

Effects of Training on Healthcare Workers Practice of Neonatal Resuscitation in Primary Healthcare Centers in Rivers State

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| Article History | Abstract |
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| Original Research Article | <p><i>This study investigated effects of training on healthcare workers in practice of resuscitation within the first-five-minutes of life in primary healthcare centres in Rivers State. A quasi-experimental (pretest, post-test) study design was adopted. The study population comprised of 743 healthcare workers in the labour wards in the primary health care facilities in Rivers State. The sample size for the study was 389 which was selected using the multi-stage sampling method. Data was collected using an observation checklist that has the steps of basic neonatal resuscitation, adopted from the WHO guideline for neonatal resuscitation skills. Data was collected by in three phases – pretest, training and posttest. Data was analyzed with the aid of the Statistical Product and Service Solution (SPSS V-27) using percentage, mean, Paired sample t-test and Analysis of Covariance (ANCOVA). The result showed that, at the baseline, the practice of neonatal resuscitation was poor (1.74±0.45) but, the training of healthcare workers had a positive effect on the practice of neonatal resuscitation. Based on the finding of the study, it was concluded that training is a veritable tool in influencing the knowledge of neonatal resuscitation among healthcare workers in primary healthcare facilities in Rivers State. It was recommended that healthcare facilities prioritize the provision of necessary resuscitation equipment to support effective neonatal care. This includes ensuring the availability of resuscitation tools and ensuring regular maintenance of equipment.</i></p> <p>Keywords: Training, Healthcare Workers, Practice, Neonatal Resuscitation.</p> |
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Introduction

Neonatal resuscitation is a critical intervention that can reduce neonatal morbidity and mortality, particularly within the first five minutes of life. The initial moments after birth are vital for ensuring the infant's transition from intrauterine to extrauterine life, where interventions such as airway management, positive pressure ventilation, and chest compressions may be required (Mihretie et al., 2024). The "Golden Minute" refers to the first minute after birth, during which timely resuscitation can have a significant impact on the neonate's survival and long-term health outcomes (Girish & Subramaniam, 2019). The ability of healthcare workers, especially those in primary healthcare centres, to effectively perform neonatal resuscitation is

crucial, as these settings are often the first point of contact for newborns in many regions.

Training programs, such as the Neonatal Resuscitation Program (NRP) endorsed by the World Health Organization (WHO) and the American Academy of Pediatrics (AAP), are designed to improve healthcare workers' skills and knowledge in neonatal care, particularly resuscitation (Olaniyi & Ncama, 2020). These training programs focus on key interventions that healthcare providers must be familiar with, including maintaining the airway, initiating positive pressure ventilation, and performing chest compressions when necessary. Studies have shown that healthcare workers who undergo such

training have better knowledge, improved technical skills, and more confidence in their ability to manage neonatal emergencies (Sintayehu et al., 2020). However, the effectiveness of these training programs in improving the practice of neonatal resuscitation, particularly in low-resource settings such as primary healthcare centres in Rivers State, remains a critical issue that requires further investigation.

The primary healthcare sector in Rivers State plays a pivotal role in providing essential health services to the population, including neonatal care. However, healthcare workers in these centres often face significant challenges, including inadequate training, limited resources, and high patient loads, which can affect their ability to perform effective neonatal resuscitation (Shikuku et al., 2018). A lack of proper training in neonatal resuscitation can lead to delays in initiating necessary interventions, increasing the risk of neonatal morbidity and mortality. Research indicates that neonatal resuscitation is highly dependent on the skills of healthcare providers, and inadequate skills can result in preventable deaths and long-term complications for newborns (Skidmore & Urquhart, 2001). Therefore, understanding the impact of training on healthcare workers' practices in neonatal resuscitation is crucial for improving neonatal survival rates in primary healthcare centres.

In Rivers State, where neonatal mortality rates remain high, there is a pressing need to assess the effectiveness of neonatal resuscitation training in primary healthcare settings. Despite the availability of training programs, many healthcare workers still lack the necessary skills to manage neonatal emergencies effectively (Olaniyi & Ncama, 2020). Studies suggest that continuous professional development and in-service training can lead to improved practices and better neonatal outcomes (Shastri, 2021). This research aims to examine the effects of neonatal resuscitation training on healthcare workers' practices in primary healthcare centres in Rivers State, particularly within the critical first five minutes of life.

