EVALUATION OF NURSES/MIDWIVES' KNOWLEDGE AND SKILLS RETENTIONRETENTION ON NEONATAL RESUSCITATION, IN OBIO COTTAGE HOSPITAL

ABSTRACT

The study is aimed at evaluating Nurses'/Midwives' knowledge and skills retention on Neonatal resuscitation in Obio-Cottage Hospital Port Harcourt**.** A QUASI-Experimental Research Study was adopted for the study. The population for the study consist of nurses/midwives and volunteers currently working with Obio-Cottage Hospital Port Harcourt Rivers State. At~~s~~ the time of this study, A total of 175 nurses/midwives and volunteers ~~are~~ were working with the health facility. A validated self-structured instrument was adopted for data collection. Statistical Package for Social Science version 22.0 was used to analyse the data. Descriptive statistics were used as the data analysis method. Hence, a measure of central tendency statistics (mean), simple percentages and charts were used to answer the research questions while ~~a~~ t~~est~~-test statistical tool was used to test the null hypothesis 0.05 level of significance. The study revealed that 20.9%, 52.2% and 26.9% were of the respondents were between ages 25-34, 35-44 and 45 and above years respectively. ~~of age, followed by 52.2% in the age bracket of 35-44 years of age. While 26.9% were in the age bracket of 45 and above years of age. Findings also showed~~On the educational qualifications, 61.2% of the respondents had RN/RM ~~; while~~and 7.5% had BNSc. The study evaluated nurses'/midwives' knowledge and skills retention in Neonatal resuscitation at Obio-Cottage Hospital Port Harcourt**.** A pre-post single-group research design was used, and purposive sampling selected 175 nurses/midwives. A validated self-structured instrument was adopted for data collection. Results were presented using descriptive and inferential statistics. The mean score of knowledge at baseline was 1.63343±SD=2.13428 and Mean=7.6286±SD=1.89199 at P1-Post-intervention. Also, the mean score of the skill retention of nurse-midwives at baseline was Mean=1.47 ± SD=1.129 and Mean=3.74 ±SD=1.050 at P1-Post-intervention. There was a significant difference in the knowledge mean scores, t=22.429, p = 0.00 at P0 and P1, and in the skill mean scores, t=18.784 0 p = 0.00 at P0 and P1. The study concluded that nurses'/Midwives' knowledge and skills retention in Neonatal resuscitation in Obio-Cottage Hospital Port Harcourt were low. Therefore, the study recommends that time should be allotted for nurse midwives to attend seminars and training to improve their performance in new-born resuscitation.

Keywords: Midwive, Knowledge, Skills, Retention, Neonatal, Resuscitation

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It should also be summarised to bring out the salient points/ findings.

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1.0 Introduction

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Neonatal resuscitation is a series of steps performed at the time of birth to help the new-born breathe. In many cases, neonatal resuscitation is a primary requirement for life, especially for neonates with birth asphyxia (Msemo *et al.*, 2016). Neonatal resuscitation is particularly important as the first 28 days following birth are deemed the most vulnerable. Good neonatal

resuscitation skills may fail to develop especially when the acquired knowledge ~~lacks~~ is not put into practice.

The World Health Organization (WHO) estimated that globally, about 2.5 million new-borns die during their first twenty-eight days of life each year (Hug, David and Danzhe, 2017). The day of birth is the riskiest when nearly half of the new-born deaths occur. The majority of these new-born deaths are preventable and occur in developing countries (GBD, 2015). Nigeria has the second-highest number of neonatal deaths in the world and the highest in Africa (Sankar, *et al.,* 2016). About 7 million babies are born annually in Nigeria, of which 240,000 die in the first 28 days of life. Neonatal mortality contributes 32% of the overall annual under- five deaths and 80% of these deaths are caused by complications related to prematurity, birth asphyxia and infection, most of which are preventable. Under-five mortality has increased from 128 deaths per 1000 live births in 2013 to 132 deaths per 1000 live births in 2018 (NDHS) as a result of neonatal mortality of 38 per 1000 live births (Most Current National Guideline for New born care lunched in January 2023).

In 2017, the neonatal mortality rate (NMR) in Nigeria was 36.6/1000 and has remained high, despite a decrease in other sub-Saharan African countries (Omoigberale, Sadoh and Nwaneri, 2015). The major contributors to the high NMR include prematurity, birth asphyxia and sepsis (Onyiriuka, 2016). Globally, birth asphyxia alone contributes to 24% of all neonatal deaths, while in Nigeria, it accounts for 31% of neonatal deaths (WHO and MCEE, 2017). Preterm birth is the leading cause of death in new-borns less than 28 days old with more than a million preterm infants dying each year. Those who survive risk a range of disabilities throughout their lives. Alarmingly, in almost all countries with reliable data, preterm birth rates are increasing (Msemo *et al.,* 2016).

To improve the health outcomes for these new-born babies, the WHO in 2022, issued updates for two interventions. One set of recommendations focuses on the use of antenatal corticosteroids. These drugs cross the placenta and enhance the structural maturity of the foetus' developing lungs, helping to prevent respiratory-related morbidity and mortality in preterm new-borns (WHO, 2022). A review of literature in 2022, recommended in favour of nifedipine which is for preterm labour and maintenance of tocolytic therapy for women with a high likelihood of preterm birth when certain conditions are met.

