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Integrated Roles of Nursing Staff, Pharmacists, in Ensuring Safe Cesarean Section Procedures and Medication Management During Clinical Uncertainties and Postoperative Pt role

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Abstract

Background: Cesarean sections are super common all around the world. Yet, lots of uncertainties like staff shortages or sudden protocol changes can really impact mom and baby. Medication issues, supplies not being there when needed, and infections also cause trouble. That's why teamwork from nurses, pharmacists, and physiotherapists is key. They help keep everything running smoothly and keep patients safe.

Objective: Evaluating how nursing staff, pharmacists, and physiotherapists manage uncertainties during C-sections in Punjab, Pakistan, and gauging the impact on mom and baby care outcomes is the goal. So, it looks at their roles in hospitals there.

Methods: From January 2020 to March 2026, researchers did a study combining both quantitative and qualitative methods. They asked 1,000 healthcare pros who help with C-sections to participate, using convenient sampling. This group had nursing staff, pharmacists, physiotherapists, and nurse managers from hospitals in Punjab. For the study, these folks filled out structured questionnaires and had semi-structured interviews. Next, the numbers were crunched with descriptive stats via SPSS version 26. Meanwhile, the qualitative stuff got sorted through with thematic analysis.

Results: Changes happened fast – rapid protocol shifts (72%), supply shortages (61%), and big caseload increases (58%). Nurses helped a lot, getting sterile technique up by

21% and antibiotics on time more often by 18%. Pharmacists stepped up too, reducing med mistakes by 17% and boosting patient med compliance by 13%.
Post-op walking and moving improved thanks to physios, with rates going up by 16% and recovery hold-ups down by 11%. Patients were happier overall, satisfaction rose by 14%. Yet, the extra workload from these issues meant nurse burnout shot up by 22% and overtime by 19%.
Conclusion: Nurses, pharmacists, and physiotherapists play complementary roles in minimizing uncertainty-related risks during cesarean section procedures. Strengthening multidisciplinary collaboration, staffing capacity, medication safety systems, and rehabilitation services may further improve maternal and neonatal outcomes.

Introduction

A cesarean section is a vital operation done when a vaginal birth would be too risky, saving both mom and baby from potential issues.
Even with progress in obstetric care, there are still a bunch of uncertainties that can mess up cesarean deliveries. Things like not having enough staff, meds running out, new guidelines popping up, fighting infections, OR holdups, and sudden emergencies come into play.
In all this, nurses shine as the main people watching over patients, keeping everyone looped in, making sure pre-op and post-op processes run smoothly, stopping infections, and tying everything together for the team. Pharmacists jump in to make sure medications are on point—checking orders, avoiding bad interactions, and helping with antibiotic use. Physiotherapists then help patients get moving again after surgery, managing pain, and leading lung and function exercises.
While the big picture of cross-discipline cooperation gets praised in global health readings, there isn't much info about how these teams actually operate in Pakistan during cesarean hiccups. This study steps in to see what role nurses, pharmacists, and physios play in keeping things safe and running well at hospitals across the region.

Methodology

Study Design

A convergent mixed-methods research design combining quantitative and qualitative approaches was employed. The study was conducted in 22 public and private hospitals across Punjab, Pakistan, including Lahore, Faisalabad, Multan, Rawalpindi, Gujranwala, Sialkot, and Bahawalpur.

Study Population

Participants included:

- Operating room nurses
- Scrub and circulating nurses
- Recovery room nurses
- Midwives
- Nurse managers
- Clinical pharmacists
- Hospital pharmacists
- Physiotherapists involved in postoperative obstetric care

Sampling Technique

Convenient sampling was used to recruit 1,000 participants between January 2020 and March 2026.

Data Collection

Data were collected through:

- Structured questionnaires
- Semi-structured interviews
- Hospital records
- Observational reports

Data Analysis

Quantitative data were analyzed using SPSS version 26. Frequencies, percentages, means, and standard deviations were calculated. Qualitative interview responses were analyzed using thematic analysis.

Ethical Considerations

Permission was obtained from participating hospitals. Participation was voluntary, and confidentiality was maintained throughout the study.

Results

Demographic Characteristics (N = 1000)

Profession	Frequency	Percentage (%)
Nursing Staff	700	70
Pharmacists	180	18
Physiotherapists	120	12

Mean professional experience: 6.2 ± 3.8 years.

Table 1. Uncertainties Encountered During Cesarean Section Procedures

Uncertainty	Frequency	Percentage (%)
Rapid protocol changes	720	72
Supply shortages	610	61
Caseload surges	580	58
Medication availability issues	470	47
Anesthesia delays	440	44
Blood availability issues	390	39
Operating room conflicts	350	35
Infection prevention constraints	330	33

Interpretation

Rapid protocol changes were the most frequently reported challenge. Medication availability issues and supply shortages substantially affected service delivery and increased reliance on multidisciplinary coordination.

