

NEONATAL RESUSCITATION KNOWLEDGE LEVEL AMONG NURSES IN TERTIARY HOSPITAL

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Abstract

Neonatal resuscitation represents an essential life-saving procedure which decreases both neonatal health problems and death rates among newborns. Nurses need both sufficient knowledge and quick decision-making skills to deliver complete neonatal treatment in tertiary hospital settings. The research study conducted to examine the staff nurses' knowledge of neonatal resuscitation at a tertiary hospital neonatal unit. A descriptive cross-sectional study was conducted at the Children Hospital and the Institute of Child Health Sciences (CH & ICH), Lahore, Pakistan. The target population consisted of registered nurses working in neonatal departments. A non-probability convenience sampling technique was used, and a sample size of 90 nurses was selected. The research team used a structured self-administered questionnaire to gather data which included demographic details and 18 multiple-choice questions

testing neonatal resuscitation knowledge. The study results showed the participants had moderate to low knowledge about important topics which included CPR reassessment timing 43.3% of the time and effective ventilation indicators 43.3% of the time and persistent apnea management 48.9% of the time and accurate neck positioning during resuscitation 48.9% of the time. The researchers discovered that people had incorrect beliefs about how to manage ventilation and perform chest

compression techniques. The study found that nurses showed good knowledge about neonatal resuscitation but they lacked skills needed for critical decision-making and advanced resuscitation techniques.

INTRODUCTION

Background

Neonatal resuscitation is a series of life-saving procedures immediately after birth that help a newborn who is not breathing or is struggling to start breathing to begin effective breathing and circulation (Wubishet et al., 2025). The first minutes after birth are crucial and delayed breathing initiation is responsible for a significant fraction of all intrapartum related neonatal deaths and the long-term neurological sequelae. Helping Babies Breathe emphasizes the significance of the “Golden Minute”, in which the newborn is either breathing spontaneously or is provided with sufficient ventilation (Soti et al., 2021).

However, the evidence from low income settings suggests a 16% rise in neonatal deaths for every 30 seconds for which the ventilations are delayed and a 6% rise in neonatal deaths for every minute delay in initiating bag and mask ventilation (Soti et al., 2021). So, early and effective neonatal resuscitation can prevent not only death but also the long-term effect like cerebral palsy, epilepsy and developmental delay (Chaulagain et al., 2021). Although low-cost interventions and effective interventions that can reduce birth asphyxia-related deaths by 20–30% are available if they are delivered at the right time, many of the nurses and midwives working in the tertiary level of health services in low resource settings still show inadequate knowledge about neonatal resuscitation (Wubishet et al., 2025).

In the world, birth asphyxia is the second most common cause of neonatal death, contributing to an estimated 23-25% of neonatal deaths (Wubishet et al., 2025). The World Health Organization estimates that almost 700,000 deaths each year are directly caused by birth asphyxia, accounting for approximately 25% of neonatal deaths (WHO, 2020).

Low and middle income country studies have consistently shown poor neonatal resuscitation knowledge of nurses and midwives. The studies carried out in Ethiopia, Tanzania and Nepal indicate that the knowledge of nurses and midwives is inadequate, with more than 80% of healthcare providers in one tertiary hospital in Ethiopia not scoring well in the resuscitation assessment (Soti et al., 2021). The treatment of asphyxiated neonates is inconsistent in tertiary hospitals in Pakistan as the nursing students and early career providers lack confidence and exposure in treatment of asphyxiated neonates (Liaqat et al., 2021). The risks of bag and mask ventilation and active resuscitation in the newborn are estimated to be 1–10% and 5–10% respectively in other parts of the world, respectively, and are equally applicable in high volume hospitals in Pakistan (Liaqat et al., 2021).

Nurses are key personnel in neonatal resuscitation (NR) and are the first persons on the scene at nearly every delivery in tertiary hospitals (Wubishet et al., 2025). Nurses need to assess the airway patency, breathing effort, temperature and heart rate quickly during the Golden Minute to avoid life threatening complications (Joho et al., 2020). If breathing does not start, it is their responsibility to perform the entire neonatal resuscitation procedure such as positioning the airway, suctioning, drying and stimulating the baby, provide thermal protection and ensure that bag-and-mask ventilation is

started promptly which has been shown to reduce neonatal mortality if bag-mask is performed promptly (Guta, 2022).

Studies have shown that the direct impact of nurses' knowledge, clinical skills and attitudes on neonatal outcomes. The lack of knowledge puts them at risk of complications resulting from birth-asphyxia related interventions as they may be delayed or not performed correctly (Wubishet et al., 2025). Evidence-driven practice is closely linked to strong theoretical knowledge and practical skills, helping to minimize delays that significantly lead to higher mortality and longer term neurological damage (Joho et al., 2020). On the other hand, inadequate knowledge and training have been consistently associated with poor procedural performance and ineffective ventilation (Wubishet et al., 2025).