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What is the second recommendation?

In many cases, neonatal resuscitation is a primary requirement for life, especially for neonates with birth asphyxia (Msemo *et al.,* 2016). Neonatal resuscitation is particularly important as the first few days following birth are deemed the most vulnerable (Arlington *et al.,* 2017). A 2016 United Nations report showed that there are 7,000 neonatal deaths worldwide each day, with the majority (1 million) dying on their first day of life (Arlington *et al.,* 2017). Neonatal resuscitation, which is a series of steps performed at the time of birth is to help the new-born breathe; it is a simple, low-cost intervention that has been shown to significantly reduce neonatal mortality from birth asphyxia by 20 - 30% (Deorari, Paul, Singh and Vidyasagar, 2018). The American Academy of Paediatrics (AAP) with its global partners developed neonatal resuscitation programs such as the Neonatal Resuscitation Program (NRP) and Helping Babies Breathe (HBB) which offer standardized training to improve the knowledge and skills retention of new-born resuscitation among health care workers (HCWs) (Wall *et al.,* 2019). In sub-Saharan Africa, where over two-thirds of the world´s neonatal deaths occur, resuscitation is often not available for the majority of new-borns and also when deliveries occur at home or primary healthcare facilities. In these situations, birth attendants who are poorly skilled in neonatal resuscitation may perform practices that delay effective ventilation (Adebami *et al.,* 2017).

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To reduce the neonatal mortality rate, Nigeria has incorporated neonatal resuscitation as one of the new-born interventions in the integrated maternal, new-born and child health strategies which ought to be practised at all levels of healthcare delivery (Onyiriuka, 2015). The Primary Health Centres (PHC) in Nigeria are run by Skilled Birth Attendants (SBAs) and offer health services including emergency obstetric and new-born care to a diverse group of pregnant women (Das *et al.,* 2018). A proportion of these pregnant women had unsupervised antenatal care, delivered at home or in orthodox centres (Khalid *et al.,* 2015). Some of these cases are sometimes verbally sent to health centres after obstetric complications have arisen (Mildenberger, Ellis and Lee, 2017). The competence of SBAs in neonatal resuscitation is therefore crucial and has gained importance as a key component in decreasing neonatal mortality (Waisu *et al.,* 2018). Therefore, to ensure high coverage in resource-limited settings, the training of SBAs in neonatal resuscitation merits priority (Davis and Dawson, 2018). Studies from West Africa, like Ghana and Sierra Leone, revealed that neonatal resuscitation training is being organized among HCWs. However, significant improvement in immediate post-training knowledge and skills was noted but retention after training was rarely documented.

Good neonatal resuscitation skills may fail to develop especially when the acquired knowledge ~~lacks~~ is not put into practice. Lack of practice is associated with in-adequate essential neonatal resuscitative equipment (Lassina *et al.,* 2017). New-born resuscitation success depends upon the knowledge and skills of birth attendants, in addition to the availability of basic equipment and materials. These include towels or blankets for drying, a bag and mask resuscitator and a suction device (Shikuku, *et al.,* 2017). Annual evaluation of the provision of health services in Africa and Asia has established that trained health workers, equipment and materials for new-born resuscitation are not consistently available in all facilities (Mersha *et al.,* 2019).

Midwives' skills regarding Neonatal Resuscitation are very important to ensure good and immediate neonatal outcomes (Shikuku, *et al.,* 2017). Studies have shown that 10% of neonates require some assistance to begin breathing at birth and only one per cent would require full resuscitation (Lawn *et al.,* 2015). It has been further established that the majority of early neonatal deaths are avoidable (Koum *et al.,* 2015). For a successful resuscitation to occur in a delivery room, a midwife and her team must have proper planning and preparations as well as outline the steps to be taken during resuscitation. These include; initial stabilization that is; drying the baby, keeping it warm, positioning, assessing the airway, and stimulating it to breathe. This is followed by ventilation which includes bag and mask ventilation initially on room air, then chest compressions coordinated with ventilation. Also one breathe to three compressions of the chest (1:3) and lastly, the use of medications and fluid volume expanders (Newell *et al.,* 2018). This highlights the need for continuous evaluation of nurses' and midwives' knowledge and skills regarding neonatal resuscitation to maintain standards where necessary.

1.1 Aim and Objectives of the Study

The study is aimed at Evaluating Nurses'/Midwives' knowledge and skills retention on Neonatal resuscitation in Obio-Cottage Hospital Port Harcourt.

The objectives are to;

1. ~~Assess the knowledge of retention level of nurses/midwives on basic neonatal resuscitation at birth in Obio-Cottage Hospital, Port Harcourt, Rivers State.~~
2. Ascertain the level of nurses'/midwives' skills retention in Neonatal Resuscitation at Obio-Cottage Hospital, Rumuobiakani, Port Harcourt, Rivers State.
3. ~~2.~~Assess the knowledge of retention level of nurses/midwives on basic neonatal resuscitation at birth in Obio-Cottage Hospital, Port Harcourt, Rivers State.

~~3.~~

1.2 Hypothesis

The following hypotheses were tested in this study;

H_{o1}: there is no significant association between the knowledge level of nurses/midwives and neonatal resuscitation at birth in Obio-Cottage Hospital, Port Harcourt, Rivers State.

H_{o2}: there is no significant association between the level of Skills of nurses/midwives and Neonatal Resuscitation at Obio-Cottage Hospital, Port Harcourt, Rivers State.

