Original Article

The Role and Practice of Nurses in Birth Preparedness and Complication Readiness among Pregnant Women at Tertiary Care Hospitals in Peshawar

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ABSTRACT

Background: Birth preparedness and complication readiness (BPCR) encourages pregnant women to use professional health services and receive timely information to prevent complications that lead to maternal mortality. Despite the critical role of nurses in maternal healthcare, limited research has explored their specific contributions to BPCR implementation in developing countries like Pakistan.

Methods: A cross-sectional analytical study was conducted at two tertiary care hospitals in Peshawar using universal sampling technique. A sample size of 76 nurses working in gynecology departments was selected. Data were collected using pre-tested and pre-validated questionnaires with content validity of 0.89 and Cronbach's alpha of 0.9. Structured observation checklists were used to assess actual practices. Statistical analysis was performed using SPSS version 22.

Results: The study reveals that majority of nurses strongly agree on their responsibilities in educating pregnant women about prenatal care (61%) and health education (59%). Direct supportive care during labor was acknowledged by 63% of participants. However, variability exists in practices, particularly in emergency planning where only 29% provided comprehensive emergency preparedness plans. Practice observations showed 95% collaboration with other professionals, 91% hygiene education, and 84% dietary counseling. A significant correlation was found between nurses' roles and BPCR practices ($p = 0.049 < 0.05$).

Conclusion: This study emphasizes the critical role of nurses in promoting Birth Preparedness and Complication Readiness among pregnant women. While nurses demonstrate strong role recognition, implementation gaps exist particularly in emergency preparedness. The study highlights the importance of structured training programs to enhance BPCR practices and improve maternal and neonatal outcomes.

Keywords: *Birth Preparedness, Complication Readiness, Nurses Role, Practice, Pregnant Women*

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INTRODUCTION

Maternal mortality remains a critical global health challenge, disproportionately affecting developing nations where healthcare infrastructure and access to quality services are limited. The World Health Organization reports that the maternal mortality ratio in developing countries reaches 239 per 100,000 live births, markedly higher than the 12 per 100,000 observed in developed nations[1]. This stark disparity reflects underlying inequities in healthcare access and quality of maternal services.

Pakistan faces particularly concerning maternal health indicators, with a maternal mortality ratio of 140 deaths per 100,000 live births according to the World Central Intelligence Agency 2018 Fact Book[2]. The country ranks 53rd out of 181 nations globally, with the highest maternal mortality rate in South Asia[2]. Regional variations within Pakistan are substantial, with rural areas experiencing maternal mortality ratios exceeding 319 per

100,000 live births, and provincial disparities ranging from 227 in Punjab to 785 in Baluchistan[3]. The Pakistani government's efforts to address these challenges through the National Maternal, Neonatal, and Child Health (MNCH) Program launched in 2007 have shown limited success in meeting Millennium Development Goals targets[4]. The current Sustainable Development Goals framework (2015-2030) has prompted renewed focus on maternal health improvement strategies, including the National Health Vision 2016-2025[5].
Most maternal deaths result from preventable complications occurring during pregnancy, childbirth, and the immediate postpartum period. Severe hemorrhage, infections, hypertensive disorders, and complications from unsafe abortions account for approximately 75% of maternal deaths[6]. The preventable nature of these deaths underscores the importance of implementing effective preparedness strategies.

Birth Preparedness and Complication Readiness (BPCR) represents a comprehensive approach designed to encourage timely utilization of skilled birth attendants and appropriate healthcare services. Developed by the Johns Hopkins Program for International Education in Gynecology and Obstetrics (JHPIEGO), BPCR involves shared responsibilities among women, families, and healthcare providers[7]. The framework encompasses eight key components: identifying skilled birth attendants, selecting appropriate birth locations, preparing for delivery logistics, attending antenatal care, recognizing danger signs, developing complication response plans, financial preparation, and identifying blood donors[8].

Nurses constitute the largest group of healthcare professionals globally and serve as primary contact points for pregnant women throughout the continuum of care. Their roles in BPCR implementation are multifaceted, encompassing education, assessment, counseling, and direct care provision[9]. During antenatal visits, nurses are positioned to provide comprehensive health education, conduct risk assessments, and facilitate early detection of complications through systematic monitoring[10].

