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Research Paper

Exploring the Perception and Experience of Neonatal Resuscitation among Community Health Extension Workers in Nigeria.

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ABSTRACT : *Each year, approximately 10 million babies do not breathe immediately at birth, of which about 6 million require basic neonatal resuscitation. The mainproblem is in low-resource settings, where the health system capacity to provide neonatal resuscitation is inadequate. Neonatal mortality is a worldwide problem and is identified as a priority focus of the World Health Organization.*
Objective:*The study aims to assess the basic knowledge and skills of neonatal resuscitation among community health extension workersin Nigeria.*
Method: *Data was collected from the participants through a semi-structured questionnaire. Information on demographic characteristics, knowledge of newborn care and knowledge and skill of neonatal resuscitation were gathered. Analysis of data was done using SPSS version 25 for the window. The results were presented in tables.*
Results: *One hundred and ten participants were recruited; majority 56.4% were within the age range of 40-49 years. Majority 92.7% of them had no previous training in neonatal resuscitation. There is a significant relationship between those without previous training and poor knowledge of resuscitation (p= 0.04). Majority 88.2% had poor knowledge of neonatal resuscitation but had good knowledge (94.5%) of newborn care, with a mean score of 2.13. There is a significant relationship between age and knowledge of newborn care.*
Conclusion *The knowledge of community health workers about neonatal resuscitation was poor as compared to expectations. It is recommended that training of community birth attendants on neonatal resuscitation is highly desirable.*

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I. INTRODUCTION

Consistently, about 136 million infants are born globally and an expected 10% of these newborns have unclear or poor respiratory strength requiring support to achieve cardiorespiratory stability [1]. Reviving the newborn infants pose a set of task, as a change from dependence placental gas exchange to spontaneous breathing of air may cause a physiological challenge to the newborn within few minutes to some hours after delivery [2]. Most of them merely need basic support, with less than 1% needing advanced resuscitation[1]. Meanwhile, these evaluations are centered on only a few reports in which none has shownSub-Saharan Africa including Nigeria, where the difficulty of perinatal deaths and morbidity is seen to be the highest in the world [3]. Because of the difficulties encountered while transiting from intrauterine environment to extrauterine life, about 5% to 10% of the newly born individuals require some level of dynamic resuscitation at birth (e.g stimulation to breath) [4] and approximately 1% to 10% born in the hospital are stated to need assisted ventilation [5]. The criterion for the resuscitation of the newly born infant can be expectedbefore birth, therefore allowing a favorable chance to select an optimal setting, get approximate equipment ready, and prepare trained personnel. While the transition from foetal life is describedby a series of unique events, the physiological factors influenceresuscitative interventions in the newly born. Physical expansion of the lungs and the establishment of functional residual capacity and increase in alveolar oxygen tension may expedite earnest decrease in pulmonary

vascular resistance which may bring about an increased pulmonary blood flow after birth. The inability to control pulmonary vascular resistance may cause persistent pulmonary hypertension. Similarly, the inability to adequately expand alveolar spaces may bring about intrapulmonary shunting of blood with subsequent hypoxemia.

Although, certain physiological attributes are distinctive to the newly born, others relating to infants still present throughout the neonatal period and into the first month of life. Acute illnesses arising from various conditions linger on to be apparent thereby interrupting their thermoregulatory and respiratory purpose (cyanosis, apnea, gasping, respiratory distress). Even though birth is a physiological course of action that represents the start of life which signifiesa transitional phase that every newborn encounter while departing protected intrauterine environment to uncertain independent extrauterine environment [6].

Immediate appropriate care of a newborn is extremely important for survival, growth, and development of a newborn[7]. During the birth of a newborn or immediately after delivery, the newborn may aspirate if appropriate measures are not taken to create and maintain an open airway. Since birth is the most critical period in the life of an infant, growth, and development are mainly resolvedby the quality of care that the newborn receives at delivery [8]. Prolonged exposure to cold, keeping wet linen with amniotic fluid for a long time and inappropriate drying, and wrapping may result in hypothermia and metabolic problems by cold stress [8].Immediately after birth, attention needs to be shifted to the condition of the newborn. The World Health Organisation states that such consideration is an integral part of care in normal birth [9]. Immediate care entails drying the baby with warm towels while being placed on the mother's abdomen. This skin-to-skin contact is important to maintain the newborn's temperature and foster bonding. Adequate measures must be taken to maintain body temperature, and to ensure that no metabolic problems associated with exposure to cold arise. Also, the airway should be cleared, mucus removed and other materials from the mouth, nose, and throat also removed with a suction device [9].