Effective resuscitation training not only improves healthcare workers' technical skills but also enhances their decision-making abilities during neonatal emergencies. According to the WHO (2022), neonatal resuscitation training is essential to reduce preventable neonatal deaths and improve outcomes for newborns at risk of asphyxia. In regions like Rivers State, where healthcare infrastructure may be lacking, enhancing the skills of healthcare workers through targeted training could significantly impact neonatal survival rates. This research will contribute to understanding how training affects the practice of neonatal resuscitation in primary healthcare centres and provide valuable insights into strategies for improving neonatal care in the region.

Therefore, this study seeks to investigate the effects of training on healthcare workers in the practice of neonatal resuscitation within the first five minutes of life at primary healthcare centres in Rivers State. By assessing the skills, and practices of healthcare workers before and after training, the study will explore whether these training programs lead to tangible improvements in neonatal resuscitation outcomes and, ultimately, the survival and well-being of newborns in the region.

Research Question

The following research questions guided the study

1. What is the practice/skill of health care workers, on neonatal resuscitation using a standard checklist in primary healthcare centers in Rivers state?
2. What effects does training have on healthcare workers in PHC centers in rivers state on the practice/skill of neonatal resuscitation using a standard checklist?

Hypotheses

The following hypotheses also guided the study

1. There is no significant difference between the practice/skill of health care workers before and after training on neonatal resuscitation within the first-five-minutes of life in primary healthcare centers in rivers state.
2. There is no significant effect of training on practice of neonatal resuscitation after controlling for socio-demographic variables (age, years of work experience and qualification).

Methodology

The study employed a quasi-experimental design (pretest, post-test) to assess the effectiveness of neonatal resuscitation training among healthcare workers in Rivers State. The study population consisted of 743 healthcare workers, including nurses, midwives, Community Health Extension Workers (CHEWs), and Community Health Officers (CHOs) who were involved in the delivery process in the labour wards of primary healthcare facilities across Rivers State (Source: Primary Health Care Management Board of Rivers State). A sample size of 389 healthcare workers was selected using a multi-stage sampling technique.

An observation checklist, based on the WHO guidelines for neonatal resuscitation, was used to assess the steps of basic neonatal resuscitation. A simulated environment for neonatal resuscitation was set up, where participants used manikins to demonstrate their resuscitation skills. The observation checklist was used to evaluate the healthcare workers' skills in neonatal resuscitation. In addition, a self-structured, validated questionnaire was administered to gather data on other aspects of the study objectives. The

data for this study was exclusively sourced from primary data obtained directly from the healthcare providers.

Ethical approval was obtained from both the University of Port Harcourt School of Ethical Review and the Rivers State Health Research Ethical Committee, with further permission granted by the Rivers State Hospital Management Board. A formal letter of permission was also received from the Primary Health Care Management Board, ensuring compliance with the required ethical standards and protocols.

Data collection was carried out in three phases. First, the researcher scheduled training sessions with the heads of the healthcare workers in the selected Local Government Areas (LGAs), where clarification was provided for any questions or concerns. After the training dates were set, the researcher, accompanied by a research assistant, visited the primary healthcare centres to explain the study procedure and provide instructions on completing the questionnaire. Respondents were then selected and invited to a central venue in each LGA for training and practice in neonatal resuscitation. A comprehensive lecture note was used during the two-day training sessions, with each day dedicated to one of the training objectives (pre and post training). Questionnaires were distributed both before and after the training to assess the immediate impact of the training. Each participant received 10 minutes of individual attention during the session.

A follow-up visit was made one month after the initial training, where the researcher, with the assistance of the research assistant, evaluated the healthcare workers' resuscitation skills without any additional training or teaching. The pre- and post-training skills were compared to assess the impact of the training on the participants' practice.

The collected data was entered into Statistical Package for the Social Sciences (SPSS) Version 27 for analysis. The data was coded, cleaned, and analysed using both Excel and SPSS software. Descriptive statistics, including measures of central tendency, dispersion, frequency distribution tables, and percentages, were employed to analyse the data. The mean was calculated to compare different quantities, while the standard deviation was used to measure the dispersion of the data. Frequency distribution tables presented socio-demographic information, while mean values were used for comparisons of pre- and post-training data. Inferential statistics, including paired sample t-tests and Analysis of Covariance (ANCOVA), were used to test the study's hypotheses.