2.0 METHODOLOGY

The pre-post single-group research design was used in this study. The population of the study consist of nurses/midwives currently working with Obio-Cottage Hospital Rumuobiakani Port Harcourt Rivers State. At the time of this study, a total of 175 nurses/midwives wea~~a~~re working with the health facility. A sample size of 175 nurses/midwives was used for the study. This number is 100% of the population of nurses/midwives in the hospital; all the nurses/midwives participated in the study. The instrument for data collection was a self-structured questionnaire developed by the researcher. Descriptive statistics were used to analyse the data. Hence, the measure of central tendency statistics (mean), simple percentages and charts were used to ~~answer~~ analyse the research questions while t-test statistics was used to test the null hypothesis at 0.05 level of significance.

3.0 RESULTS

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Socio-demographic Characteristics

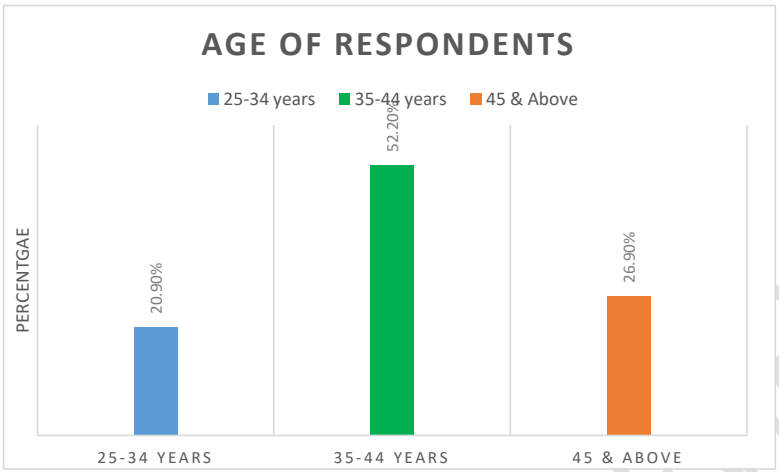

Fig. 1: Age of Respondents

Figure 1 shows that (20.9%) of the respondent were between 25-34 years of age, followed by (52.2%) in the age bracket of 35-44 years of age. (26.9%) were in the age bracket of 45 and above years of age.

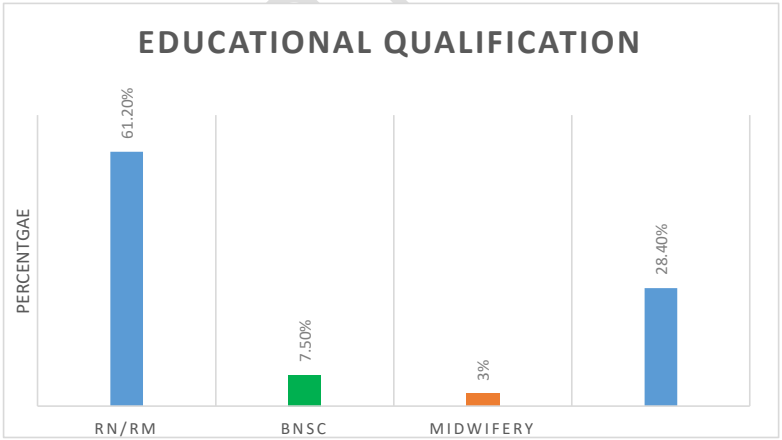

Fig. 2: Educational Background of Respondents

Fig. 2 shows the educational qualification of the respondents (61.2%) of the respondents were RN/RM; while (7.5%) have BNSc. The least was B.Sc. Midwifery with (3.0%) respondents and respondents with other qualifications (RPHNO) were (28.4%).

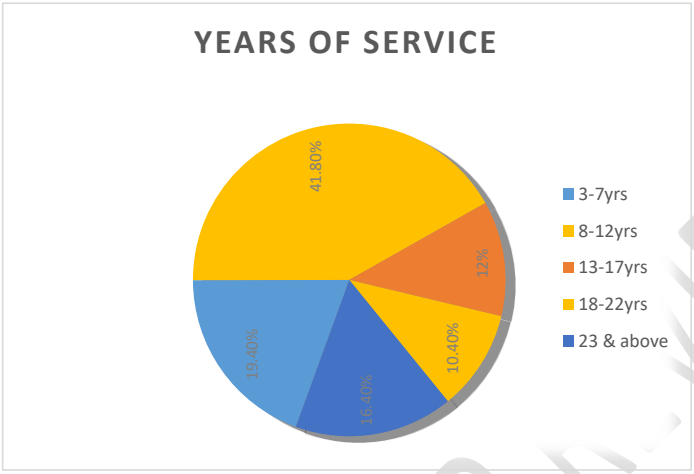

Fig. 3: Years of Service of Respondents

Fig, 3 shows the distribution of years of experience of the respondents. 13 (19.4%) of the respondents had 3-7 years of experience, (41.8%) were within 8-12 years of experience, followed by (11.9%) of respondents within the bracket of 13-17 years, also 7(10.4%) had 18-22 years while (16.4%) were within 23 years and above years of experience.

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Research Question 1: What is the level of knowledge of nurses/midwives on basic neonatal resuscitation at birth in Obio-Cottage Hospital, Port Harcourt, Rivers State?