According to WHO, neonatal asphyxia has been recognized as a major cause of neonatal mortality worldwide, and about 25% of all neonatal deaths are caused by birth asphyxia globally [10]. Neonatal asphyxia is defined by the World Health Organization as the failure to initiate and sustain breathing at birth. Birth asphyxia as a cause of neonatal deaths can be efficiently cared for with suitable resuscitation of the newborn by health care providers who are skilled in neonatal resuscitation[10].

Efficient newborn resuscitation is very critical in reducing the consequence of birth asphyxia approximated to have a mortality of 2 million a year with 99% of deaths from developing countries [11]. Wall et al reaffirm that effective resuscitation at birth can avert about 30% of neonatal deaths [3].Successful resuscitation requires careful understanding by the health-care personnel working in the labour, and newborn units to have adequate skills for prompt neonatal resuscitation[12].

Neonatal resuscitation is a series of interventions conducted at the time of birth to help the newborn establish breathing and circulation. The basic steps in the resuscitation process are critical for reducing neonatal morbidity and mortality. Quite often, it involves simple skills like maintenance of body temperature, drying the body of the neonate and clearing the airways by suctioning [13]. The realization of newborn resuscitation depends on the knowledge, clinical skills of local birth attendants and access to basic equipment, including towels or blankets for drying, a bag and mask resuscitator, and a suction device [14]. A national survey assessing the provision of health services in Africa and Asia released by the United Nations has found that training of health workers and the provision of equipment for newborn resuscitation are not consistently available in all facilities [15]. Studies in various developing countries, including Cameroon, Ethiopia, Kenya, and Nepal, identified the absence of equipment and poor provider's knowledge and skills as some obstacles to a good performance of newborn resuscitation [16]. Therefore, adequate knowledge and awareness of neonatal resuscitation will play a vital role in early diagnosis, appropriate management and, accordingly, reduction of adverse consequences[17]. Some countries have well-established neonatal resuscitation programs aimed at equipping their health personnel with skills for neonatal resuscitation [18]. In a study conducted by Msemo, et al 2013 in Tanzania, it was revealed that providing a newborn, resuscitation by skilled birth attendants trained in Helping Babies Breathe (HBB), reduce neonatal mortality by 47%[19], and competence in neonatal resuscitation among healthcare providers is significant for babies who require assistance to initiate breathing [3]. In Nigeria, adoption and implementation of such programs remain a challenge, especially in Community Health Centres. The study aims to assess the baseline knowledge of neonatal resuscitation practice and skills of community health extension workers in Primary Health Care Centre in Nigeria.

II. METHODS

This study was part of a research that was conducted to explore the knowledge, skill, and practice of semi-skilled birth attendants in neonatal resuscitation practice in Nigeria. It was a community-based study where health extension workers were tested before a neonatal resuscitation training was conducted.

This study employed a descriptive, non-experimental research design. Data was collectedfor the quantitative component using the questionnaire to realize the objective. This method helped to assess an in-depth understanding of knowledge of CHEWs for stronger evidence. The study was conducted in five (5) Local Government Areas of Oyo State, Nigeria. A purposeful non-probability technique was adopted in selecting the Local Government Areas. All the Primary Health Care centers that met the study criteria of providing maternity services were used. The target population for this study was community health extension workers in a low-income community setting. Two (2) participants each were purposefully selected from each PHCs who met the inclusion criteria and were willing to participate, making a total of 110.

All participated in the questionnaire which included demographic characteristics of each participant, knowledge of newborn care, neonatal resuscitation and emergencies. A structured self-administered questionnaire was adapted from Neonatal Resuscitation Training (NRT) and Helping Babies Breathe (HBB) modules of the American Academy of Paediatrics and WHO practical guide on basic newborn resuscitation. It was provided in both English and local language of Yoruba, and each participant was asked to decide in which language they would like to answer the questions. The raw data was captured on an Excel worksheet by the researcher and analyzed with SPSS Version 21 program by the statistician.

