



“A Study to Assess the Effectiveness of Simulation based Neonatal Resuscitation on the Confidence Level among Nursing Students in Selected Nursing Colleges of Metropolitan City.”

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Neonatal resuscitation, simulation-based training, nursing students, confidence, experiential learning.

ABSTRACT:

Background: Neonatal resuscitation is a critical intervention for infants who fail to initiate breathing at birth, with birth asphyxia being a leading cause of neonatal mortality globally. In India, neonatal deaths remain high despite the availability of training programs such as the Neonatal Resuscitation Program (NRP). Nurses play a pivotal role in managing neonatal emergencies; however, studies have shown that many lack adequate knowledge, practical skills, and confidence in performing neonatal resuscitation. Simulation-based training has emerged as an effective method to enhance clinical competence, decision-making, and confidence in a safe, controlled environment.

Objective: This study aimed to assess the effectiveness of simulation-based neonatal resuscitation training on the confidence of nursing students.

Methods: A quasi-experimental, non-equivalent pre-test post-test control group design was employed. Eighty 6th-semester nursing students from selected colleges were purposively sampled and divided equally into experimental (n=40) and control (n=40) groups. The experimental group received structured simulation-based training, while the control group not received any instruction. Data were collected using a self-structured questionnaire and a modified confidence assessment scale, and analyzed using descriptive and inferential statistics.

Results: Pretest scores indicated low confidence across both groups. Post-intervention, the experimental group showed a significant increase in confidence, with 87.5% achieving moderate and 15.0% attaining high confidence levels, whereas the control group demonstrated no significant change. Comparative analysis confirmed that simulation-based training significantly enhanced students' confidence in neonatal resuscitation. No significant association was observed between demographic variables and baseline confidence levels.

Conclusion: Simulation-based neonatal resuscitation training is highly effective in improving the confidence of nursing students, bridging the gap between theoretical knowledge and clinical practice. Structured simulation sessions foster critical thinking, psychomotor skills, teamwork, and decision-making, preparing students to respond competently in real-life neonatal emergencies. Incorporating simulation into nursing curricula can strengthen clinical readiness and improve patient safety outcomes.

INTRODUCTION

The birth of a newborn is a moment of immense joy and expectation, yet the first minutes of life are critical due to rapid physiological adjustments. While most newborns transition successfully, about 10% require some form of resuscitative assistance. Failure to provide timely intervention can result in severe

complications, including cerebral palsy, learning disabilities, and even death. Birth asphyxia is a leading cause of neonatal mortality globally, accounting for approximately 900,000 deaths annually, with India contributing significantly to this burden. Neonatal resuscitation is a vital emergency procedure to support infants who fail to initiate breathing, thus preventing irreversible organ injury and death.



Qualified clinicians, especially nurses and midwives, play a pivotal role in managing neonatal emergencies. Early recognition of cardiorespiratory complications, prompt cardiopulmonary resuscitation (CPR), and adherence to standardized guidelines, such as those published by the International Liaison Committee on Resuscitation (ILCOR) and the American Academy of Pediatrics (AAP), are essential for improving survival outcomes. In India, the Neonatal Resuscitation Program (NRP) has trained thousands of healthcare professionals to ensure skilled care during delivery, yet the scale of training remains insufficient given the high birth rate.

Simulation-based training has emerged as an effective method to enhance learning, decision-making, and confidence among healthcare providers. Through realistic, hands-on scenarios,

learners can acquire practical skills in a zero-risk environment, enabling them to respond competently to neonatal emergencies. Studies show that many nurses lack adequate knowledge and confidence in neonatal resuscitation, emphasizing the need for structured and repeated training. Simulation not only improves technical competence but also fosters critical thinking, teamwork, and rapid response in high-pressure situations. This study focuses on assessing the knowledge, skills, and confidence of nursing students and healthcare workers in performing neonatal resuscitation effectively through simulation-based training.

NEED FOR THE STUDY

Neonatal mortality remains a pressing global concern, with the first 28 days of life being the most vulnerable period. According to UNICEF (2023), approximately 6,300 neonatal deaths occur daily, with premature birth, birth asphyxia, infections, and congenital anomalies being the leading causes. Sub-Saharan Africa and South Asia experience the highest neonatal mortality rates, highlighting disparities in access to quality intrapartum and newborn care. Birth asphyxia alone accounts for a substantial proportion of early neonatal deaths, many of which are preventable with timely resuscitation.

Despite global efforts, many healthcare providers, particularly nurses and midwives, remain inadequately trained in neonatal resuscitation. Studies indicate limited knowledge, confidence, and practical skills among nursing staff, increasing the risk of adverse

outcomes. Simulation-based training has been shown to enhance learning retention, decision-making, and hands-on competence without jeopardizing patient safety.