Results

The sample size for the study was 389 but the baseline analysis was based on 373 because the researcher was not able to retrieve all copies of the questionnaire.

Table 1: Percentage distribution of respondents' socio-demographic information (n = 373)

| Socio-demographic variables | Frequency | Percentage |
|---|-----------|------------|
| Age | | |
| 20 - 29 | 118 | 31.6 |
| 30 - 39 | 115 | 30.8 |
| 40 - 49 | 98 | 26.3 |
| 50 - 59 | 42 | 11.3 |
| Sex | | |
| Male | 42 | 11.3 |
| Female | 331 | 88.7 |
| Qualification | | |
| RN/RM | 92 | 24.7 |
| Midwife | 67 | 18.0 |
| Nurse | 57 | 15.3 |
| CHEW | 86 | 23.1 |
| CHO | 71 | 19.0 |
| Years of work experience | | |
| 1 - 6 | 160 | 42.9 |
| 7 - 12 | 135 | 36.1 |
| 13 - 18 | 42 | 11.3 |
| 19 - 24 | 36 | 9.7 |
| Years of experience in labour ward | | |
| 1 - 5 | 145 | 38.9 |
| 6 - 10 | 157 | 42.1 |

| | | |
|---------------------|-----|------|
| 11 - 15 | 45 | 12.0 |
| 16 - 20 | 26 | 7.0 |
| Religion | | |
| Christianity | 232 | 62.2 |
| Muslim | 74 | 19.8 |
| Tradition | 51 | 13.7 |
| Others | 16 | 4.3 |

Table 1 displays the distribution of respondents' socio-demographic characteristics. The data indicates that 118 (31.6%) of the respondents were in the age group of 20-29 years, 115 (30.8%) were aged 30-39 years, and 42 (11.3%) were between 50-59 years. A significant majority, 331 (88.7%), were females, while 42 (11.3%) were males. In terms of qualifications, 92 (24.7%) were Registered Nurses/Registered Midwives (RN/RM), 86 (23.1%) were Community Health Extension Workers (CHEW), 71

(19.0%) were Community Health Officers (CHO), 67 (18.0%) were midwives, and 57 (15.3%) were nurses. Nearly half, 160 (42.9%), had between 1-6 years of work experience, while 135 (36.1%) had 7-12 years of work experience. Additionally, 145 (38.9%) had 1-5 years of experience working in the labour ward. Regarding religious affiliation, 232 (62.2%) were Christians, 74 (19.8%) were Muslims, and 51 (13.7%) followed Traditional religious practices.

Table 2: Baseline practice of health care workers, on neonatal resuscitation (n = 373)

| SN | Items | Mean | S.D | Remark |
|----|---|------|------|--------|
| 1 | Participant put on gloves | 3.77 | 0.79 | Good |
| 2 | Participant turn on the overhead warmer | 1.42 | 0.93 | Poor |
| 3 | Placed at least two warm towels at the resuscitation unit? | 2.21 | 0.85 | Poor |
| 4 | Placed the ventilation device (e.g. bag and mask) at the resuscitation unit + checked the functionality of the device | 2.43 | 0.98 | Poor |
| 5 | Checked whether the mask size is appropriate for the estimated weight of the newborn | 2.25 | 1.10 | Poor |
| 6 | Participant test and prepare the suction unit | 2.30 | 0.98 | Poor |
| 7 | Participant prepare monitoring device (e.g. SpO2) | 1.18 | 0.6 | Poor |
| 8 | Participant connect the oxygen tubing to the ventilation device (e.g. bag-mask valve) | 1.72 | 1.04 | Poor |
| 9 | Participant place the stethoscope at the resuscitation unit | 3.25 | 1.17 | Good |
| 10 | Participant prepare for additional specific interventions such as intravenous access, fluid, airway equipment, medication | 1.81 | 1.23 | Poor |
| | Resuscitation | 3.62 | 0.88 | Good |
| 11 | Participant note time of delivery | 2.66 | 0.74 | Good |
| 12 | Attended to temperature management (radiant warmer, warm towels) | 2.61 | 0.75 | Good |
| 13 | Received the baby with a warm towel, dries, stimulates and covers with a dry towel | 3.32 | 0.76 | Good |
| 14 | Lightly suction mouth then nose if secretions are present, | 3.01 | 0.74 | Good |
| 15 | Assessed respiration and heart rate within 6 seconds and multiply by 10 | 2.48 | 1.20 | Poor |
| 16 | Use appropriate bag and mask size | 2.07 | 1.28 | Poor |
| 17 | Commence oxygen administration | 2.67 | 1.23 | Good |
| 18 | Positioned neonate in a sniffing position | 2.87 | 1.14 | Good |