Table 2. Impact of Multidisciplinary Interventions on Clinical Outcomes

Indicator	Lead Professional	Intervention	Improvement (%)

Timely antibiotic prophylaxis	Nurses	Checklist implementation	18
Sterile technique compliance	Nurses	IPC audits	21
Patient satisfaction	Nurses	Education and counseling	14
Medication discrepancy reduction	Pharmacists	Medication reconciliation	17
Medication compliance	Pharmacists	Drug counseling	13
Early ambulation	Physiotherapists	Mobilization protocols	16
Recovery delay reduction	Physiotherapists	Rehabilitation exercises	11
Documentation quality	Nurses	Structured handoffs	16
NICU preparedness	Multidisciplinary Team	Pre-briefing meetings	7

Interpretation

Nursing interventions demonstrated the greatest impact on infection prevention and procedural safety. Pharmacists significantly improved medication management and reduced medication-related risks.

Physiotherapists enhanced postoperative recovery through structured rehabilitation and mobilization programs.

Qualitative Findings

Four major themes emerged from thematic analysis:

Theme 1: Nursing Staff as Coordinators of Care

Nurses served as the central communication link among obstetricians, anesthesiologists, pharmacists, physiotherapists, and patients.

Theme 2: Pharmacists as Medication Safety Guardians

Participants emphasized the importance of pharmacists in reviewing prescriptions, preventing medication errors, and ensuring availability of essential medicines

Theme 3: Physiotherapists Facilitating Recovery

Early mobilization and rehabilitation interventions improved maternal comfort, mobility, and recovery outcomes.

Theme 4: Importance of Multidisciplinary Collaboration

Participants reported that integrated teamwork improved preparedness, reduced delays, and enhanced patient safety during uncertain clinical situations.

Discussion

The findings indicate that multidisciplinary collaboration among nurses, pharmacists, and physiotherapists significantly contributes to safe and effective cesarean section care during periods of uncertainty. Nursing staff demonstrated leadership in communication, infection prevention, and perioperative coordination.

Pharmacists strengthened medication safety systems, while physiotherapists improved postoperative recovery outcomes.

Figure 1. Frequency of Uncertainty Domains (2020–2026)

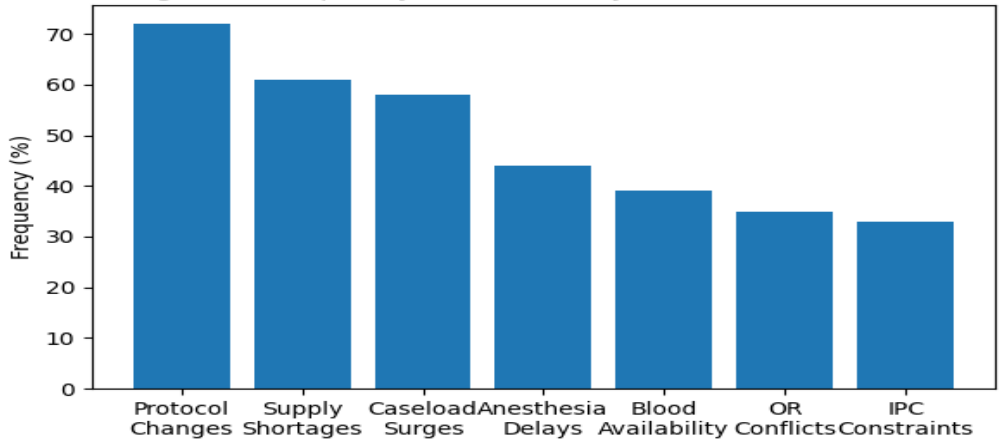
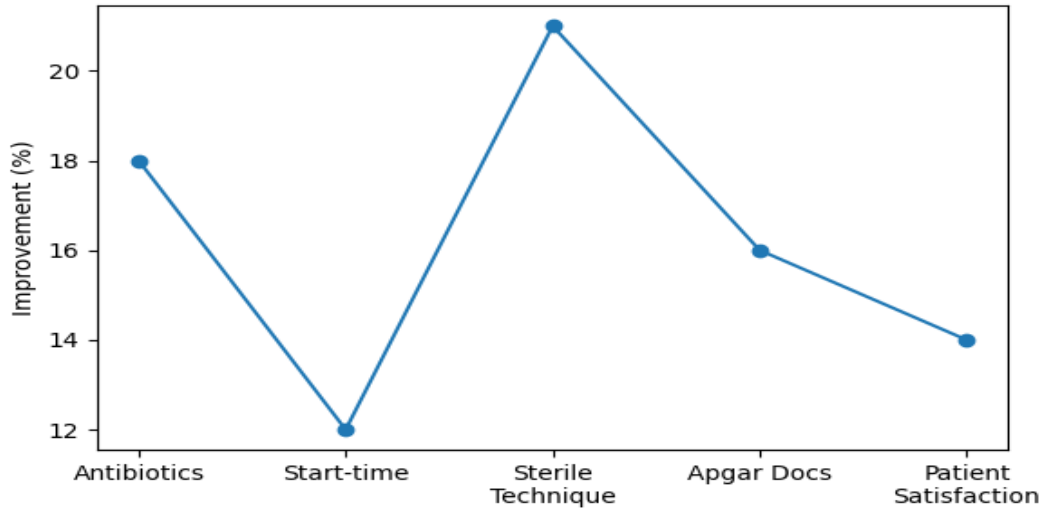