From my clinical experience, I have observed that nurses often hesitate during neonatal emergencies due to lack of confidence or insufficient practical exposure. Incorporating structured simulation-based training can bridge this gap, equipping healthcare providers with essential skills and improving neonatal survival rates. This study aims to evaluate the effectiveness of such training in enhancing knowledge, practical skills, and confidence among nurses and healthcare workers, ultimately contributing to improved neonatal outcomes and reduced mortality in high-risk deliveries.

METHODOLOGY

Research Approach and Design

This study employed a **quantitative research approach** to evaluate the effectiveness of simulation-based neonatal resuscitation training on the confidence of nursing students. A **quasi-experimental, non-equivalent pre-test post-test control group design** was adopted. The target population included 6th-semester nursing students, with the accessible population being students from selected nursing colleges in a metropolitan city. A total of **80 students** were selected using **non-probability purposive sampling** based on their willingness and availability to participate in the study.

Study Tool and Variables

Data were collected using a **self-designed structured questionnaire** and a **modified confidence assessment scale**. The **independent variable** was simulation-based neonatal training, and the **dependent variable** was the students' confidence in performing neonatal resuscitation.

Data Collection Procedure

The experimental group underwent a pre-test, followed by a structured **simulation session**, and then a post-test. The control group was assessed through pre- and post-tests without the simulation intervention.

Data Analysis

Data were analyzed and interpreted using descriptive and inferential statistics to determine the effectiveness of the simulation training. The study aimed to enhance students' knowledge, practical skills, and confidence,



ensuring readiness to manage neonatal emergencies effectively.

Communication

Findings were communicated through tables, graphs, and statistical summaries, highlighting significant improvements in confidence and practical competency among students exposed to simulation-based training.

RESULT

Section I: Demographic Characteristics of Nursing Students

A total of 80 nursing students participated in the study, equally divided into experimental (n=40) and control (n=40) groups. The majority of participants were aged 21–22 years, with 42.5% in the experimental group and 55.0% in the control group aged 21 years, and 45.0% in the experimental group and 25.0% in the control group aged 22 years. Male students comprised 20.0% of the experimental group and 22.5% of the control group, while females accounted for 80.0% and 77.5%, respectively. Academic performance predominantly fell within the 66–75% range, with 65.0% in the experimental group and 47.5% in the control group. All students (100%) in both groups had previous pediatric unit postings, and none had participated in prior simulation training sessions.

Section II: Finding related to Confidence Scores in Neonatal Resuscitation – Experimental Group

In the experimental group, the pretest confidence scores of nursing students averaged 47.4%, which increased significantly to 66.7% following the simulation-based intervention. Item-wise analysis revealed marked

Section V: finding related to Level of Confidence – Experimental Group

Table no. 1: Level of confidence in students from experiment group N= 40

Level of confidence	Modified Score	Experiment Group				Chi Square test	P-Value	Sig. at 5% level
		Pre Test	%	Post Test	%			
Low Confidence	15 – 45	40	100.0	5	12.5	62.222**	0.000	yes
Moderate Confidence	46 – 60	0	0.0	35	87.5			

improvements across all domains of neonatal resuscitation, including knowledge, skill performance, team communication, and post-resuscitation care. These findings indicate that simulation-based training was effective in enhancing students' confidence, demonstrating that experiential learning interventions can bridge gaps between theoretical knowledge and practical skills.

Section III: Finding related to Confidence Scores in Neonatal Resuscitation – Control Group

In contrast, the control group showed minimal improvement, with pretest scores averaging 47.0% and posttest scores only slightly increasing to 48.1%. Item-wise evaluation revealed negligible changes across knowledge, skill performance, team communication, and post-resuscitation care. These results suggest that conventional teaching methods alone may not significantly improve nursing students' confidence in performing neonatal resuscitation, emphasizing the importance of active, simulation-based learning for meaningful skill and confidence development.

Section IV: finding related to Comparison of Pretest and Posttest Confidence Between Groups

Significant improvements were observed in the experimental group after simulation-based training (pretest mean = 35.53, posttest mean = 50.03, SD = 5.2035 vs. 4.5601; Wilcoxon signed-rank test, $p < 0.001$). The control group demonstrated no statistically significant change (pretest mean = 35.20, posttest mean = 36.05, SD = 5.3625 vs. 4.6074, $p > 0.05$), confirming the effectiveness of simulation in enhancing confidence in neonatal resuscitation.



High Confidence	61 – 75	0	0.0	0	0.0			
Total		40	100.0	40	100.0			

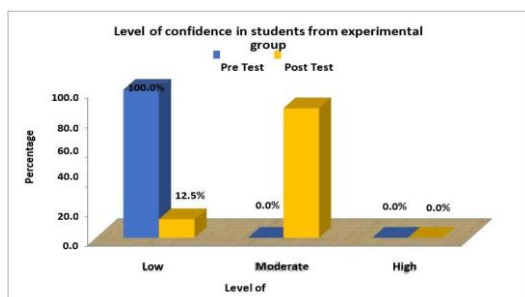


Figure no. 1: Level of confidence in students from experimental group

Prior to the intervention, 100% of students in the experimental group exhibited low confidence in performing neonatal resuscitation. Following the simulation-based training, there was a significant improvement: 87.5% of students achieved moderate confidence, while 15.0% attained high confidence. These results indicate that the simulation intervention was highly effective in enhancing students' confidence levels, demonstrating the value of hands-on, experiential learning in preparing nursing students for neonatal resuscitation tasks.