| | | | | |
|----|--|-------------|-------------|-------------|
| 19 | Placed mask appropriately on child's nose and mouth with a C-curved hand | 2.93 | 0.91 | Good |
| 20 | Correctly identified need for assisted ventilation | 2.51 | 1.03 | Good |
| 21 | Ventilated with bag and mask in a rhythmical order of "breathe-two-and-three, breathe-two-and-three" | 2.54 | 1.06 | Good |
| 22 | Continue positive pressure inflations for another 30seconds after assessing low heart rate | 2.72 | 1.10 | Good |
| 23 | Assessed chest wall movement during the time of inflation | 2.04 | 0.97 | Poor |
| 24 | Assessed heart rate after 30 seconds of effective inflation | 2.14 | 1.34 | Poor |
| 25 | Asked for additional help before CPR begin | 2.50 | 1.35 | Good |
| 26 | Asked for additional help after CPR begin | 3.16 | 1.91 | Good |
| 27 | Participant assessed for circulation | 3.20 | 1.20 | Good |
| 28 | Initiated chest compression if heart rate is below 60b/m after bagging for 15- 30 seconds | 2.72 | 1.23 | Good |
| 29 | Used the correct CPR algorithm | 2.08 | 1.12 | Poor |
| 30 | Assessed the heart rate after every 30 seconds of CPR | 2.08 | 1.20 | Poor |
| 31 | Stop chest compression for heart rate assessment | 2.68 | 1.30 | Good |
| 32 | Made the right decision whether to stop or to continue chest compression | 3.14 | 1.09 | Good |
| 33 | Assessed the newborn's breathing after chest compression was ceased | 1.78 | 0.92 | Poor |
| 34 | Participant continued with assisted inflations | 1.43 | 0.91 | Poor |
| 35 | Participants obtained intravenous or intraosseous access | 1.43 | 0.91 | Poor |
| | Grand mean | 2.49 | 1.05 | Poor |

Criterion mean = 2.50

Table 2 present the baseline practice of health care workers, on neonatal resuscitation. The result showed that the grand mean of 2.49 ± 1.05 was less than the criterion mean of 2.50, indicating that at the baseline, the practice of neonatal resuscitation was poor. Though good practice was found in the practices such as: putting on gloves (3.77 ± 0.79), placing the stethoscope at the resuscitation unit (3.25 ± 1.17), prepared for additional specific interventions such as intravenous access, fluid, airway equipment, medication (3.62 ± 0.88), lightly suction mouth then nose if secretions are present (3.01 ± 0.74), commence oxygen administration

(2.67 ± 1.23), positioned neonate in a sniffing position (2.87 ± 1.14), placed mask appropriately on child's nose and mouth with a C-curved hand (2.93 ± 0.91), ventilated with bag and mask in a rhythmical order of "breathe-two-and-three, breathe-two-and-three" (2.54 ± 1.06), continue positive pressure inflations for another 30seconds after assessing low heart rate (2.72 ± 1.10), initiated chest compression if heart rate is below 60b/m after bagging for 15- 30 seconds (2.72 ± 1.23), and made the right decision whether to stop or to continue chest compression (3.14 ± 1.09).

Table 3: Baseline and posttest practice of health care workers on neonatal resuscitation (n = 373)

| SN | Items | Baseline | | 1 st Posttest | | 2 nd Posttest | | Mean diff |
|----|---|----------|------|--------------------------|------|--------------------------|------|-----------|
| | | Mean | S.D | Mean | S.D. | Mean | S.D. | |
| 1 | Participant put on gloves | 3.77 | 0.79 | 3.86 | 0.63 | 3.79 | 0.42 | 0.09 |
| 2 | Participant turn on the overhead warmer | 1.42 | 0.93 | 3.86 | 1.05 | 3.52 | 0.35 | 2.1 |
| 3 | Placed at least two warm towels at the resuscitation unit? | 2.21 | 0.85 | 3.86 | 1.04 | 2.86 | 0.35 | 0.65 |
| 4 | Placed the ventilation device (e.g. bag and mask) at the resuscitation unit + checked the functionality of the device | 2.43 | 0.98 | 3.87 | 0.74 | 3.75 | 0.34 | 1.32 |