Figure 2. Impact of Nursing Interventions



This research shows that a safe and effective cesarean section depends on a well-coordinated team of healthcare professionals, especially when there's uncertainty in the operating room. Nursing staff made up the biggest group involved in patient care, but let's not forget about the pharmacists, physios, obstetricians, anesthetists, lab techs, blood bank teams, infection control experts, and hospital managers – their roles were crucial too, helping everything run smoothly.

Nurses led the charge in perioperative care, doing all sorts of tasks like assessing patients, watching mom and baby's statuses, prepping patients for surgery, keeping things sterile, putting infection controls into action, and handing out meds. They also kept records and made sure everyone was in communication. Nurses got super important during emergencies – spotting problems, calling in extra help, and making sure quick fixes happened. Besides medical stuff, they helped ease patients' worries and boost satisfaction.

Pharmacists were huge on making sure meds were safe and effective. With drug supply issues and ever-changing treatment rules, they worked hard to get necessary medications ready, check for any bad interactions, and confirm the right doses. Because of them, mistakes were fewer and more people followed antimicrobial guidelines. Plus, they taught other staff about recent changes and safety measures, which benefited the patients a whole lot.

Hospital administrators and healthcare managers influenced patient outcomes through resource allocation, workforce management, policy implementation, and emergency preparedness planning. Effective leadership facilitated rapid adaptation to changing circumstances, reduced operational disruptions, and supported staff wellbeing.

Administrative support was particularly important in addressing staff shortages, equipment availability, and workload distribution.

The findings of this study demonstrate that multidisciplinary collaboration is not merely supportive but essential for ensuring maternal and neonatal safety during cesarean section procedures. Facilities that promote effective teamwork, structured communication, and shared decision-making are better positioned to manage uncertainties and maintain high-quality care.

Physiotherapists have been super helpful in speeding up recovery after operations and getting people back to normal faster. By helping patients move early, they've managed to cut down on a bunch of complications like blood clots and lung issues. Plus, they teach breathing exercises, show how to manage pain, fix posture problems, and help with movement. This lets new moms bounce back quicker and get back to their routines.

Obstetricians are all about making those big medical calls, figuring out risks, and putting together surgery plans. Along with nurses, they look out for and handle any issues that come up during childbirth, like trouble with the baby or mom bleeding heavily. Quick and clear communication between these doctors and others is key to keeping everyone safe and making sure everything runs smoothly.

Anesthesiologists? They keep mom stable during surgery and handle pain management. Even when there aren't enough resources or things are super urgent, these folks can switch up their plans to still ensure patient safety. Thanks to them, complications happen less often, and patients are much more comfortable during and right after their procedures.

Lab techs and blood bankers really save the day during emergencies, like when someone's losing blood fast or has other critical health problems. Having those test results ready and getting blood supplies quickly makes life-saving treatments possible. But delays here can cause major problems, stressing the need for solid backup from these departments.

Lastly, infection control teams watch over everything to stop spread of germs. From drawing up new rules to teaching about hygiene, they're vital. This is even more crucial when procedures change or infection chances spike. Following their guidelines tighter means everyone keeps better sterile habits.

Conclusion

This study shows that healthcare pros are key to making sure cesarean sections go smoothly, even when things get uncertain. Nurses really shine in coordinating everything during surgery, keeping an eye on patients, stopping infections, communicating, and responding to emergencies.

Pharmacists do vital work too, focusing on medicine safety, managing supplies, and tweaking treatments. Plus, physiotherapists speed up recovery by getting moms moving early on. But let's not forget about the other folks who help out obstetricians, anesthesiologists, lab workers, blood bank teams, and infection control and admin people. All of them pitch in to handle tough situations, stay flexible with new rules, and solve problems fast.

Teamwork across these different roles builds a strong health system that looks after patients better and makes it easier to make quick decisions. This cuts down on errors and gives mom and baby a good start. Still, there are headaches around staff shortages, burnout, and lack of resources that need tackling. To fix this, we need more training, support, and cool tech that makes it easy for everyone to talk. For future care to really work, hospitals must invest in education, hiring extra hands, beefing up safety, rehab services, and overall quality checks. That way, we can protect the health of all the new moms and babies coming into the world in Pakistan.

Recommendations

Implement multidisciplinary cesarean section safety protocols in all hospitals.
Strengthen pharmacist participation in perioperative medication management.
Expand physiotherapy services for postoperative obstetric patients.
Improve nurse-to-patient staffing ratios.
Conduct regular multidisciplinary simulation exercises.
Establish digital quality-monitoring and medication-safety reporting systems.
Promote continuous professional education for all healthcare team members.

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