Section VI: finding related to Level of Confidence – Control Group

Table no. 15: Level of confidence in students of control group

N= 40

Level of confidence	Modified Score	Control Group				Chi Square test	P-Value	Sig. at 5% level
		Pre Test	%	Post Test	%			
Low Confidence	15 – 45	40	100.0	40	100.0	0.000	1.000	Not
Moderate Confidence	46 – 60	0	0.0	0	0			
High Confidence	61 – 75	0	0.0	0	0			
Tot		40	100.0	40	100.0			

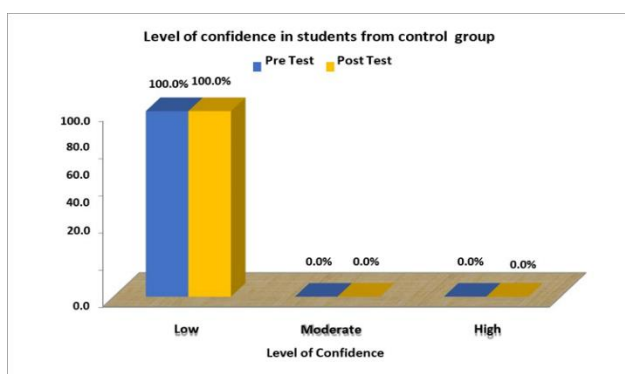


Figure no. 2: Level of confidence in students from control group

In the control group, 100% of students initially displayed low confidence, and this pattern remained largely unchanged after the study period. Post-test assessment showed that all students continued to have low confidence, with no participants achieving moderate or high confidence levels.

Section VII: finding related to Effectiveness of Simulation

Comparative analysis between pretest and posttest confidence levels showed significant enhancement in the experimental group, confirming that simulation-based neonatal resuscitation training effectively



improves confidence (H1 accepted; H0 rejected).

Section VIII: finding related to Association between Demographic Variables and Confidence

Chi-square analysis demonstrated no significant associations between pretest confidence scores and age, gender, or academic performance in either group ($p>0.05$). These results suggest that demographic characteristics did not influence baseline confidence levels among nursing students.

DISCUSSION

The present study evaluated the effectiveness of simulation-based teaching on the confidence of nursing students in performing neonatal resuscitation.

Before the intervention, all students in both groups demonstrated low confidence. After simulation-based training, 87.5% of students in the experimental group achieved moderate confidence, and 15.0% attained high confidence, whereas the control group showed no improvement. This finding demonstrates that simulation effectively enhances students' self-assurance and readiness to perform neonatal resuscitation procedures. Wichamjailiu Ringkangmai (2019), who found that simulation of neonatal basic life support (BLS) among nursing students significantly improved their knowledge, skills, and confidence levels, reinforcing the role of experiential learning in clinical education, reported similar results.

The positive outcomes in this study can be attributed to the interactive, hands-on nature of simulation, which allows learners to bridge theoretical knowledge with clinical practice while receiving real-time feedback. This aligns with the findings of Chae and Shon (2024), who demonstrated that simulation-based interprofessional education (IPE) significantly improved teamwork, communication, clinical performance, and clinical judgment among neonatal intensive care unit staff. Their study highlights how simulation promotes collaboration, situational awareness, and confidence—key elements also essential for effective neonatal resuscitation.

Overall, this study confirms that simulation-based teaching is an effective educational approach to enhance confidence and performance in neonatal resuscitation. Incorporating structured simulation sessions into nursing curricula can strengthen clinical preparedness and foster professional competence among nursing students.

CONCLUSION

The present study concluded that simulation-based teaching is highly effective in enhancing the confidence of nursing students in performing neonatal resuscitation. Before the intervention, all participants exhibited low confidence levels. However, after the simulation-based training, the majority of students in the experimental group demonstrated moderate to high confidence, whereas the control group showed no significant improvement. Simulation provides a safe, realistic, and interactive environment that allows learners to apply theoretical knowledge, develop psychomotor and decision-making skills, and receive immediate feedback. It also promotes critical thinking, teamwork, and effective communication, which are essential for managing neonatal emergencies. The experiential learning process helps bridge the gap between theory and practice, ensuring that students are better prepared to deliver competent and confident neonatal care.

Overall, the findings highlight the importance of incorporating simulation-based education into nursing curricula to strengthen clinical preparedness and confidence among students. Regular exposure to simulation scenarios can enhance their ability to respond effectively in real-life neonatal resuscitation situations, thereby improving the quality of patient care and safety outcomes in clinical practice.

Conflict of Interest

The authors certify that they have no involvement in any organization or entity with any financial or non-financial interest in the subject matter or materials discussed in this paper.

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