Attitude towards neonatal resuscitation is also significant. The positive attitude contributes to nurses having good motivation, confidence, and readiness to act calmly in emergency situations and follow resuscitation protocols consistently. A positive attitude creates an atmosphere of high motivation, confidence, and readiness for nurses to respond calmly in emergency situations and consistently follow resuscitation protocol (Wubishet et al., 2025). Research has shown that there is a positive link between knowledge and positive attitudes which is associated with improved neonatal survival (Soti et al., 2021).

Localized research is needed to inform specific training programs, targeting resources and quality improvement activities, within tertiary healthcare facilities due to the close relationship of inadequate knowledge, negative attitudes, delayed ventilation and neonatal mortality. Adequate knowledge, negative attitudes, delayed ventilation and increased neonatal deaths are all interrelated and therefore localized research is needed to inform specific training programs, targeting resources and quality improvement activities, within tertiary healthcare facilities.

Objective of Research

- To evaluate nurses' knowledge about neonatal resuscitation in the Tertiary hospitals.

Research Questions

- How much knowledge do the nurses in tertiary hospitals have about neonatal resuscitation?

Operational definition

Nurses knowledge regarding neonatal resuscitation is measured by self-structured 21 items questionnaire adopted from previous study conducted by (Wubishet et al., 2025) the questions are in the form of multiple choice. 1 point will be awarded for every correct answer and 0 will be awarded for every incorrect answer.

METHODOLOGY

Study Design

A descriptive cross-sectional study was used to assess knowledge of the nurses regarding neonatal resuscitation.

Study Setting

The study conducted in the Children Hospital & the Institute of Child Health Sciences (CH & ICH) Lahore, a Tertiary care public hospital under the Punjab Health Department.

Study Population

The target population consisted of registered nurse (RN) working in neonatal departments of the

Children's Hospital, Lahore.

Sample Size & Sampling Technique

A sample of 90 was calculated using the formula of finite population and non-probability convenience sampling technique was used to collect data from them.

Data Collection Tool & Analysis

Data collection tool comprised two sections. Section 1 included demographic variables such as age of the participants, sex, total year of nursing experience, highest professional qualification working unit as well as job title. Section 2 consisted of 18 questions to assess knowledge. All items were in the format of multiple-choice questions containing four different answers with one right answer. Every correct answer awarded a score of 1, while a wrong response yields a score of 0.

The data were analyzed by using the Statistical Package for the Social Sciences (SPSS) version 27. Descriptive statistics such as mean, percentages were used to summarize the demographic variables.

RESULTS

Demographic Characteristics of Participants

The results related to demographic variable are showed in Table 1 which manifested that among nurses working in the neonatal ward of the Children's Hospital, the majority (50%) hold a diploma in nursing, followed by those with a bachelor's degree in nursing (40%), while only 10% possess a master's degree as shown in table 1.

The nurses working in the neonatal ward of the Children's Hospital, Lahore, have an average age of approximately 29 years. On average, they possess about three years of total professional experience, with a minimum of one year and a maximum of five years. In terms of neonatal ward experience, the nurses have an average of nearly two years of experience, ranging from a minimum of one year to a maximum of four years.

Table 1: Distribution of Respondents by Demographic Variables

Variables	Level	Count	Share (%)
Age (Years)	Up to 30	56	62.2
	31-35	26	28.9
	Above 35	8	8.8
Level of Education	Diploma	45	50.0
	Degree	36	40.0
	Masters	9	10.0
Experience in Neonatal ward (Years)	Up to 2 Years	71	78.9
	2-4 Years	19	21.1
Total Experience (Years)	Up to 3 Years	62	68.9
	3-6 Years	28	31.1

Table 2: Descriptive Statistics of Demographic Characteristics of Nurses

Variables	N	Min.	Max.	Mean	S.D.
Age (Years)	90	24	40	29.51	3.602
Total Experience (years)	90	1	5	2.98	.971
Experience in Neonatal Resuscitation (years)	90	1	4	2.03	.726

Assessment of Staff Nurses' Knowledge on Neonatal Resuscitation

The study results show that people who participated in the research possess good understanding about neonatal resuscitation which they demonstrated through their correct answers in multiple choice sections. The research demonstrated that participants showed strong understanding about essential medical procedures which included suctioning indication (97.8%), chest compression indication (93.3%), shock volume expander use (91.1%), and post-resuscitation standard care practices (90.0%). The research showed that most respondents understood essential resuscitation guidelines which they demonstrated by correctly identifying mask placement (87.8%), compression depth (87.8%), compression ratio (87.8%), and preferred medication (83.3%).