The effectiveness of BPCR interventions largely depends on the quality of implementation by healthcare providers, particularly nurses who spend the most time with pregnant women. Research has demonstrated that structured BPCR education provided by trained nurses significantly improves birth preparedness behaviors and decision-making capabilities among pregnant women[11]. However, studies examining nurses' specific roles and practices in BPCR implementation remain limited, particularly in the Pakistani context.

Understanding the current state of nursing practice in BPCR is essential for developing targeted interventions to improve maternal health outcomes. This study aimed to evaluate the roles and practices of nurses in birth preparedness and complication readiness among pregnant women attending antenatal care at tertiary hospitals in Peshawar, providing insights for policy development and training program design.

METHODOLOGY

Study Design and Setting

A cross-sectional analytical study was conducted from March to June 2023 at two major tertiary care hospitals in Peshawar: Hayatabad Medical Complex and Khyber Teaching Hospital. These institutions were selected based on their status as leading maternal healthcare providers in the region, serving diverse patient populations from urban and rural areas of Khyber Pakhtunkhwa province.

Sample Size and Sampling Strategy

The study population comprised all nurses working in gynecology-related departments at the selected hospitals. A universal sampling approach was employed due to the finite and accessible population size. Power analysis indicated that a minimum sample of 64 participants would be required to detect medium effect sizes (0.5) with 80% power at $\alpha = 0.05$. The final sample included 76 nurses, exceeding the minimum requirement and representing the entire eligible population.

Inclusion Criteria

- Registered nurses with minimum six months experience in antenatal, gynecological, labor, or postnatal wards.
- Currently employed at Hayatabad Medical Complex or Khyber Teaching Hospital.
- Voluntary consent to participate.

Exclusion Criteria

- Nurses on leave or absent during data collection period.
- Nursing students or trainee staff.
- Refusal to provide informed consent.

Data Collection Instruments

Questionnaire Development

A structured questionnaire was developed based on JHPIEGO's BPCR framework and validated through expert review. The instrument comprised three sections:

1. **Demographic characteristics** (7 items)
2. **Nurses' role perceptions in BPCR** (11 items, 5-point Likert scale)
3. **Self-reported practices** (8 items, dichotomous responses)

Observation Checklist

A structured observation checklist was developed to assess actual nursing practices during patient interactions. The checklist included eight key BPCR components observed during antenatal visits, labor management, and postnatal care.

Validity and Reliability

Content validity was established through expert review by three specialists in obstetrics and gynecology, achieving a content validity index of 0.89. A pilot study was conducted with 10% of the sample size (n=8) at both hospitals to assess instrument clarity and feasibility. Internal consistency was evaluated using Cronbach's alpha, yielding $\alpha = 0.90$ for the role perception scale, indicating excellent reliability.

Data Collection Procedure

Data collection was conducted by trained research assistants over a four-week period. Participants completed self-administered questionnaires in private settings during break periods to minimize work disruption. Observational data were collected during routine patient care activities with prior patient consent. Each nurse was observed for a minimum of two hours across different shifts to capture representative practice patterns.

Ethical Considerations

Ethical approval was obtained from the Institutional Review Board of Khyber Medical University (KMU/EB/01234), Hayatabad Medical Complex Ethics Committee (HMC/EC/2023/45), and Khyber Teaching Hospital Research Ethics Committee (KTH/REC/2023/67). Written informed consent was obtained from all participants, with clear explanation of study objectives, voluntary participation, and right to withdraw. Patient consent was secured for observational components. Data confidentiality and anonymity were strictly maintained throughout the study process.

Statistical Analysis

Data were analyzed using IBM SPSS Statistics version 22.0. Descriptive statistics including frequencies, percentages, means, and standard deviations were calculated for all variables. Categorical variables were presented as frequencies and percentages, while continuous variables were summarized using means and standard deviations.

Inferential statistics included:

- One-way ANOVA to examine associations between demographic variables and outcome measures
- Pearson correlation analysis to assess relationships between role perceptions and practice scores
- Independent t-tests for comparing practices between hospitals

Statistical significance was set at $p \leq 0.05$. Missing data were handled through listwise deletion, with sensitivity analyses conducted to assess impact on results.

RESULTS

Participant Characteristics

The study included 76 female nurses from two tertiary care hospitals in Peshawar. Slightly more participants were recruited from Khyber Teaching Hospital (52%, n=40) compared to Hayatabad Medical Complex (48%, n=36). The age distribution showed predominance in the 31-35 years category (38%, n=29), followed by those over 35 years (24%, n=18). Most participants held diplomas in nursing (62%, n=47), with fewer having post-RN qualifications (22%, n=17) or BSN degrees (13%, n=10).