Table 1. Frequency and Percentage Distribution of respondents on basic neonatal resuscitation at birth before and after the intervention.

Neonatal Resuscitation at Birth	Level of knowledge		Level of skills and equipment	
	Baseline (P0)	Intervention (P1)	Baseline (P0)	Intervention (P1)

	F	%	F	%	F	%	F	%
Less	155	88.6	26	14.9	144	82.3	17	9.7
High	20	11.4	149	85.1	31	17.7	158	90.3
Total	175	100.0	175	100.0	175	100.0	175	100.0
Mean	1.6343		7.6286		1.47		3.74	
Main Gain (P1-P0)	5.9943				2.27			
Maximum	7		11		4		6	
Minimum	0		4		0		1	
Range	7				4			

The frequency distribution of nurses' and midwives' knowledge and proficiency in neonatal resuscitation at Obio-Cottage Hospital is shown in the table above. The baseline (P0) and Intervention (P1) for both the level of knowledge and the level of skills and equipment are shown as four columns in the data. The number of participants in each category is shown in the frequency column, and the proportion of participants in each category is shown in the percentage column. According to the table, only 11.4% of nurses and midwives had excellent knowledge of newborn resuscitation at baseline (P0), while a higher percentage of 88.6% had low knowledge. However, after the intervention (P1) knowledge of respondents, as regards newborn resuscitation, increased to 85.1% leaving only 14.9% with low knowledge.

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The study also investigated the skill level of nurses and midwives as regards newborn resuscitation, the result showed that only 17.7% of the nurses and midwives had high skills on equipment at baseline (P0), while 82.3% are not skilful in newborn resuscitation. As found after we trained the nurses and midwives, the skills of staff had increased to 90.3% while only 9.7% had lower skills in newborn resuscitation equipment. The knowledge means to

score and the skills of equipment means scores are shown in the mean column (P0 and P1). The primary gain column displays the variation between the baseline and the level of knowledge, skills, and equipment at the intervention (P1) (P0). From the table at P0, the mean was low (1.6343) as compared to improved knowledge after intervention with an improved mean score of 7.6286. For equipment skills, the table revealed that people do not have adequate skills in equipment with a low mean value of 1.47 while improvement after intervention was shown in the mean value of 3.74, a value closer to 5 points.

The highest level of observable knowledge, skills, and equipment is represented by the maximum column, while the lowest level is represented by the minimum column. The difference between the maximum and minimum values is shown in the range column. Overall, the table suggests that the intervention was effective in improving the level of knowledge and skills and equipment of nurses/midwives in neonatal resuscitation retention at Obio-Cottage Hospital.

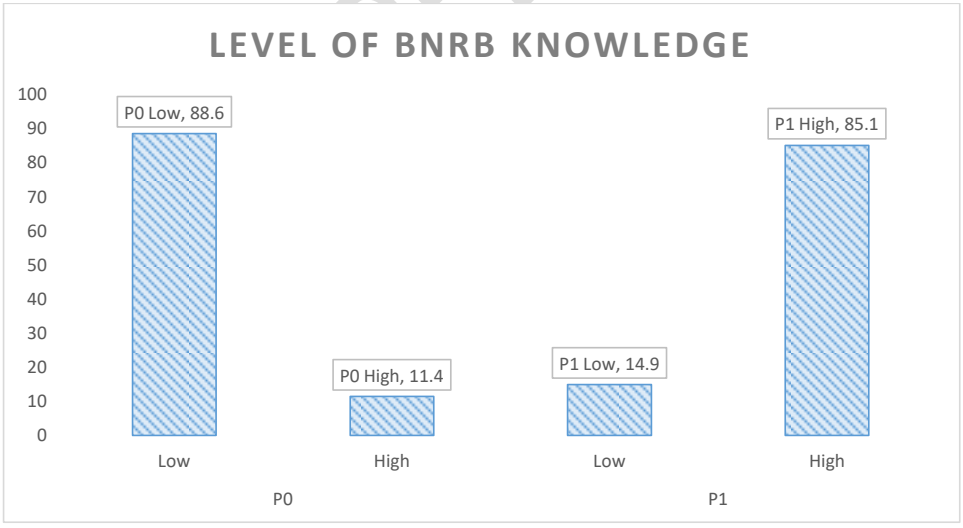

Fig 4. Graphically Presentation of Basic Neonatal Resuscitation at the birth level of Knowledge at Baseline (P0) and Intervention (P1).

