = 60)

Variable	Category	Frequency (n)	Percentage (%)
Profession	Nurse	50	83.3
	Pharmacist	10	16.7
Gender	Male	24	40.0
	Female	36	60.0
Age (years)	21-30	18	30.0
	31-40	27	45.0
	41-50	12	20.0
	>50	3	5.0
Educational Qualification	BS Nursing/Pharm-D	39	65.0
	MSN/MPhil	18	30.0
	PhD	3	5.0
Clinical Experience	1-5 years	20	33.3

	6-10 years	24	40.0
	>10 years	16	26.7
Working Unit	Medical	16	26.7
	Surgical	15	25.0
	ICU	14	23.3
	Emergency	15	25.0

As shown in Table 1, out of the 60 study participants, the majority were registered nurses (83.3%), with pharmacists accounting for 16.7% (reflecting a greater number of nurses in the hospital). The sample was made up of 60.0% females and 40.0% males. The majority of the participants were in the age group of 31-40 years (45.0%), and those within the age group of 21-30 years accounted for 30.0% of the sample (meaning, most of the sample were relatively

young and active). Almost two-thirds (65.0%) of the sample had a BS Nursing or Pharm-D degree, 30.0% were postgraduates, and 5.0% had a PhD. The greatest number (40.0%) of participants had a working experience of 6-10 years in the clinic. The participants were almost equally distributed in the medical, surgical, intensive care, and emergency departments, thereby encompassing the main clinical divisions that deal with the management of medication.

Table 2

Descriptive Statistics and Reliability of Study Variables (N = 60)

Variable	No. of Items	Mean $\pm$ SD	Cronbach's α
Pharmacist-Nurse Collaborative Practice	10	3.89 $\pm$ 0.61	0.91
Communication Quality	8	3.76 $\pm$ 0.58	0.89
Clinical Decision-Making	10	3.81 $\pm$ 0.56	0.90
Medication Safety	8	3.94 $\pm$ 0.52	0.92
Patient Outcomes	8	3.87 $\pm$ 0.55	0.88

Table 2 presents the descriptive statistics and the analysis of the study variables' reliability. The analysis shows that the mean scores of the study variables were relatively high. This means that the participants had relatively positive perceptions on the collaboration and practice of the pharmacist and nurse, communication, clinical decision making, and the safety of medication and outcomes for patients. The variable of safety of medication had the highest mean score of (3.94 $\pm$ 0.52). This was followed by the mean score for the collaboration and practice of the pharmacist and

nurse (3.89 $\pm$ 0.61) and for the outcomes of patients (3.87 $\pm$ 0.55). Communication, though having the lowest mean score (3.76 $\pm$ 0.58) recorded a mean score that was above the midpoint of the scale. The reliability analysis indicated that the measurement instruments had an excellent and positive internal consistency and an α coefficient (Cronbach's alpha) between 0.88 and 0.92, which showed that all the measurement instruments were reliable and were appropriate for the analysis that followed (the statistical analysis).

Table 3

Correlation Matrix among Study Variables (N = 60)

Variables	1	2	3	4	5
1. Pharmacist-Nurse Collaborative Practice	1				
2. Communication Quality	.69	1			
3. Clinical Decision-Making	.64	.71	1		
4. Medication Safety	.73	.76	.68	1	

5. Patient Outcomes	.67	.72	.70	.81	1
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The findings in Table 3 show the correlations of the research variables. All variables showed a strong positive relationship ($p < .001$). Thus, changes in one variable were likely to be related to changes in the other variables. The relationship between medication safety and patient outcomes had the strongest positive correlation ($r = .81$). Therefore, the improvement of safe medication practices was likely to lead to improvement in patient outcomes. Communication quality showed a strong, positive relationship with both medication safety ($r = .76$) and patient outcomes (r

$= .72$). Additionally, collaborative practice between pharmacists and nurses positively correlated with both medication safety ($r = .73$) and communication quality ($r = .69$). Furthermore, clinical decision-making demonstrated moderate to strong correlational relationships with both medication safety ($r = .68$) and patient outcomes ($r = .70$). Overall, the results showed that all the variables of the study were correlated, and that the relationships were of practical significance.