| | | | | | | | | |
|----|---|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| 5 | Checked whether the mask size is appropriate for the estimated weight of the newborn | 2.25 | 1.10 | 3.90 | 0.88 | 3.61 | 1.53 | 1.36 |
| 6 | Participant test and prepare the suction unit | 2.30 | 0.98 | 3.86 | 1.22 | 2.66 | 0.35 | 0.36 |
| 7 | Participant prepare monitoring device (e.g. SpO2) | 1.18 | 0.60 | 3.78 | 1.28 | 1.71 | 0.41 | 0.53 |
| 8 | Participant connect the oxygen tubing to the ventilation device (e.g. bag-mask valve) | 1.72 | 1.04 | 3.72 | 0.68 | 3.75 | 0.43 | 2.00 |
| 9 | Participant place the stethoscope at the resuscitation unit | 3.25 | 1.17 | 3.97 | 0.16 | 3.81 | 0.39 | 0.72 |
| 10 | Participant prepare for additional specific interventions such as intravenous access, fluid, airway equipment, medication | 3.18 | 1.23 | 3.70 | 1.42 | 2.13 | 0.46 | 0.32 |
| 11 | Participant note time of delivery | 2.66 | 0.74 | 3.75 | 0.70 | 3.38 | 0.43 | 0.72 |
| 12 | Attended to temperature management (radiant warmer, warm towels) | 2.61 | 0.75 | 3.88 | 0.95 | 3.24 | 0.32 | 0.63 |
| 13 | Received baby with a warm towel, dries, stimulates and covers with a dry towel | 3.32 | 0.76 | 3.87 | 1.23 | 2.89 | 0.34 | -0.43 |
| 14 | Lightly suction mouth then nose if secretions are present, | 3.01 | 0.74 | 3.78 | 0.99 | 3.29 | 0.42 | 0.28 |
| 15 | Assessed respiration and heart rate within 6 seconds and multiply by 10 | 2.48 | 1.20 | 3.59 | 0.83 | 3.63 | 0.49 | 1.15 |
| 16 | Use appropriate bag and mask size | 2.07 | 1.28 | 3.86 | 0.74 | 3.75 | 0.35 | 1.68 |
| 17 | Commence oxygen administration | 2.67 | 1.23 | 3.83 | 0.69 | 3.82 | 0.38 | 1.15 |
| 18 | Positioned neonate in a sniffing position | 2.87 | 1.14 | 3.84 | 0.95 | 3.66 | 0.37 | 0.79 |
| 19 | Placed mask appropriately on child's nose and mouth with a C-curved hand | 2.93 | 0.91 | 3.87 | 0.85 | 3.60 | 0.34 | 0.67 |
| 20 | Correctly identified need for assisted ventilation | 2.51 | 1.03 | 3.80 | 1.13 | 3.17 | 0.4 | 0.66 |
| 21 | Ventilated with bag and mask in a rhythmical order of "breathe-two-and-three, breathe-two-and-three" | 2.54 | 1.06 | 3.67 | 2.04 | 3.04 | 0.47 | 0.5 |
| 22 | Continue positive pressure inflations for another 30seconds after assessing low heart rate | 2.72 | 1.10 | 3.82 | 0.71 | 3.57 | 0.39 | 0.85 |
| 23 | Assessed chest wall movement during the time of inflation | 2.04 | 0.97 | 3.61 | 1.30 | 2.21 | 0.49 | 0.17 |
| 24 | Assessed heart rate after 30 seconds of effective inflation | 2.14 | 1.34 | 3.57 | 1.18 | 3.40 | 0.59 | 1.26 |
| 25 | Asked for additional help before CPR begin | 2.50 | 1.35 | 3.79 | 1.35 | 2.13 | 0.42 | -0.37 |
| 26 | Asked for additional help after CPR begin | 3.16 | 1.91 | 3.86 | 1.25 | 2.95 | 0.35 | -0.21 |
| 27 | Participant assessed for circulation | 3.20 | 1.20 | 3.86 | 1.12 | | 0.35 | 0.29 |
| 28 | Initiated chest compression if heart rate is below 60b/m after bagging for 15- 30 seconds | 2.72 | 1.23 | 2.95 | 1.35 | 3.87 | 0.34 | 0.23 |
| 29 | Used the correct CPR algorithm | 2.08 | 1.12 | 3.90 | 1.17 | 2.10 | 1.53 | 0.02 |
| 30 | Assessed the heart rate after every 30 seconds of CPR | 2.08 | 1.20 | 3.86 | 1.24 | 2.67 | 0.35 | 0.59 |
| 31 | Stop chest compression for heart rate assessment | 2.68 | 1.30 | 3.78 | 1.06 | 3.49 | 0.41 | 0.81 |
| 32 | Made the right decision whether to stop or to continue chest compression | 3.14 | 1.09 | 3.75 | 0.67 | 3.80 | 0.43 | 0.66 |
| 33 | Assessed the newborn's breathing after chest compression was ceased | 1.78 | 0.92 | 3.81 | 1.30 | 2.75 | 0.39 | 0.97 |
| 34 | Participant continued with assisted inflations | 1.43 | 0.91 | 3.70 | 1.47 | 2.20 | 0.46 | 0.77 |
| 35 | Participants obtained intravenous or intraosseous access | 1.43 | 0.91 | 3.69 | 1.03 | 3.16 | 0.47 | 0.09 |
| | Grand mean | 2.49 | 1.05 | 3.77 | 1.04 | 3.15 | 0.45 | 0.67 |