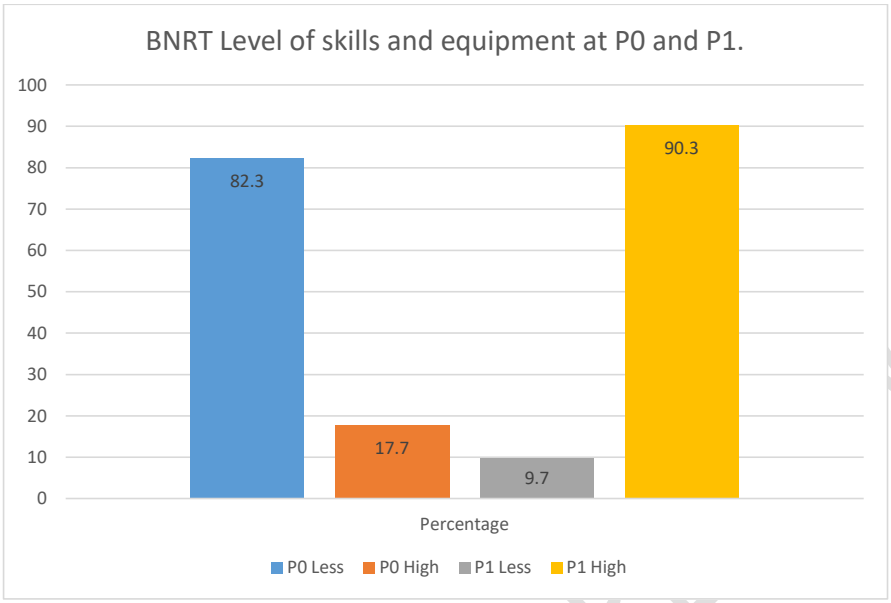

Fig 5. Graphically Presentation of Basic Neonatal Resuscitation at the birth level of Skills and Equipment at Baseline (P0) and Intervention (P1).

Research Question 2: What is the level of Skills of nurses/midwives in Neonatal Resuscitation at Obio-Cottage Hospital, Rumuobiakani, Port Harcourt, Rivers State?

Table 2. Knowledge Mean Scores of basic neonatal resuscitation at birth measurement at Baseline (P0) and Intervention (P1).

Variables Overall Mean Scores	**Baseline (P0) Mean=1.63343±SD=2.13428**		**Intervention (P1) Mean=7.6286±SD=1.89199**	
	Mean	**Std. Deviation**	**Mean**	**Std. Deviation**
How does a newborn respond to an interruption in normal transition?	0.15	.357	0.54586	.49906
What per cent of newborns require an initial assessment to determine whether resuscitation is required?	.00	.000	0.7200	.45029
What is the most important and effective action in a neonate requiring resuscitation?	0.30	.458	0.7299	.44530
Which of the following is a characteristic of primary apnea but not of secondary apnea?	0.15	.357	0.5314	.50044
What are the "ABCs of resuscitation"?	0.15	.357	0.6667	.47276
Evaluation and decision-making during resuscitation are primarily based on which combination of signs?	0.15	.357	0.8629	.34499
Newborns who experience secondary apnea usually respond with an increase in heart rate to which of the following?	0.15	.357	0.5200	.50103
At the time of birth, which 3 questions should you ask about the newborn while you are assessing the need for resuscitation?	0.15	.357	0.5886	.49350
Which of the following is NOT a major change that normally occurs at birth allowing a baby to get oxygen into the lungs?	0.15	.357	0.8514	.35669
Which of the following best describes the initial steps of neonatal resuscitation?	0.30	.458	0.8343	.37289
Which of the following is true about the resuscitation process?	0.00	.000	0.7829	.41348

Table 3. Average scores and ranges for nurses' and midwives' knowledge of retention in newborn resuscitation at Obio-Cottage Hospital

S/N	Items	N	Min.	Max.	Mean	Std. Deviation
1	If the baby is not breathing, is apnoeic or has gasping respirations or a heart rate is less than 100 b/min, start ventilation with a bag and mask.	175	2.00	4.00	2.9	.35
2	Check and recheck the newborn's neck if it is slightly extended.	175	1.00	4.00	2.5	.92
3	If the chest is not rising, continue suctioning the mouth, nose and remove mucus or blood from the airway.	175	1.00	4.00	1.8	.66
4	Select the appropriate mask size to cover the chin, mouth and nose and check that the mask is properly sealed over the newborn's nose and mouth.	175	1.00	4.00	1.9	.75
5	Once the seal is assured and chest movement is present ventilate the newborn and maintain the correct rate (40 breaths per minute).	175	1.00	4.00	2.7	.64
6	If there is severe indrawing of the chest, ventilate with oxygen if available.	175	1.00	4.00	1.7	.69
7	If the newborn is not breathing regularly after 20 minutes of ventilation incubate and transfer the baby for appropriate care for a sick newborn.	175	1.00	4.00	2.1	.20
8	the baby should be closely observed when the baby starts spontaneous breathing before deciding to do routine essential care.	175	1.00	4.00	2.4	.07
9	After ventilating for 1 minute, stop and quickly assess if a newborn is having spontaneous breathing.	175	1.00	4.00	2.5	1.5
	Total				**2.277**	**0.642**

The table showed the average scores and ranges for nurses' and midwives' knowledge of retention in newborn resuscitation at Obio-Cottage Hospital. For each of the 11 variables about neonatal resuscitation, the data is provided in two columns: Baseline (P0) and Intervention (P1). The knowledge scores for nurses and midwives on each variable or topic were averaged out in the mean score column, with scores ranging from 0 to 1. The stronger the nurses' and midwives' understanding of the particular variable, the higher the mean score. The degree of variance or dispersion in the nurses' and midwives' knowledge scores for each

variable is shown in the standard deviation column. The table reveals that the total mean score of nurses' and midwives' knowledge of newborn resuscitation was low at the baseline (P0) level (mean=1.63343). However, after the intervention (P1), the overall mean score improved significantly (mean=7.6286).

Examining the individual variables, it could be seen that following the intervention, the mean scores of nurses' and midwives' knowledge increased in comparison to the baseline. The question "Assessment and decision-making during resuscitation are mostly based on which combination of signs?" showed the greatest improvement, with a mean score of 0.8629 at intervention (P1), showing that the nurses and midwives understood the question well.