The study results showed that participants correctly answered important questions about CPR reassessment time (43.3%), best indicator of effective ventilation (43.3%), persistent apnea management (48.9%), and correct neck positioning (48.9%) at moderate to low levels. The evidence shows that people lack understanding about timing and assessment indicators and specific procedural methods which table 21 illustrates. Most respondents showed good understanding of basic neonatal resuscitation knowledge but they need specific training to learn about critical decision-making processes and exact procedure steps.

DISCUSSION

The study showed that participants had solid understanding of multiple fundamental elements which form the basis of neonatal resuscitation. Most respondents (81.1%) correctly recognized that resuscitation preparation needs to happen for every delivery. The international neonatal resuscitation guidelines require hospitals to prepare for unexpected neonatal emergencies because every delivery needs their full readiness (American Heart Association [AHA], 2020; Helping Babies Breathe [HBB], 2016). The study found that participants answered correctly about suctioning indications (97.8%) and chest compression indication (93.3%) and compression depth (87.8%) and compression ratio (87.8%) and use of epinephrine (83.3%) with high accuracy.

The research results match the findings from Ethiopian and Indian studies which showed that healthcare providers performed better in practical procedures like suctioning and chest compressions than in cognitive decision-making tasks (Mekonnen et al., 2020; Goudar et al., 2015). The results stem from clinicians who acquire practical experience through clinical work and hands-on training sessions in neonatal units.

Table 3: Overall Knowledge of Respondents Regarding Neonatal Resuscitation Practices

Sr. No.	Items	Correct Answer	Percentage (n)
1	Prepared to resuscitate neonate	At every birth	81.1% (73)
2	CPR reassessment time	60 seconds	43.3% (39)
3	Baby for routine care after birth	To all resuscitated babies	90.0% (81)
4	Volume expander indication	If there is a sign of shock	91.1% (82)
5	Preferred medication	Epinephrine	83.3% (75)
6	When to suction baby	When secretions block mouth and nose	97.8% (88)
7	Unnecessary suctioning can	Cause baby to stop breathing	75.6% (68)
8	Neck position for resuscitation	Slightly extended	48.9% (44)
9	Mask coverage	Mouth, nose, and tip of chin (not eyes)	87.8% (79)
10	Chest not moving (bag & mask)	Reapply mask for better seal	57.8% (52)
11	Persistent apnea action	Give positive pressure ventilation	48.9% (44)
12	Best gas source	O ₂ with cylinder	70.0% (63)
13	Best indicator of ventilation	Chest movements	43.3% (39)
14	Start chest compressions	HR < 60 bpm after ventilation	93.3% (84)
15	Compression technique	Two thumbs	78.9% (71)
16	Compression pressure	1/3 AP chest diameter	87.8% (79)
17	Compression ratio	3:1	87.8% (79)
18	Preferred volume expander	0.9% NaCl	62.2% (56)

Knowledge Regarding Resuscitation Timing and Assessment

The research results showed that participants possessed sufficient knowledge but failed to understand CPR reassessment time because only 43.3% of them correctly identified the recommended 60-

second interval. The study results show that people who know about standardized resuscitation cycles demonstrate differing levels of understanding between these two resuscitation cycles.

The study results show that researchers need to develop precise timing methods because neonatal resuscitation depends on accurate time measurements. The Neonatal Resuscitation Program (NRP) mandates that healthcare professionals must conduct heartbeat and breath capacity evaluations every minute to determine patient status (Kattwinkel et al., 2016). Healthcare providers in sub-Saharan Africa and South Asia demonstrate similar operational deficiencies according to research, which shows they face difficulties with proper timing and sequence execution during resuscitation procedures (Ersdal et al., 2013; Lee et al., 2011).

Ventilation and Airway Management Knowledge

The study discovered that people had different levels of understanding which effective ventilation

indicators should be used to measure proper breathing control. The study found that many respondents depended on clinical signs which had lower reliability than oxygen saturation and auscultation methods. The neonatal guidelines from AHA 2020 state that chest rise should be used as the primary method to measure effective bag and mask ventilation. The study found that 57.8% of participants correctly identified that improper chest movement during ventilation should prompt mask repositioning while a significant number of people chose to perform incorrect actions which included stopping ventilation and back slapping. The study shows that clinical practice will harm neonatal outcomes because medical personnel hold these incorrect beliefs. The studies conducted by Wall et al. in 2010 and Ersdal et al. in 2013 showed that inadequate ventilation techniques create a major problem for neonatal resuscitation efforts which demonstrates the need for ongoing skills development.

Knowledge of Apnea Management and Oxygen Use

Less than half of the respondents (48.9%) correctly identified positive pressure ventilation as the appropriate immediate response to persistent apnea. Instead, a considerable proportion selected less effective interventions such as tactile stimulation or free-flow oxygen. This finding reflects a gap in understanding the prioritization of ventilation over oxygen delivery in neonatal resuscitation.