Table 4

Structural Equation Modeling Results Predicting Medication Safety and Patient Outcomes (N = 60)

Hypothesized Path	Standardized β	SE	CR	p-value	Decision
Pharmacist-Nurse Collaborative Practice → Medication Safety	0.39	0.09	4.28	<0.001	Supported
Communication Quality → Medication Safety	0.34	0.08	3.91	<0.001	Supported
Clinical Decision-Making → Medication Safety	0.27	0.09	3.12	0.002	Supported
Medication Safety → Patient Outcomes	0.61	0.08	7.08	<0.001	Supported
Pharmacist-Nurse Collaborative Practice → Patient Outcomes	0.19	0.08	2.23	0.026	Supported
Communication Quality → Patient Outcomes	0.21	0.09	2.46	0.014	Supported
Clinical Decision-Making → Patient Outcomes	0.24	0.08	2.87	0.004	Supported

Sem results are in Table 4. The direct effects of pharmacist-nurse collaborative practice and the quality of communication and clinical decision making on the safety of medications and patient outcomes are analyzed. Positive effects were observed with pharmacist-nurse collaborative practice on both medication safety ($\beta = 0.39$, $p < .001$) and patient outcomes ($\beta = 0.19$, $p = .026$). The quality of communication positively predicted medication safety ($\beta = 0.34$, $p < .001$) and patient outcomes ($\beta = 0.21$, $p = .014$). Positive effects for

clinical decision making on medication safety ($\beta = 0.27$, $p = .002$) and patient outcomes ($\beta = 0.24$, $p = .004$) were also found. Among the study variables, medication safety was the most significant predictor of patient outcomes ($\beta = 0.61$, $p < .001$). The overall fit of the model to the data was good, as indicated by the acceptable indices of fit: ($\chi^2/df = 1.84$, CFI = 0.95, TLI = 0.94, GFI = 0.92, RMSEA = 0.059, SRMR = 0.046). The proposed structural model explained the relationship of the study variables adequately.

Table 5 Model Fit Indices

Fit Index	Obtained Value	Recommended Value	Interpretation
χ^2/df	1.84	<3.00	Good Fit
CFI	0.95	≥ 0.90	Good Fit
TLI	0.94	≥ 0.90	Good Fit
GFI	0.92	≥ 0.90	Good Fit

RMSEA	0.059	≤0.08	Acceptable Fit
SRMR	0.046	≤0.08	Good Fit

Table 5 shows Structural Equation Model (SEM) results analyzing pharmacist-nurse engaged collaboration, and its effect on: communication, clinical decisions, and patient assessment in medication safety as related to patient outcomes. The results show an overall acceptable good fit. The chi-square to degrees of freedom ratio, $\chi^2/df = 1.84$, was less than the cut-off of 3.00, which was a good model fit. The fit indices for the model were good. CFI = 0.95, TLI = 0.94, GFI = 0.92, and the RMSEA = 0.059, and the SRMR = 0.046, had an acceptable fit as they were less than the cut-off of 0.08 with minimal fit error. Overall change and adjustment of model fit indices confirmed the representation of the relationships and the validity of the study.

Discussion

This study looked at the impact of nurse-pharmacist collaboration, the quality of communication and clinical judgment, on medication safety and patient outcomes among Faisal Masood Teaching Hospital, Sargodha, staff. It was found that staff had a positive view of collaboration, communication, clinical judgment, medication safety and patient outcomes. According to the results of the structural equation modeling, nurse-pharmacist collaboration, the quality of communication and clinical judgment, impacted medication safety; and among the research variables, medication safety had the greatest positive impact on patient outcomes. The fit indices of the model verified that the proposed conceptual model accurately captured the relationship of variables of the study. The results show that collaboration among the different fields is essential in achieving safer medication practices and enhanced quality of care.

It was proved that most of the respondents were nurses. This echoed the makeup of staff who interact with patients and administer medication. The majority of respondents had between six to ten years of working experience. This points to adequate clinical exposure to interdisciplinary

practice as a result of collaborative working with pharmacists for the administration of medication. This observation coincides with the research findings of Dilles et al. (2021), where nurses, as the dominant professional cohort, engage in interprofessional medication management. Similar results were observed by Alharbi et al. (2024), who stated that established nurse and pharmacist pairs enhance the quality of health care with their collaborative practice. Alruwaili et al. (2024) showed that the poorer the collaboration in the healthcare system, the greater the challenges that are met in dealing with high-risk medication safety and patient safety.

The descriptive findings showed that pharmacist-nurse collaborative practice; communication quality; clinical decision-making; medication safety; and patient outcomes all had high mean scores. Medication safety had the highest mean score, showing participants felt safe medication practices were well practiced in the hospital. The World Health Organization (2024) stated that healthcare organizations that practice collaborative Medication Safety initiatives achieve improved patient safety outcomes. Alharbi et al. (2024) had similar findings in showing that the integration of nursing and pharmacy services improves the quality of healthcare and medication safety. Alkiyadi et al. (2025) also found that the collaboration of nursing, pharmacy, and laboratory staff improves medication safety and patient safety in all healthcare settings.