The mean score for the question, "What percentage of babies require a first assessment to decide whether resuscitation is required?" was 0.00 at baseline (P0), indicating that none of the nurses or midwives understood the issue correctly. However, after the intervention, the mean score improved significantly to 0.72, indicating that the nurses/midwives better understood the question.

In conclusion, the table indicated that the intervention was successful in enhancing nurses' and midwives' knowledge of neonatal resuscitation retention at Obio-Cottage Hospital as seen by the significantly higher mean scores for all categories.

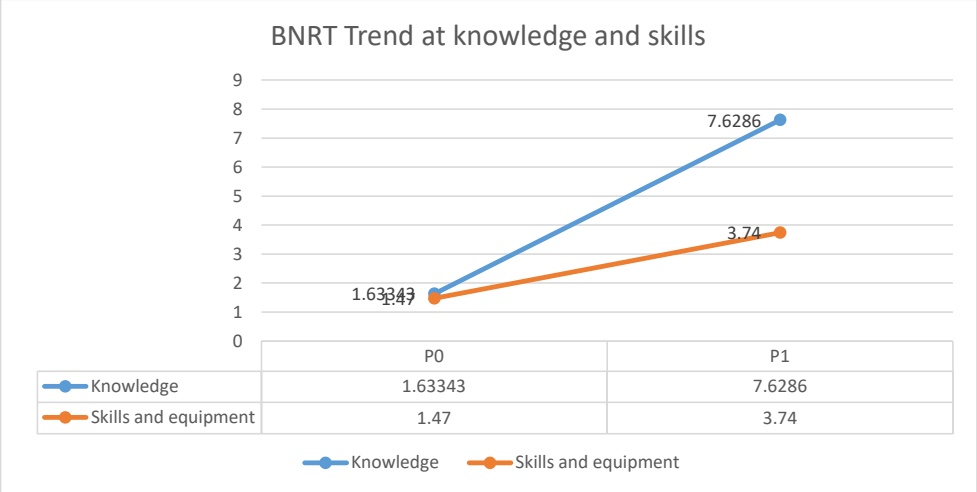

Fig 6. Graphically Presentation of mean scores level of knowledge and skills at Baseline (P0) and Intervention (P1)

Hypothesis One

H0: There is no significant difference between the knowledge level of nurses/midwives on basic neonatal resuscitation at birth before and after the intervention.

H1: There is a significant difference between the knowledge level of nurses/midwives on basic neonatal resuscitation at birth before and after the intervention.

Table 4: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Knowledge_P0	1.6343	175	2.13428	.16134
	Knowledge_P1	7.6286	175	1.89199	.14302

Table 5: Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Knowledge_P0 & Knowledge_P1	175	-.541	.000

Table 6: Paired Samples Test

	Paired Differences					t	df	P-value
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Knowledge_P0 – Knowledge_P1	-5.99429	3.53553	.26726	-6.52178	-5.46680	-22.429	174	.000

The tables showed the findings of a study conducted to see how an intervention affected nurses' and midwives' knowledge of fundamental newborn resuscitation during birth. The respondents' knowledge levels were assessed before and after the intervention, and the study compared the outcomes using paired sample statistics. The knowledge scores before (Knowledge P0) and after (Knowledge P1) the interventions are shown in Table 4 together with their respective means, standard deviations, and standard error means. After the intervention, the mean score increased to 7.6286 with a standard deviation of 1.89199 from the mean score before the intervention of 1.6343 with a standard deviation of 2.13428. For the two groups, the standard errors of the means were 0.16134 and 0.14302, respectively.

The knowledge scores before and after the intervention had a -0.541 correlation, as shown in Table 5. While the score before the intervention rose, the score after the intervention fell, according to the correlation coefficient, which indicated a moderately negative correlation between the two groups. The paired samples' t-test findings for the difference between the knowledge scores before and during the intervention are shown in Table 6. The standard deviation was 3.53553, the standard error of the mean was 0.26726, and the mean score difference was -5.99429 overall. The scores' differences were within a 95% confidence interval of -6.52178 to -5.46680. The t-value, which indicated the statistical significance of

the difference between the scores, was -22.429, with 174 degrees of freedom and a p-value of 0.000.

In conclusion, the results suggested that the intervention had a significant impact on the knowledge level of nurses/midwives on basic neonatal resuscitation at birth, as evidenced by the significant improvement in the knowledge scores after the intervention.

H0: There is no significant difference in the skills and equipment level of nurses/ midwives on basic neonatal resuscitation at birth before and after the intervention.
H1: There is a significant difference in the skills and equipment level of nurses/ midwives on basic neonatal resuscitation at birth before and after the intervention.

Table 7: Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Skill_P0	1.47	175	1.129	.085
	Skill_P1	3.74	175	1.050	.079

Table 8: Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Skill_P0 & skill_P1	175	-.069	.366

Table 9: Paired Samples Test

		Paired Differences					t	df	P-value
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Skill_P0 - Skill_P1	-2.263	1.594	.120	-2.501	-2.025	-18.784	174	.000

The tables showed the findings to assess the effects of an intervention on the skills and equipment of nurses and midwives regarding fundamental neonatal resuscitation at birth. The respondents' skills and equipment levels were assessed before and after the intervention, and the results were compared using paired sample statistics. The skills scores before (Skill P0) and after (Skill P1) the intervention were shown in Table 7 together with their means, standard deviations, and standard error means. Before the intervention, the mean skill score was 1.47, with a 1.129 standard deviation; after the intervention, the mean skill score was 3.74, with a 1.050 standard deviation. The two groups' standard errors of the means were 0.085 and 0.079, respectively.