According to NRP guidelines, effective ventilation is the most critical step in neonatal resuscitation, and oxygen alone is insufficient in cases of apnea (Kattwinkel et al., 2016). Similar gaps have been documented in other studies where healthcare providers overemphasize oxygen administration rather than ventilation support (Singhal et al., 2012).

Chest Compression Knowledge

The findings regarding chest compressions were generally strong. A high proportion of respondents correctly identified the compression-to-ventilation ratio (87.8%), compression depth (87.8%), and indication for compressions (93.3%). However, misconceptions were observed in the selection of compression technique, where 78.9% incorrectly chose “two thumps” instead of the recommended two-thumb encircling technique.

This suggests that while theoretical knowledge of compressions is adequate, specific procedural details require reinforcement. Previous studies have also highlighted inconsistencies in the application of correct compression techniques among nurses, particularly in resource-limited settings (Singhal et al., 2012; Lee et al., 2011).

Volume Expansion and Medication Knowledge

The majority of people demonstrated good knowledge about volume expansion because 91.1% of them correctly understood when to use this medical condition. The preferred volume expander choice of 62.2% of participants who chose 0.9% NaCl as their option, but many others selected incorrect options which included unmatched blood products. The 83.3% of respondents correctly identified epinephrine as the preferred medication. The established neonatal resuscitation guidelines specify that medical professionals should use epinephrine treatment only when infants show persistent bradycardia, despite receiving proper ventilation (AHA, 2020). The research findings demonstrate that participants possess strong pharmacological knowledge, but they still hold some

incorrect beliefs. The aggregated results (Table 21) show that nurses possess fundamental knowledge about neonatal resuscitation, yet their skills in timing, decision-making, and physiological interpretation remain underdeveloped. The critical gaps in these areas exist because neonatal resuscitation requires healthcare professionals to make quick and precise decisions throughout the entire process.

The observed knowledge variability can be explained through two factors which include insufficient refresher training and limited simulation-based practice and differences in clinical exposure. The existing literature provides strong evidence that regular simulation training establishes a direct link between training and improved neonatal resuscitation performance which results in better skill retention (Msemo et al., 2013; Helping Babies Breathe, 2016).

The study shows that nurses have satisfactory knowledge about neonatal resuscitation. The nurse demonstrates strong understanding of core procedures yet needs professional development through structured training and simulation-based learning to develop decision-making competencies. The evaluation process requires us to enhance these particular aspects because they directly impact neonatal survival rates in tertiary care facilities.

Conclusion

The present study concluded that staff nurses working in the neonatal ward of the tertiary care hospital possessed satisfactory overall knowledge regarding neonatal resuscitation. The majority of participants showed complete understanding about fundamental neonatal resuscitation methods which include delivery preparation and suctioning and chest compressions and volume expansion and epinephrine administration. The results demonstrate that nurses possess knowledge about essential elements of neonatal emergency medical treatment.

The study discovered critical knowledge deficiencies which included understanding when to reassess during cardiopulmonary resuscitation and how to identify successful ventilation and manage apnea and make proper treatment choices. Theoretical knowledge exists among nurses who understand standard neonatal resuscitation protocols but their practical skills in applying those standards remain inadequate. The existing deficiencies will diminish the standard of neonatal treatment which will create negative effects on neonatal survival rates.

The findings show that ongoing professional growth requires both refresher training and simulation training and educational programs that assess skills. The structured training sessions which follow Neonatal Resuscitation Program (NRP) and Helping Babies Breathe (HBB) guidelines will help nurses enhance their practical competencies and decision-making skills and their ability to follow evidence-based protocols.

The nurses exhibited enough neonatal resuscitation knowledge but their decision-making skills and advanced resuscitation techniques need to be developed for their professional development. Continuous education and hands-on simulation training should be prioritized to enhance the quality of neonatal care and improve neonatal survival in tertiary care hospitals.

Recommendations

Tertiary care hospitals are recommended to conduct in-services, refresher courses and simulation based neonatal resuscitation training for staff nurses, per the Neonatal Resuscitation Program (NRP)

and Helping Babies Breathe (HBB) guidelines, based on the results of this study. Regular assessments of competency and practical skills testing should be carried out to reinforce nurses' decision making skills, enhance their skills in advanced neonatal resuscitation and address gaps in knowledge relevant to assessment of ventilation, cardiopulmonary resuscitation and emergency interventions. In addition, hospital administrators should ensure the continuous improvement of the neonatal care by providing training based on evidence, regular supervision, and learning support, so that the quality of neonatal care is improved, and the survival rate of neonates is improved.

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