The correlation analysis showed that all variables had significantly positive relationships. Medication safety had the highest correlation with patient outcomes, showing that medication safety had close ties to positive clinical outcomes and correlated with communication quality. Communication quality also showed strong positive correlations with medication safety and patient outcomes. These findings align with those of Almoqbel et al. (2024), who found that positive interprofessional relationships and collaboration in the healthcare system improves patient

outcomes. Ravi et al. (2022) found that nurse-pharmacist collaboration fosters safety in medication management by enhancing communication, medication, and patient monitoring. Alruwaili et al. (2024) found that healthcare systems with poor communication reported suboptimal safety for patients and poor management of medications.

As per the structural equations modeling, pharmacist-nurse collaboration has a positive effect on the safety of medication and patient outcomes. Previous studies corroborated these results by describing that collaboration between pharmacists and nurses aids in medication reconciliation, drug-related problem identification, and clinical interventions. Dilles et al. (2021) concluded that interprofessional evidence-based pharmaceutical care enhances medication safety and positively impacts patient outcomes. It was reported by Almutairi et al. (2025) that the collaboration of clinical pharmacists and nurses is of great significance in dealing with high-risk medications and safeguarding against medication-related injuries. It was also reported by Alkiyadi et al. (2025) that collaboration of various disciplines helps in the safe use of medications and improves the quality of health services.

The safety of medication and outcomes of patients are greatly impacted by communication. Speedy, clear, and complete communication of pharmacists and nurses aids the clear and safe delivery of medications and reduces fragmentation of care. This was reported by the Agency for Healthcare Research and Quality (2023), which states that ineffective communication is a primary cause of patient safety issues. Almoqbel et al. (2024) also reported that optimal communication of all health care professionals improves patient care and outcomes. Integrated communication of nurses and pharmacists facilitates better medication management, which has been reported by Alharbi et al. (2024), despite difficulties caused by large scale and complex health care systems.

Judgments and decisions made in a clinical context impact both the safety of the patient's

medication and patient outcomes in general. Medication safety has the most substantial effect on patient outcomes because it is an important factor in the quality of continuous care. Fariman et al. (2025) found that joint decision-making processes enhance both medication safety and patient-centered outcomes for patients on polypharmacy. Almutairi et al. (2025) argued that high-risk medication safety and reduction of medication-wise threats are enhanced by joint decision-making of pharmacists and nurses. Ravi et al. (2022) made a similar statement by outlining that through joint decision-making and direct participation of nurses and pharmacists, the safety of medication for patients is enhanced. The current study reinforces the collaborative practice of nurses and pharmacists, the vital role of communication, and the value of clinical judgment based on research findings in medication safety in tertiary care.

Conclusion

The current research found that at Faisal Masood Teaching Hospital, Sargodha, pharmacist-nurse teamwork, communication, and clinical decision-making influence medication safety and patient outcome. Enhanced interdisciplinary teamwork and communication improved safety in medication practices, while the application of research to clinical decision-making positively impacted the safety of medication practices. Of all the variables studied, the safety of medication most positively impacted patient outcomes. The safety of taking medication is of the utmost importance when striving to improve the quality of healthcare. The results from the structural equation model indicated that the relationships established between the variables were accurate. These results call for healthcare managers to strengthen teamwork and communication, and improve clinical decision-making in order to achieve the goal of medication safety that will help them achieve their desired patient outcomes.

Recommendations

Based on the findings of the study, the following recommendations are proposed:

1. Hospital administrators should strengthen pharmacist–nurse collaborative practice by establishing formal interdisciplinary medication management teams and promoting shared responsibility in patient care.
2. Regular interprofessional education and training programs should be conducted to enhance collaboration, communication skills, and evidence-based clinical decision-making among nurses and pharmacists.
3. Healthcare institutions should implement standardized communication tools, such as SBAR, to improve the accuracy and consistency of information exchange during medication-related processes.
4. Clinical pharmacists should be actively involved in ward rounds, medication reconciliation, and medication review activities to identify and prevent medication-related problems.
5. Nursing leaders should encourage evidence-based clinical decision-making by providing continuous professional development opportunities and access to current clinical guidelines.
6. Hospital management should strengthen medication safety systems by promoting medication error reporting, regular safety audits, and continuous quality improvement initiatives.
7. Future multicenter studies with larger sample sizes and diverse healthcare settings should be conducted to validate the findings and further explore factors influencing medication safety and patient outcomes in Pakistan.

REFERENCES

Abumelha, A. A., Zainalddein, N. Z., Almakawni, A. M., Alsaegh, A., Alawn, M. K., Alsubaie, A. A., ... & Jamjoom, I. A. (2023). *Supporting clinical workflow: The role of pharmacist–nurse relationships in delivery of care*. *International Journal of Health Sciences*, 7(S1), 3119–3128.