The correlation between the skill scores before and during the intervention is shown in Table 8, and it was -0.069. According to the correlation coefficient, there was no discernible association between the two groups. The paired samples' t-test findings for the difference between the skill scores before and during the intervention are shown in Table 9. The standard deviation was 1.594, the standard error of the mean was 0.120, and the mean score difference was -2.263. The scores' difference was within a 95% confidence interval of 2.501 to -2.025. The statistical significance of the difference in the scores was shown by the t-value, which was -18.784 with 174 degrees of freedom and a p-value of 0.000.

According to the findings, the intervention considerably influenced the nurses' and midwives' knowledge of basic newborn resuscitation at birth, as shown by the large increase in skill scores following the intervention. According to Table 8's correlation coefficient, there was no discernible relationship between the skill scores before and after the intervention. Nonetheless, the findings of the paired samples t-test in Table 9 showed that there was a statistically significant difference between the skill scores before and after the intervention.

DISCUSSION

~~**Level of Knowledge Retention of Midwives on Neonatal Resuscitation**~~

Comment [MS11]: Reasons for observed similarities/ differences with other studies not stated.

The results from this study were quite worrisome because it suggested that midwives were generally not knowledgeable about neonatal resuscitation, this finding is consistent with the finding of Gebreegziabher *et al.,* (2014), who studied knowledge and skills of neonatal resuscitation of health professionals at the University Teaching Hospital of Northwest Ethiopia and reported low levels of knowledge among midwives. It also affirmed the findings of Murila *et al.,* (2012) who reported very poor performance among health workers in Kenya (including nurses and midwives) after assessing their knowledge of neonatal resuscitation.

The finding is however contrary to the findings from a study in Afghanistan that assessed knowledge of neonatal resuscitation among doctors and midwives and reported high levels of knowledge among midwives (Kim *et al.,* 2013). It also contradicted findings from a study in Western Nigeria which assessed knowledge of neonatal resuscitation among nurses, participants' demonstrated adequate knowledge of neonatal resuscitation (Ogunlesi, *et al.,* 2008). The participants in this study also demonstrated insufficient knowledge on the evaluation or assessment of babies at birth, and the appropriate interventions to carry out for babies who need resuscitation. Once again, this finding was contrary to that of (Ogunlesi, *et al.,* 2008), who reported that participants in their study had adequate knowledge in the evaluation of babies at birth. However, the two studies confirmed in terms of the findings on knowledge about appropriate interventions to carry out after evaluation, with participants in both studies demonstrating inadequate knowledge in this area~~. However, the two studies confirmed in terms of the findings on knowledge about appropriate interventions to carry out after evaluation, with participants in both studies demonstrating inadequate knowledge in this area.~~

~~**Level of Skills Retension of Nurses/midwives in Neonatal Resuscitation**~~

The findings of this study revealed that the level of Skills of nurses/midwives in Neonatal Resuscitation at Obio-Cottage Hospital, Rumuobiakani, Port Harcourt, Rivers State was low. The findings were following several other studies that also discovered nurses/midwives' low level of Skills in Neonatal Resuscitation. Good NBR practices among nurses and midwives have however been reported by Kim et al (2013) in Afghanistan and Ogunlesi *et al.,* (2008) in Western Nigeria. As earlier mentioned, the participants in these two studies had received in-service training on newborn resuscitation. In Afghanistan, it was to improve the capacity of midwives in maternal and newborn health, there's an ongoing motive to significantly invest in quality education and graduation of competent professional midwives thus providing them with the skills required to practice. For these reasons, the midwives in Afghanistan were most likely to be more skilled as compared to those in Somalia. A report showed that to date, over 3,000 Afghan midwives have been trained (Todd *et al.,* 2012).

Comment [MS12]: No need for subheadings in discussion

Conclusion

This research has highlighted the level of knowledge and skills Retention of nurse-midwives delivering neonatal resuscitation. This study demonstrated that the level of knowledge and skills of midwives-nurses in neonatal resuscitation and retention was low at a (mean = 2.02). This means that more than half of the observed nurses and midwives had inadequate skills in neonatal resuscitation. Nurses and midwives with at least 4 years of work experience, working in units with more births and with at least four colleagues per shift—were more likely to have adequate skills in neonatal resuscitation. Among the nurses and midwives sampled, there were many knowledgeable and skilled birth attendants. It is clear from the findings that midwives generally have inadequate knowledge about neonatal resuscitation. In addition, many midwives did not have sufficient experience in neonatal resuscitation,

Comment [MS13]: Too lengthy. Please summarise it.

regardless of the number of years they have practised as midwives. Midwifery training at the first-degree level, basic nursing training and work experience before midwifery training, and training midwives in neonatal resuscitation may contribute to enhanced knowledge and skill Retention in neonatal resuscitation since these factors were associated with higher knowledge of neonatal resuscitation.

Recommendations

Comment [MS14]: This should be summarised into 2 broad groups: training/ retraining and regular evaluation/ re-evaluation

Based on the findings of this study, the researcher recommends the following.

