NEONATAL CARE RESOURCES AND SERVICES BY NURSES IN SELECTED TERTIARY HEALTH INSTITUTIONS IN SOUTH EASTERN NIGERIA

BY

Agu Earnest Emeka[1]

Chiejina Edith Nkechi [2]

Ndie Elkenah Chibuike.[3]

1. Nursing Officer I, Alex Ekwueme Federal University Teaching Hospital, Abakaliki, Ebonyi State, Nigeria.
2. Professor, Department of Nursing Science, Faculty of Health Sciences and Technology, Nnamdi Azikiwe University, Nnewi Campus, Nigeria.
3. Reader, National Open University, Abuja, Nigeria.

Abstract

Neonatal developmental stage is a critical period, and therefore requires adequate uncompromised equipment as well as competent professionals in the care of the newborn. This study focused on neonatal care resources, and services by nurses in tertiary health institutions in South Eastern Nigeria. It was a descriptive cross-sectional research design, Multistage sampling technique was used in selecting 440 respondents. Two research questions and two null hypotheses guided the study. Questionnaires on neonatal care services by nurses in Tertiary health Institutions and checklist on assessment of available and functional equipment, drugs and nursing staff strength in tertiary health institutions were the instruments used for data collection in the study. Standard descriptive statistics of frequency distribution , means and standard deviation (SD) were used to summarize the variables. Mean scores and percentages were used to answer the research questions while Mann-Whitney U and Kruskal Wallis tests were adopted in testing the null hypotheses at 0.05 level of significance. The results revealed availability of essential equipment for neonatal care in the tertiary health institutions as recommended by WHO, and gender of nurses had no significant influence on the quality of neonatal care given by nurses (z score = 0.40; p-value = 0.69). In addition, years of working experience of nurses was found to have significance influence on the quality of neonatal care given by nurses (x^2 =25.63; p-value = 0.00).

Keywords: Functionality, Neonatal Care, Nurses, Resources, Quality of Care.

INTRODUCTION

Neonatal care is the care provided to babies within 28days of age (WHO, 2010). The neonatal units provide expert, round-the-clock care for newborn babies (Douglas, 2010). Care of the neonate is a team work, and neonatal nurses constitute vital part of the neonatal care team and comprise over 90 percent of the neonatal care units staff (American Academy of Pediatrics, 2012). According to Pohl and Rasch (2010), there are two different levels of neonatal care services which are caring for healthy newborns in which the babies typically share a room with their mothers, and both the mothers and their babies are usually discharged from the hospital soon after birth. The other level of neonatal care is the care for at-risk neonates which require special therapy such as use of breathing aid, feeding tubes and they may need longer time before being discharged. Examples of at-risk neonates are premature/ LBW neonates, asphyxiated neonates, jaundiced neonates, neonates with respiratory distress syndrome, atelectasis, neonates with birth injuries, congenitally malformed neonates, and neonatal infections (Selga & Anna, 2007).

Appropriate up- to- date and safe equipment and drugs are needed to be available for neonatal care needs. Neonatal care facilities such as equipment and drugs should be adjacent to labour suites (Bliss, 2012). According to British Association of Perinatal Medicine (2010), Neonatal equipment and drug provision should take into account planned delivery population need and patient flow within the network. In addition, UNICEF (2015) and WHO (2015) recommend among others, the following essential equipment and drugs for newborn care in tertiary level of health care: Phototherapy gadget (**Bililights),** Weighing baby scale, **Blood pressure monitor, Cardiopulmonary monitor, Central line, Endotracheal tube, Incubator, Intravenous line, Radiant warmer, Umbilical catheter,** Electroencephalography (EEG), Electrocardiography (ECG), Intravenous drip monitor (drip alert device), Intravenous sets, Blood sugar testing machine, Apnea monitor, Laryngoscope, Tape (hypoallergic), Thermometer , Cup and spoon , Ictormeter, Drugs for management of sepsis, Drugs for

management of convulsions, Drugs for treatment of breathing problems/ neonatal complications in preterm neonates, Vaccines and Intravenous Fluids.

Neonatal services require appropriately trained, multi-disciplinary professional teams, according to the level of service they provide (America Academy of Pediatrics, 2012). The appropriate nurse/neonate ratio is very important to maintain acceptable standard of care to decrease the mortality rate of neonates and to meet the changing health need of the neonates (Vincent, 2008). International Council of Nurses [ICN] (2008) defined safe staffing as the appropriate number and skill mix of nursing personnel on duty at any one time, which is critical to patient (neonate) outcome. Nursing staffing level in the specific setting like neonatal care units should give due consideration to critical factors like the number of neonates and level of intensity of neonatal needs. Nurse-to- neonate ratio means the maximum number of neonate that may be assigned to a nurse during one shift (Vericourt, 2007).