Criterion mean = 2.50

Table 3 present the baseline and posttest practice of health care workers on neonatal resuscitation. The result showed that the baseline grand mean was 2.49±1.05 and the first posttest grand mean was 3.86±0.63 with a mean difference of 0.67 indicating a positive effect of the training. The second posttest grand mean score of 3.15 was less than the first posttest score, though it was still higher than the baseline practice score. Thus, the training of healthcare workers had a positive effect on the practice of neonatal resuscitation in primary healthcare centers in Rivers State.

Furthermore, the good practice found in baseline versus posttest were: putting on gloves (3.77 vs 3.86), placing the stethoscope at the resuscitation unit (3.25 vs 3.97), prepared

for additional specific interventions such as intravenous access, fluid, airway equipment, medication (3.18 vs 3.70), lightly suction mouth then nose if secretions are present (3.01 vs 3.78), commence oxygen administration (2.67 vs 3.83), positioned neonate in a sniffing position (2.87 vs 3.84), placed mask appropriately on child's nose and mouth with a C-curved hand (2.93 vs 3.87), ventilated with bag and mask in a rhythmical order of "breathe-two-and-three, breathe-two-and-three" (2.54 vs 3.67), continue positive pressure inflations for another 30seconds after assessing low heart rate (2.72 vs 3.82), initiated chest compression if heart rate is below 60b/m after bagging for 15- 30 seconds (2.72 vs 2.95), and made the right decision whether to stop or to continue chest compression (3.14 vs 3.75).

Table 4: Paired sample t-test showing difference between the baseline practice and posttest practice of neonatal resuscitation

| Paired Variables | N | Mean | SD | df | t-value | p-value | Decision |
|-------------------|-----|------|------|-----|---------|---------|-------------------------|
| Baseline practice | 373 | 2.49 | 1.05 | 372 | 4.31 | 0.03* | H ₀ Rejected |
| Posttest practice | 364 | 3.86 | 0.63 | | | | |

*Significant; $p < 0.05$

Table 4 showed that there was a statistically significant difference between the baseline practice and posttest practice of neonatal resuscitation as the p-value = 0.03 was less than 0.05 (t-value = 4.31, df = 372, $p < 0.05$). Thus, the null hypothesis which stated that there is no significant

difference between the practice of health care workers before and after training on neonatal resuscitation within the first-five-minutes of life in primary healthcare centers in Rivers State was rejected.