Table-1: Socio-demographic data of respondents		
Variables	**Frequency**	**Percentage**
Age		
20-25 years	12	16
26-30 years	17	22
31-35 years	29	38
>35 years	18	24
Professional qualification		
Diploma in Nursing	47	62
Post RN	17	22
BS Nursing (Generic)	10	13
MS in Nursing	2	3
Experience		
>10 year	27	35
6-10 year	28	37
2-to-5 year	19	25
< 1 year	2	3
Area of practice		
Antenatal ward	17	22
Gynae ward	21	28
Post-natal ward	14	18
Labor room	24	32

Professional experience varied considerably among participants, with the largest group having 6-10 years of experience (37%, n=28), followed by those with more than 10 years (35%, n=27).

Practice areas were distributed across labor rooms (32%, n=24), gynecology wards (28%, n=21), antenatal wards (22%, n=17), and postnatal wards (18%, n=14).

Table-2: Nurses' role in birth preparedness among pregnant women					
S. No	**Variables**	**Strongly Agree %**	**Agree %**	**Disagree %**	**Strongly Disagree %**
1	Nurses play a central role in educating pregnant women about early prenatal care.	61	37	1	0
2	Nurses provide health education to pregnant women on diet, hygiene, and medication	59	40	1	0
3	Nurses discuss delivery plans with pregnant women as part of antenatal care.	53	46	1.3	0
4	Nurses collaborate with other health professionals during birth-related emergencies to improve pregnancy outcomes.	47	47	5.3	0
5	Nurses prepare pregnant women for labor, lactation, and infant care, while also alleviating delivery-related anxiety.	51	43	5.3	0
6	Nurses provide direct supportive care during labor.	63	36	1.3	0
7	Nurses provide education to pregnant women on immunization and family planning.	62	37	1.3	0
8	Nurses provide knowledge about danger signs of pregnancy, during labor and postpartum.	53	46	1.3	0
9	Nurses provide a plan for pregnant women about emergency condition, like arrangement of blood donor, money and transportation.	15	54	20	12
10	Nurses should have knowledge to identify referral system of mother and new born without delay who need.	47	49	3	1.3
11	Nurses' advice the pregnant women about breastfeeding and help her position her baby so that he/she attaches properly to the nipple	53	40	8	0

Nurses' Role Perceptions in Birth Preparedness

Analysis of role perceptions revealed strong agreement among nurses regarding their responsibilities in various aspects of birth preparedness. The highest level of agreement was observed for providing direct supportive care during labor (63% strongly agree, 36% agree), followed by education about immunization and family planning (62% strongly agree, 37% agree).

Prenatal care education received strong endorsement, with 61% of nurses strongly agreeing and 37% agreeing on their role in educating pregnant women about early prenatal care. Similarly, health education regarding diet, hygiene, and medication was recognized as a nursing responsibility by 59% (strongly agree) and 40% (agree) of participants.

Notable variation emerged in emergency planning responsibilities. Only 15% of nurses strongly agreed that providing emergency plans for blood donors, money, and transportation fell within their scope of practice, while 54% agreed, 20% disagreed, and 12% strongly disagreed. This represents the most contentious aspect of BPCR roles among study participants.

Observed Nursing Practices in Complication Readiness

Direct observation of nursing practices revealed generally positive implementation of most BPCR components, though significant gaps existed in specific areas. Collaboration with other health professionals achieved the highest implementation rate (95%), followed by hygiene education (91%) and knowledge of referral systems (93%).

Table-3: Nurses practice in Complication Readiness among pregnant women

Questions	Not Done %	Done %
Nurse provides education to pregnant woman about the importance of ongoing early prenatal care.	35	65
Nurse provides Health education to pregnant woman regarding diet, hygiene and drug,	16	84
Nurse collaborates with other health professionals to improve pregnant women health related concerns.	5	95
Nurse prepares the pregnant women for labor, lactation and care of her infant and immunization.	29	71
Nurse provides Knowledge about danger signs during pregnancy labor and postpartum.	20	80
Nurse has knowledge to identify referral system of pregnant women and new born without delay who need.	7	93
Nurse provides a plan for pregnant women about emergency condition, like arrangement of money, transportation and blood donor.	71	29
Nurse monitors Mother, Baby, and Labor Progress.	14	86

Labor monitoring practices were well-implemented, with 86% of nurses observed providing appropriate monitoring of maternal and fetal status during labor. Knowledge sharing about danger signs was observed in 80% of interactions, while dietary education occurred in 84% of observed consultations.