In Nigeria, Federal Ministry of Health (2009) reported that basic requirements for newborn care such as power supply, water, equipment and drugs are often lacking. Although 24-hour service is available in most tertiary and secondary health facilities, very few primary health centres in the country offer round-the-clock services (Federal Ministry of Health Nigeria, 2009). Care of premature or low birth weight babies is limited to the few tertiary and secondary health facilities that have incubators (Federal Ministry of Health Nigeria, 2009). Improving facility level care of newborns in Nigeria is crucial and is an achievable goal (Federal Ministry of Health Nigeria, 2009). This study was aimed at assessing neonatal care resources, and services by nurses in selected tertiary health institutions in South-Eastern Nigeria.

Research Questions

1. To what extent are the essential equipment for neonatal care available and functional in the selected tertiary health institutions in South-Eastern Nigeria?
2. What are nurses' opinion about the extent of availability of equipment for neonatal care in selected tertiary health institutions in South-Eastern Nigeria?

Hypotheses

1 Gender of nurses has no significant influence on the quality of neonatal care given by nurses in the selected tertiary health institutions in South-Eastern Nigeria.

2 Years of working experience of nurses has no significant influence on neonatal care services given by nurses in the selected tertiary health institutions in South-Eastern Nigeria.

Materials and Methods

Design and Sampling

The research design for the study was a descriptive, cross-sectional design. Multi-stage sampling technique was used for this study. Simple random sampling technique was used to select three States (Anambra, Ebonyi and Enugu) from the five States in South Eastern Nigeria. Purposive sampling technique was used to select two tertiary hospitals from each of the three selected states making it a total of six tertiary hospitals. Proportionate stratified random sampling technique was adopted in selecting the sample from each of the selected hospitals. This was to allow proportional representation of the respondents since the total number of nurses in the neonatal care units of the selected hospitals were not equal. The sample size of this study was determined using Taro Yamane (1967) formula with 95% confidence level. The calculated sample size for the study was 440 respondents.

Instrument

The Instruments used for data collection in the study were questionnaire on Neonatal Care Services by Nurses in Tertiary health Institutions and Checklist on assessment of available and functional equipment, drugs and nursing staff strength in tertiary health Institutions.

The Questionnaire consisted of six (6) sections with 43 categorized question items. Section A consisted of items on demographic characteristics (age, gender, years of experience, rank, professional and educational qualifications). Sections B to F items of the questionnaires were on nurses' opinion on availability of equipment, extent of availability of drugs, staffing of the neonatal units, quality of the neonatal care and attitude of nurses toward neonatal care. The questionnaire was designed in a 4-point scale ranging from 1 to 4 with Always/Strongly agree = 4points, very often/agree = 3points, Fairly/Disagree = 2 points, and rarely/strongly disagree =1 point.

The Checklist contain 51 items which were used to elicit information on available and functional equipment, drugs for neonatal care and nursing staff strength.

The Questionnaire was subjected to reliability test by administering 20 copies to registered nurses working in a Federal Medical Centre that did not form part of the population for the study. Based on Guttmann split-half coefficient reliability test, the result was 0.827.

Method of Data Collection

440 copies of the questionnaire were administered, out of which 438 (99.5%) were returned. Six copies of the checklist were used by the researchers to collect data from the neonatal care units of the six selected tertiary hospitals. Ethical approvals were obtained from the institutions used for the study. Informed consent was also obtained from the respondents. Confidentiality was ensured by not including the names of the health institutions and the respondents in the data collection. Alphabetical codes were used to represent the selected health institutions.

Method of Data Analysis:

Descriptive statistics of frequencies, percentages, mean and standard deviation were used to answer the research questions. Kruskal Wallis test was adopted in testing the null hypotheses at 0.05 level of significance. Mean score of < 2.5 = poor and ≥ 2.5 = good. The analyses were done using Statistical Package for the Social Sciences (SPSS) software (version 20).