The study was approved by both the University of KwaZulu-Natal (UKZN) Biomedical Research Ethics Committee, where the researcher is a student and Oyo State Ethical Committee in Nigeria. All participants were asked to provide written informed consent before participation in the study.

III. RESULTS

Table 1: Demographic Characteristics of respondents

	n	%
Age (Year)		
<40	17	15.5
40-49	62	56.4
>=50	31	28.2
Designation		
Senior CHEWs	87	79.1
Junior CHEWs	23	20.9
Educational level		
Secondary	5	4.5
Technical	63	57.3
Others	42	38.2
Total	110	100

All responded by completing the questionnaires administered to them, giving a respondent rate of 100% with ages ranging from 26-59 years. Majority of them (56.4%) were between the age range of 40-49 years and (28.3%) were >=50years with a mean age of 45.4 ± 2.1 years and median age of 45 years from Yoruba extraction. Majority of them were senior CHEWs out of which (57.3%) had Technical education which means they had at least secondary school education. This indicates that majority of CHEWs are not young health providers, therefore they can handle newborn care (Table 1).

Table 2: **Previous neonatal resuscitation training**

Have you been trained to perform neonatal resuscitation	n	%
Yes	8	7.3
No	102	92.7
Total	110	100

Table 2 showed the previous neonatal resuscitation training where only (7.3%) out of total respondents had received previous training in neonatal resuscitation. Majority of them (92.7%) had no training at all. This indicates a lack of information and awareness about neonatal resuscitation in almost all PHCs in Nigeria.

Table 3: Respondent previous training with knowledge of neonatal resuscitation

Previous training	What should you do in Golden minute				
	Yes (%)	**No (%)**	**Total (%)**	**x^2**	**p-value**
Yes	3 (2.7)	5 (4.6)	8 (7.3)	8.548	0.04
No	12 (8.2)	90 (48.2)	102 (84.5)		
Total	15 (13.6)	95 (86.4)	110 (100)		

Table 3 showed that out of total number of participants with previous training in neonatal resuscitation, only 3 (2.7%) correctly knew what should be done within the golden minute under neonatal resuscitation compared to those without previous training (13.6%). This was scientifically significant with p-value of 0.04. This indicates that without adequate training intervention in neonatal resuscitation for health care providers, there will be no knowledge.

Table 4: Cumulative knowledge score of neonatal resuscitation training before training

Knowledge score of neonatal resuscitation		
	n	%
Good	13	11.8
Poor	97	88.2
Total	110	100
Knowledge score of newborn care		
Good	104	94.5
Poor	6	5.5
Total	110	100

Assessing the knowledge of respondents based on responses to questions on neonatal resuscitation, a mean knowledge of 2.13 was obtained. The pre-test score showed that majority (88.2%) had poor knowledge of neonatal resuscitation even though some of them had had previous training in the past but majority (94.5%) of them had good knowledge of general newborn care (Table 4).

Table 5: Respondent age and years of experience with knowledge of newborn care

Age	Knowledge of Newborn care				
	Yes (%)	**No (%)**	**Total (%)**	**x^2**	**p-value**
<40	15 (13.7)	2 (1.8)	17 (15.5)	7.567	0.02
40-49	50 (45.5)	12 (10.9)	62 (56.4)		
>=50	30 (27.3)	1 (0.9)	31(28.2)		
	95 (86.4)	15 (13.6)	110 (100)		
Years of Experience					
<10	10 (9.1)	4 (3.6)	14 (12.7)	9.518	0.39
10-19	55 (50.0)	7 (6.4)	62 (56.4)		
20-29	20 (18.2)	3 (2.7)	23 (20.9)		
>=30	10 (9.1)	1 (0.9)	11 (10.0)		
Total	95 (86.4)	15 (13.6)	110 (100)		

Out of 110 respondents, almost all (86.4%) had a very good knowledge of general newborn care, which was scientifically significant (p=0.02), out of which (45.5%) were from age range of 40-49 years, 10.9% of this age group and insignificant number of age group <40 and ≥50 had poor knowledge of newborn. Similarly, those with years of experience ranging from 10-19 years had significant knowledge of newborn care, followed by those within the range of 20-29 years of working experience, an insignificant number of respondents with years of experience of <10 and ≥30 had poor knowledge of newborn care. This indicates that the more matured and long practice of skill improves competency (Table 5).