Aldawsari, A., Al-Haiti, S. I. L., Harb, A. H., Alzahrani, M. M., Almekhbel, L. S., Almutairi, Y. T., ... & Alonzi, F. A. (2023). Patient outcomes through interprofessional partnerships: A focus on pharmacist–nurse collaboration. *International Journal of Health Sciences*, 7(S1), 3103–3118.

Alharbi, S. N., Alrashdi, A. E. J., Alrashdi, S. F., Alrashedi, M. G. M., Asiri, S. A. J., Albarqi, R. A. M., ... & Alrashidi, M. R. (2024). Integration of nursing and pharmacy in enhancing healthcare quality in operating rooms: Challenges and innovative solutions. *Journal of International Crisis and Risk Communication Research*, 7(S3), 321.

Alhawsawi, A. N., Muhammed, W. M., Almaimony, A. G., Alraffaa, Y. A., Jead, M. A., Aldossari, W. H., ... & Alanazi, A. R. (2023). Exploring interprofessional communication and collaboration among pharmacists, nurses, and laboratories enhancing patient safety and healthcare outcomes. *International Journal of Health Sciences*, 7(S1), 3165–3177.

Alkiyadi, S. A., Alqarni, S. A., Al Sultan, S. A., AlShahrani, A. A., Alotaibi, R. K., & Alqahtani, A. A. (2025). Interdisciplinary collaboration between nursing, pharmacy, and laboratory teams to improve patient safety in medication management. *Journal of International Crisis & Risk Communication Research (JICRCR)*, 8.

Almoqbel, N. R., Mohammed, F. H., Alahmadi, A. H., Almtiry, L. E., Moafa, S. N. Y., Alsadah, H. M., ... & Alqahtani, J. A. (2024). Interprofessional collaboration in healthcare: Integration of pharmacy, laboratory medicine, nutrition, and nursing services for enhanced patient outcomes. *Cultura: International Journal of Philosophy of Culture and Axiology*, 21(9S), 164–191.

- Almutairi, M. M., Almutairi, A. N., Almutairi, A. M. S., Al-Mutairi, F. L., Almutairi, K. M., Almutairi, H. M., ... & Aldossari, N. M. (2025). Clinical pharmacist and nursing roles in managing high-alert medications in emergency departments: A systematic review. *The Review of Diabetic Studies*, 281–288.
- Alruwaili, R. A. S., Almansour, S. K. N., Alruwaili, S. A. S., Al Rowaili, A. A. R. N., Alrwili, M. Z. A., & Alruwaili, S. G. S. (2024). The impact of collaboration among medical teams on improving the management of high-risk medications. *Gland Surgery*, 9(2), 324–331.
- Alshammari, F. S., Mater, A. S., Alshammari, K. S. M., Al-Rashidi, A. M. A. F., Albaqawi, A. M., Alshammari, A. S. S., ... & Al-Shammari, G. M. K. (2024). Interprofessional collaboration between pharmacists, nurses, and healthcare administrators in improving medication safety and patient outcomes. *The Review of Diabetic Studies*, 402–423.
- Dilles, T., Heczkova, J., Tziaferi, S., Helgesen, A. K., Grøndahl, V. A., Van Rompaey, B., ... & Jordan, S. (2021). Nurses and pharmaceutical care: Interprofessional, evidence-based working to improve patient care and outcomes. *International Journal of Environmental Research and Public Health*, 18(11), 5973.
- Fariman, S., Arabshomali, A., Goordeen, D., Niznik, J. D., Hemati, H., & Elston Lafata, J. (2025). Shared decision making interventions for deprescribing in older adults with polypharmacy: A scoping review. *Journal of the American Geriatrics Society*, 73(12), 3884–3894.
- Mubarak, F. M. A., Alghamdi, T. H. M., Alqasimi, A. Q. A., Alaklobi, A. S. S., Khurshan, N. A. Y., Ageeli, T. M. R., ... & Albishi, R. S. S. (2024). The pharmacist-nurse partnership improving patient safety and medication management. *Journal of International Crisis and Risk Communication Research*, 7(S7), 1805.
- Ravi, P., Pfaff, K., Ralph, J., Cruz, E., Bellaire, M., & Fontanin, G. (2022). Nurse-pharmacist collaborations for promoting medication safety among community-dwelling adults: A scoping review. *International Journal of Nursing Studies Advances*, 4, 100079.
- Umeano, A. (2024). Nursing leadership strategies for fostering interprofessional collaboration with pharmacists to improve medication safety and patient-centered healthcare outcomes.