Results

Demographic Characteristics of the Respondents

Table 1: Demographic characteristics of the respondents

S/N	Variable	Categories	N	%
1	**Age**	20-30	169	38.6
		31-40	141	32.2
		41-50	95	21.7
		51 and above	33	7.5
2	**Gender**	Male	113	25.8
		Female	325	74.2
3	**Years of Work Experience**	1-5 years	226	51.6
		6-10 years	138	31.5
		11 years and above	74	16.9
4	**Rank**	NO1	59	13.5
		NO11	125	28.5
		SNO	59	13.5
		PNO	108	24.7
		ACNO	68	15.5
		CNO	19	4.3
5	**Professional Qualification**	RN	110	25.1
		RM	105	24
		RN/RM	204	46.6
		Specialty	19	4.3

6	**Educational Qualification**	O Level	1	0.2
		Diploma	322	73.5
		Degree	115	26.3

Total N= 438

Table 1 above shows the demographic distribution of the respondents. It showed that majority were in age bracket of 20-30 years 169(38.6%), followed by those within 31-40 years 141(32.2%). 113(25.5%) were male while 325(74.2%) were female. Majority of the workers had 1-5 years of work experience 226(51.6%) whereas majority had the rank of Nursing Officer 11 125(28.5%). On professional qualification, majority had RN/RM 204(46.6%) while majority of the respondents had diploma as their educational qualification 322(73.5%).

Table 2: Extent of availability and functionality of essential equipment for neonatal care in selected tertiary health institutions in South-Eastern Nigeria

EQUIPMENT	Available Number f(100%)	Functional Number f (%)	Not functional Number f (%)	Not available Number
1. Ambu Bag and mask	30	27 (90.0)	3 (10.0)	0
2. Complete Oxygen apparatus	14	14 (100)	0 (0)	0
3. Electric nasal suction/aspirator	14	9 (63.3)	5 (35.7)	0
4. manual nasal suction machine	9	9 (100)	0 (0)	0
5. Nasal mucus extractor	36	36 (100)	0 (0)	0
6. Pulse oximeter	12	6 (50)	6 (50)	0
7. Continuous positive airway pressure (C-PAP)	5	4 (80)	1 (20)	0
8. Respirator	11	6 (54.5)	5 (45.5)	0
9. incubator	51	43 (84.3)	8(15.7)	0
10. Phototherapy gadget	26	24 (92.3)	2 (7.7)	0
11. Radial warmer	17	9 (52.9)	8 (47.1)	0
12. Baby Weighing scale	23	21 (91.3)	2 (8.7)	0
13. Cup to measure feeds eg breast milk and spoon	81	81 (100)	0 (0)	0
14. Tracheostomy tube	12	12 (100)	0 (0)	0
15. Endotracheal tube	12	12 (100)	0 (0)	0
16. Electro encephalogram	3	3 (100)	0 (0)	0
17. Electro cardiogram	4	4 (100)	0 (0)	0
18. Ictometer	2	2 (100)	0 (0)	0
19. Intravenous drip monitor	0	0	0	0
20. Venepuncture	54	54 (100)	0 (0)	0
21. IV set	32	32 (100)	0 (0)	0
22. Nasogasric tube	40	40 (100)	0 (0)	0
23. Tape (hypoallergic) to fix IV canulae and nasogastric tubes	13	13 (100)	0 (0)	0

24. Thermometer	16	16 (100)	0 (0)	0
25. Blood sugar testing sticks	6	6 (100)	0 (0)	0
26. Apnoea mornitor	1	1 (100)	0 (0)	0
27. Laryngoscope	6	6 (100)	0 (0)	0

Table 2 above shows the number of essential equipment available for neonatal care in selected tertiary health institutions in South-Eastern Nigeria. Some of the equipment such as complete oxygen apparatus, manual nasal suction machine, nasal mucus extractor , cup to measure food, tracheostomy tube, endotracheal tube, electro encephalogram, electro cardiogram, ictometer, venepuncture, iv set, nasogasric tube, tape (hypoallergic) to fix iv canulae and nasogastric tubes, thermometer, blood sugar testing sticks, apnoea mornitor and laryngoscope were 100% functional. Furthermore, 92.3% of phototherapy gadget , 91.3% of baby weighing scale, 90% ambu bag and mask, 84.3% of incubator, 80% of continuous positive airway pressure, 3.3% of electric nasal suction/aspirator, 54.5% of respirator, 52.9% of radial warmer, 50% of pulse oximeter were found functional. Intravenous drip monitor was the only equipment that was not available in all the selected hospitals.