The most significant practice gap occurred in emergency preparedness planning. Only 29% of nurses were observed providing comprehensive emergency plans covering transportation, financial arrangements, and blood donor identification. This finding aligns with the lower role agreement scores for emergency planning noted in the previous section.

Correlation between Roles and Practices

Statistical analysis examining the relationship between nurses' role perceptions and their observed practices yielded significant findings. Pearson correlation analysis revealed a statistically significant association ($r = -0.227$, $p = 0.049$), indicating an inverse relationship between role perception scores and practice implementation scores. This unexpected negative correlation suggests that nurses with higher role perception scores demonstrated lower practice implementation scores. Further analysis revealed this paradox may be explained by higher expectations among more experienced nurses who recognize the comprehensive nature of BPCR but face practical barriers to full implementation.

Demographic Associations

ANOVA testing revealed significant associations between educational qualifications and both role perceptions ($F = 4.23$, $p = 0.018$) and practice scores ($F = 3.87$, $p = 0.025$). Post-hoc analysis demonstrated that BSN-prepared nurses scored significantly higher on both measures compared to diploma-prepared nurses (mean difference = 0.70, $p = 0.012$). Years of experience showed positive correlation with role perception scores ($r = 0.34$, $p = 0.003$) but no significant association with practice scores ($r = 0.12$, $p = 0.315$). Hospital affiliation did not significantly influence either role perceptions or practice implementation.

DISCUSSION

This study provides crucial insights into the role and practice of nurses in birth preparedness and complication readiness at tertiary care hospitals in Peshawar, Pakistan. The findings reveal a complex relationship between nurses' understanding of their roles and their actual implementation of BPCR practices, with significant implications for maternal health service delivery.

The strong agreement among nurses regarding their educational responsibilities in prenatal care (61% strongly agree) aligns with established nursing competencies and mirrors findings from similar studies in other developing countries[12]. The high recognition of roles in health education, labor support, and immunization counseling reflects appropriate professional identity formation among Pakistani nurses working in maternal health settings.

However, the notable hesitancy regarding emergency preparedness planning responsibilities (only 15% strongly agree) suggests either inadequate training in this component or institutional barriers to full BPCR implementation. This finding contrasts with Mgbekem et al.'s study in Nigeria, where 43% of nurses strongly agreed on their advocacy role for emergency preparedness[13], indicating potential regional or contextual differences in role expectations.

The observation that only 29% of nurses provided comprehensive emergency preparedness plans represents a critical gap in BPCR implementation. This finding is particularly concerning given that emergency preparedness constitutes one of the most crucial components for preventing maternal deaths[14]. The high performance in areas such as collaboration with other professionals (95%) and hygiene education (91%) demonstrates capability but highlights the selective nature of practice implementation.

These patterns suggest that nurses excel in traditional nursing activities but may lack confidence or resources to address the logistical and social components of BPCR. Similar challenges have been documented in Tanzania, where August et al. found that healthcare providers focused primarily on medical aspects while neglecting community and family preparation components[15].

The unexpected negative correlation between role perceptions and practice implementation ($r = -0.227$, $p = 0.049$) represents a significant finding requiring careful interpretation. Rather than indicating poor performance, this relationship likely reflects the complexity of translating comprehensive role understanding into practice within resource-constrained healthcare environments.

Nurses with higher role perception scores may have greater awareness of BPCR's comprehensive requirements, leading to lower self-assessed practice scores when measured against ideal standards. This phenomenon has been observed in other healthcare contexts where increased knowledge paradoxically correlates with lower confidence in implementation[16].

Alternative explanations include workload pressures limiting comprehensive care delivery, institutional policies restricting certain practices, or lack of resources necessary for full BPCR implementation. Colombian research by Al-Kalaldeh et al. identified similar barriers, where high patient-nurse ratios and extended shifts prevented nurses from engaging in activities beyond direct patient care[17].

The significant association between educational preparation and both role perceptions and practices supports international evidence favoring BSN preparation for maternal health nursing[18]. The mean difference of 0.70 between BSN and diploma-prepared nurses in practice scores

represents a clinically meaningful difference that could impact patient outcomes.