IV. DISCUSSION OF FINDINGS

About three-quarters of all newborn deaths occur during the first week of life with over half of these occurring within the first 24 hours after birth. The first minute is very critical to reducing neonatal mortality[20]. Neonatal mortality rate per 1000 live birth in 2017 according to the UNICEF report of 2018 was 20% with the highest rate of 27% in Sub-Saharan Africa out of which Nigeria had 33% [21].

This study showed poor performance of community health extension workersin neonatal resuscitation. This was seen in their overall knowledge of resuscitation of the newborn. This is similar to studies conducted in

some developing countries, where neonatal resuscitation is a big challenge [16]. This is an indication that this group of health care practitioners did not have a basic resuscitation course in their training institutions.

Also, the study revealed that less than 10% of respondents had attended a training on resuscitation before, unfortunately, less than 3% of them had residual knowledge of it. This is in contrast to the study conducted in Pakistan by Bhutta et al [13], where knowledge of midwives working at Primary Health Carewas found to be insufficient because of their low educational level even though they had pre-service training on neonatal resuscitation. It was discovered from this study that the level of awareness about neonatal resuscitation among community health extension workers was very low, but an overall assessment of the level of knowledge of newborn care was high. This indicates adequate knowledge and skill of maternal and newborn care over the years. This is similar to the findings by Murila et al[16], where only 34.4% of the participants managed to score above the minimum competency level despite years of experience claimed by participants. This indicates a serious deficiency in knowledge of newborn care.

This present study is consistent with the findings of a study conducted in Ethiopia by Berhe et al, to assess knowledge, the practice of newborn care and associated factors among health care providers in public health facilities. It was found that majority (74.65%) of health care providers who participated in the study had adequate knowledge ofnewborn care[22]. It is also similar to findings in the study of Mirkuzie et al, in their study on current evidence on emergency obstetric and newborn care services in Addis Ababa Ethiopia. It was revealed that over half 68% of respondents had knowledge of newborn care[23] but contrary to the study conducted in Khartoum in 2011 by NasorTaha, where health care providers had poor knowledge regarding care of the newborn at birth and poor practice regarding the immediate care of newborn [24].

Although, few of them claimed to have received training in resuscitation, only 2.7% could accurately describe neonatal resuscitation. This is in contrast to the findings of Ogunlesi et al [25] in their study of knowledge of nurses on neonatal resuscitation in Western Nigeria were nurses who had received training in resuscitation in the last 5 years still had adequate knowledge of evaluation and appropriate decision. It is similar to the study conducted in Kenya by Murila et al [16] where health care personnel had an overall poor performance on neonatal resuscitation. The index study revealed overall poor basic knowledge. This is in contrast to the study conducted in Ghana where knowledge of health care providers especially doctors was good before training compared to nurses and, similar to the study of Uwaka&Merritt 2016 [26] in their study in rural Nigeria, where it was shown that knowledge of neonatal resuscitation was poor among birth attendants who participated in the study. This was also seen in the study of Bhutta et al [13] conducted in Pakistan, where health workers in rural Pakistan had poor performance score in neonatal resuscitation before the intervention. In a study conducted by Peace Corp in Magadasgar by Close et al [27], it was found out that training rural healthcare workers in newborn resuscitation using the HBB algorithm results in improvements in personal and organizational practice. Similar to another study conducted in Osun state of Nigeria by Adebami et al [28], it was found outthat there was poor knowledge of proper practice of neonatal resuscitation at the primary and secondary health care levels.

In conclusion, the performance of community health workers in this essential skill is unacceptable because of their involvement in the direct care of mothers and newborns, therefore, they should be provided with appropriate knowledge and skills in neonatal resuscitation. And this calls for urgent need to train them adequately to ensure the satisfactory neonatal outcome. This critical need will expand their knowledge and skills to reduce the neonatal mortality rate.

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