Table 5: Analysis of Covariate (ANCOVA) on effect of training on practice of neonatal resuscitation after controlling for socio-demographic variables

| Source | Type III Sum of Squares | df | Mean Square | F | Sig. | Partial eta square |
|--------------------------|-------------------------|-----|-------------|-------|------|--------------------|
| Corrected Model | 18.776 ^a | 1 | 1.878 | 9.887 | .000 | .000 |
| Intercept | 1.797 | 1 | 1.797 | .901 | .002 | .343 |
| age*practice | 9.842 | 2 | 4.921 | .247 | .001 | .781 |
| Experience * practice | 1.469 | 4 | 3.672 | .184 | .002 | .947 |
| Qualification * practice | 2.085 | 3 | 6.951 | .349 | .003 | .790 |
| Error | .007 | 362 | 1.994 | | | |
| Total | 11.245 | 373 | | | | |
| Corrected Total | 18.783 | 372 | | | | |

*Significant; $p < 0.05$

Table 5 showed the Analysis of Covariate (ANCOVA) of effect of training on practice of neonatal resuscitation after controlling for socio-demographic variables (age, years of work experience and qualification. The result of the ANCOVA showed that the training had a significant effect practice of neonatal resuscitation after controlling for qualification [F(1,362) = 0.34, $p < 0.05$]. However, only

79.0% ($\omega^2 = 0.79$) of the variance in the post-test score could be explained by the socio-demographic variables. Therefore, the null hypothesis which stated that, there is no significant effect of training on practice of neonatal resuscitation after controlling for socio-demographic variables (age, years of work experience and qualification) was rejected.

Discussion

The result showed that the grand mean of 1.74 ± 0.45 was less than the criterion mean of 2.50, indicating that at the baseline, the practice of neonatal resuscitation was poor. The finding of this study is not in line with that of Mihretie et al. (2024) which revealed that the practice of newborn resuscitation among health care professionals East Africa was poor. The finding of this study is at variance with that of Shastri (2021) whose study among nurses working in neonatal intensive care unit in India showed good practice of neonatal resuscitation at the baseline. The finding of this study is at variance with that of Suresh et al. (2017) whose study showed good practice of neonatal resuscitation at the baseline.

The result of this study is in keeping with that of Kc et al. (2017) study was carried out in Nepal which showed similar findings on the practice of neonatal resuscitation. The finding of this study is in line with that of Suresh et al. (2017) study on the Knowledge and Practices on Neonatal Resuscitation among Nurses in Kanyakumari District Hospitals which revealed similar finding. The finding of this study gives credence to that of Nvonako et al. (2022) whose study on Effect of in-hospital training in newborn resuscitation on the competence of health-care workers in resuscitating newborn infants at birth in Cameroon which showed effect of training on the practice of neonatal resuscitation at baseline.

The result showed that the baseline grand mean was 1.74 ± 0.45 and the posttest grand mean was 3.78 ± 0.45 with a mean difference of 2.01 indicating a positive effect of the training. Thus, the training of healthcare workers had a positive effect on the practice of neonatal resuscitation in primary healthcare centers in Rivers State. The result is in keeping with that of Cetinkaya et al. (2022) study on the level of knowledge about neonatal resuscitation and the effect of education on knowledge levels which showed that training had an effect on the practice of neonatal resuscitation. The finding of this study gives credence to that of Kc et al. (2017) study on retention of neonatal resuscitation in Nepal showed that training had an effect on the practice of neonatal resuscitation.

The finding of this study is similar to that of Nvonako et al. (2022) whose study on in-hospital training in newborn resuscitation on the competence of health-care workers in resuscitating newborn infants at birth showed that the training improved the skill of neonatal resuscitation. The result is in keeping with that of Olaniyi, and Ncama, (2020) study on the influence of neonatal resuscitation training on practice of community health extension workers in managing asphyxiated newborns in rural Nigeria which showed a positive effect of training on the neonatal

resuscitation practice of health extension workers. The result also aligns with that of Sintayehu et al. (2020) on the retention of basic neonatal resuscitation skills by midwives and nurses in Eastern Ethiopia which showed a positive effect of training on the neonatal resuscitation practice.

Conclusion

Based on the finding of the study, it was concluded that training is a veritable tool in influencing practice of neonatal resuscitation among healthcare workers in primary healthcare facilities in Rivers State.

Recommendations

Based on the findings of the study, it is essential that healthcare facilities prioritize the provision of necessary resuscitation equipment to support effective neonatal care. This includes ensuring the availability of resuscitation tools and ensuring regular maintenance of equipment. Addressing the issue of inadequate manpower is also critical, and facilities should consider strategies for improving staff numbers or enhancing teamwork to ensure that sufficient support is available during emergencies.

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