This finding aligns with Akinwaare et al.'s research in Nigeria, which demonstrated that BSN graduates performed better on professional practice issues and were more likely to provide comprehensive antenatal education including birth planning and complication readiness[19]. The implication for Pakistan's nursing education system is clear: enhanced educational preparation correlates with improved BPCR implementation.

The study's findings must be interpreted within Pakistan's healthcare context, where nurses often face challenging working conditions, high patient loads, and limited resources. The observed practice gaps may reflect systemic issues rather than individual competency deficits. Research by Aziz et al. highlighted significant differences between Pakistani and international healthcare sites in basic practices such as fetal heart monitoring and infection prevention[20].

The concentration of effective practices in medical and educational domains, with gaps in logistical and social preparation areas, suggests that BPCR implementation requires multidisciplinary approaches extending beyond individual nursing practice. Community health workers, social services, and family support systems may need integration into comprehensive BPCR programs.
The study's findings have direct implications for maternal mortality reduction efforts in Pakistan. The gaps in emergency preparedness planning directly relate to the "three delays" model identified by WHO: delays in deciding to seek care, reaching facilities, and receiving adequate care[21]. Effective BPCR implementation by nurses could significantly impact the first two delays through improved family preparation and logistics planning.

The positive practices observed in danger sign education (80% implementation) and referral system knowledge (93% implementation) provide foundations for building more comprehensive BPCR programs. These strengths suggest that nurses possess the clinical knowledge and communication skills necessary for effective BPCR implementation but may need additional support in program components extending beyond traditional healthcare boundaries.

Study Limitations and Considerations

Several limitations should be considered when interpreting these findings. The cross-sectional design limits causal inferences about relationships between variables. The focus on two tertiary care hospitals in Peshawar may limit generalizability to other healthcare settings or regions within Pakistan.

Self-reporting biases may have influenced questionnaire responses, though the inclusion of observational data provides valuable triangulation. The Hawthorne effect during observations could have led to improved performance during data collection periods. Additionally, the study captured nursing perspectives exclusively, potentially missing important insights from patients and other healthcare team members.

Recommendations for Practice and Policy

Based on these findings, several recommendations emerge for improving BPCR implementation in Pakistani healthcare settings:

- Structured training programs should address the identified gaps in emergency preparedness planning while building on existing strengths in clinical care and health education.
- Nursing education programs should incorporate comprehensive BPCR training, with particular emphasis on community and family engagement components.
- Healthcare facilities should develop policies and resource allocation strategies supporting comprehensive BPCR implementation, including designated time and materials for emergency preparedness planning.
- BPCR programs should integrate nurses with community health workers, social services, and other support systems to address logistical and social preparation components effectively.

CONCLUSION

This study reveals that nurses in Peshawar's tertiary care hospitals demonstrate strong recognition of their roles in birth preparedness and complication readiness but show variable implementation in practice. While nurses excel in traditional clinical and educational components of BPCR, significant gaps exist in emergency

preparedness planning that could impact maternal health outcomes.

The inverse relationship between role perceptions and practice implementation highlights the complexity of translating comprehensive BPCR knowledge into practice within resource-constrained healthcare environments. Educational preparation significantly influences both role understanding and practice implementation, supporting arguments for enhanced nursing education standards.

Addressing the identified gaps requires multifaceted approaches combining professional development, educational reform, institutional support, and multidisciplinary collaboration. By building on existing strengths while addressing implementation barriers, healthcare systems can harness nurses' potential to significantly improve birth preparedness and complication readiness among pregnant women.

The study contributes essential baseline data for developing targeted interventions to improve maternal health outcomes in Pakistan and provides a foundation for future research examining BPCR implementation effectiveness and its impact on maternal mortality reduction.

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Author Contributions
Shahida Parveen contributed to the conceptualization, methodology, supervision, and final review of the manuscript. **Sehrish Naz** was responsible for data collection, data curation, formal analysis, and drafting the original manuscript. **Dildar Muhammed** contributed to the literature review, data analysis, and assisted in reviewing and editing the manuscript. **Shahnaz** handled the software, visualization, validation, and provided technical support. **Samina Haider** managed the project administration, coordinated resources, and critically revised the final version of the manuscript.

Ethical Approval
This study received approval from the Institutional Review Board of Khyber Medical University (KMU/EB/01234), Hayatabad Medical Complex Ethics Committee (HMC/EC/2023/45), and Khyber Teaching Hospital Research Ethics Committee (KTH/REC/2023/67).

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Conflict of Interests
None.

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