1. Time should be allotted for nurse/ midwives to attend seminars and training to improve their performance in newborn resuscitation.
2. Periodic HBB training/refresher courses for nurses and midwives should be encouraged.
3. Time should be allocated for nurse midwives to attend seminars and training to improve their performance in newborn resuscitation.
4. Mentorship and regular cost-effective Neonatal Resuscitation (NR) training with a focus on maintaining the warm chain during newborn resuscitation, and airway maintenance in meconium presence is encouraged.
5. It is therefore highly imperative that government provides opportunities for all midwives to be trained in such an important lifesaving skill.
6. Practicing midwives should mandatorily attend PANCOF NRT, at least once in 2 years to update their knowledge and skills of NR.

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. The researcher is of the view that if emphasis could be placed on the knowledge of midwives in their handling of neonates requiring resuscitation, much could be achieved in reducing neonatal morbidity and mortality rate in the country.

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Implications for Nursing Practice

Comment [MS15]: This should be removed

The findings of this study highlighted a gross skill deficiency, which without appropriate intervention will lead to increased neonatal mortality. Nurses and midwives form the bulk of the healthcare workforce in Nigeria and are directly responsible for maternal delivery and neonatal resuscitation. Their deficiency in neonatal resuscitation skills during the critical period of life for newborn babies is reflected in Nigeria's high neonatal mortality rate. It is therefore imperative that all health facilities provide continuous professional HBB training (at least biannually) to enhance resuscitation skills. Given the high fertility rates in low-income countries such as Nigeria, a corresponding increase in birth rate is expected, which implies the need for planning for a sufficient supply of neonatal resuscitation equipment. Therefore, there is a need for regional- and institution-based supervision to ensure the competence of nurses and midwives in neonatal resuscitation, as well as the availability and functionality of required equipment.

References

Comment [MS16]: Vancouver referencing style should be used for both the intext and bibiliography

Adebami O, Oyedeji O, Joel-Medewase V, Oyedeji G, Fadero F. (2017). Neonatal resuscitation in some Nigerian primary and secondary health institutions: an evaluation of ongoing practices. Niger J Paediatr. 34(1-2): 8-13.

Arlington L, Kairuki AK, Isangula KG, Meda RA, Thomas E, Temu A, Mponzi V, Bishanga D, Msemo G, Azayo M (2017). Implementation of "Helping Babies Breathe": a 3-year experience in Tanzania. *Pediatrics*, 139(5):e20162132.

Das MK, Chaudhary C, Singh Bisht S, Maria A, Jain A, Kaushal SK et al. (2018). Retention of knowledge and skill of birth attendants in newborn care and resuscitation after 1 year in clinical practice: an experience from India. *J Clinical Neonatology*. 7(2): 89-95.

Hug L, David S, Danzhen Y. (2017). Levels and trends in child mortality, report 2017: estimates developed by the UN inter-agency group for child mortality estimation. United Nations Child Fund.1-36.

Khalid N, Ahmad M, Tahir A, Mahmood H, Saleem SS, Saleem SS. (2015). Basic neonatal resuscitation, knowledge assessment at primary health care centers of general Sheikhupura in Pakistan - a cross-sectional study. *J Pak Med Assoc.* 65(9): 990-4.

Khan, S. M., Kim, E. T., Singh, K., Amouzou, A., & Carvajal-Aguirre, L. (2018). Thermal care of newborns: drying and bathing practices in Malawi and Bangladesh. *Journal of Global Health*, *8*(1), 1–10. https://doi.org/10.7189/jogh.08.010901

Kim YM, Ansari N, Kols A, Tappis H, Currie S, Zainullah P, (2013). Assessing the capacity for newborn resuscitation and factors associated with providers' knowledge and skills: a cross-sectional study in Afghanistan. 13(1):1-12.

Lawn, J. E., Blencowe, H., Waiswa, P., Amouzou, A., Mathers, C., Hogan, D., … Frøen, J. F. (2015). Stillbirths : rates , risk factors , and acceleration towards 2030. *The Lancet*, *387*, 587–603. https://doi.org/10.1016/S0140-6736 (15)00837-5

Mildenberger C, Ellis C, Lee K. (2017). Neonatal resuscitation training for midwives in Uganda: strengthening skill and knowledge retention. *Midwifery*. 50: 36-41.

Msemo G, Massawe A, Mmbando D, Rusibamayila N, Manji K, Kidanto HL, Mwizamuholya D, Ringia P, Ersdal HL, Perlman J: Newborn mortality and fresh stillbirth rates in Tanzania after helping babies breathe training. Pediatrics 2013, 131(2):e353-e360.

Onyiriuka A. (2016). Birth asphyxia in a Nigerian mission hospital in Benin City. *Trop J Obstet Gynaecol.* 26 (1): 80-8.

Sankar MJ, Natarajan CK, Das RR, Agarwal R, Chandrasekaran A, Paul VK. (2016). When do newborns die: a systematic review of timing of overall and cause-specific neonatal deaths in developing countries. *J Perinatol. 36 Suppl* 1(Suppl 1): S1-S11.

WHO and Maternal and Child Epidemiology Estimation Group (MCEE) (2017). Child mortality estimates global and regional child deaths by cause. 2017. Accessed on 23rd October 2018.