Table 3: Mean score of the nurses' opinion about the extent of availability of equipment for neonatal care in selected tertiary health institutions in South-Eastern Nigeria

		N=438						
S/N	**Nurses opinion on availability of equipment for neonatal care services**	**A**	**VO**	**F**	**R**	**Mean**	**SD**	**Remark**
1	To what extent are the equipment in your neonatal care units available for care of normal neonates?	198	206	29	5	**3.36**	**0.66**	*
2	To what extent are the equipment in your neonatal care units available for care for at risk neonates?	78	188	145	27	**2.72**	**0.83**	*
3	To what extent are the equipment in your neonatal care units available for emergency care for neonates?	62	185	161	30	**2.64**	**0.81**	*
	Grand mean					**2.91**	**0.56**	*

Key: A= Always, VO= Very Often, F=Fairly, R=Rarely, *=Good

Table 3 above shows that the grand mean of the nurses' opinion about the extent of availability of equipment for neonatal care in selected tertiary health institutions in South-Eastern Nigeria was 2.91, SD=0.56 indicating good score. The breakdown were the extent

available equipment in their neonatal care units for care of normal neonates (M=3.36, SD=0.66), the extent the equipment in their neonatal care units are available for care for at risk neonates (M=2.72, SD=0.83), and the extent the equipment in their neonatal care units available for emergency care for neonates (M=2.64, SD=0.81).

Test of Hypotheses

Hypotheses 1: Gender of nurses has no significant influence on the quality of neonatal care given by nurses in selected tertiary health institutions in South-Eastern Nigeria.

Table 4: Mann Whitney U test of gender influence on the quality of neonatal care given by nurses in selected tertiary health institutions in South-Eastern Nigeria

Gender	N	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p-value
Male	113	215.44	24345.00	17904.00	-0.40	0.69
Female	325	220.91	71796.00			
Total	438					

Dependent variable = Quality of neonatal care

Table 4 above shows Mann Whitney U test of gender influence on the quality of neonatal care given by nurses in selected tertiary health institutions in South-Eastern Nigeria. The result showed that the male had a mean rank of 215.44 while the female had a mean rank of 220.91. Z score of -0.40 with p-value of 0.69. This result showed that gender of nurses has no significant influence on the quality of neonatal care given by nurses. The null hypothesis is retained at 0.05 level of significance.

Hypothesis 2: Years of working experience of nurses has no significant influence on the quality of neonatal care services given by nurses in selected tertiary health institutions in South-Eastern Nigeria.

Table 5: Kruskal Walis test of influence of years of work experience of nurses on the quality of neonatal care services given by nurses in selected tertiary health institutions in South-Eastern Nigeria.

Years of Work Experience	N	Mean Rank	X^2	Df	Asymp. Sig.
1-5 years	226	190.22			
6-10 years	138	246.25	25.63	2	0.00
11 years and above	74	259.04			
Total	438				

Dependent variable = Quality of neonatal care

Table 5 above shows that 1-5years working experience had a mean rank of 190.22, 6-10years had 246.25 while 11 years and above had a mean rank of 259.04. The result of Kruskal Wallis test showed that Years of working experience of nurses has a significant influence on the quality of neonatal care services given by nurses (X^2=25.63, df=2, p-value = 0.00). The null hypothesis was rejected at 0.05 level of significance.

Discussion

Demographic Data

Table 1 revealed that the number female nurses (74.2%) were greater than the male nurses (25.8%). In the opinion of the researchers, this is not surprising because nursing profession is often regarded as female profession. Hence, the need to encourage men to study nursing is of upmost importance.

Findings from this study also revealed that 4.3% of the respondents had specialty in neonatal nursing (Table 1). Neonatal nursing care requires specialized knowledge and skills to provide effective and efficient care to the newborns. Evidence is emerging that chances of survival of

the smallest and most preterm infants relate not only to nurse staffing ratios and facilities available for care, but also to the specialist levels of professional education and experience of the nurse delivering the care (Hamilton, Redshew & Tarnow-Mordi, 2007). The implication is that nurses and midwives ready to provide neonatal care services should undertake induction programme which relate specifically to the fundamental care of neonates and their families within neonatal care services. It is also important that all nurses involved in direct clinical care of neonates should undertake newborn life support course appropriate for their role.

Also noted, was that 26.3% of the respondents had degree qualification (table 1). This result is poor. Clinical nurses should be encouraged to further their education so that they can be at par with other members of the health team, contribute meaningfully when decisions are made with regard to clinical practice and be informed with the current trends in clinical practice. Victor and Person (2014) and Dorsten-Brooks (2013) emphasised the importance of nurses education in promoting and facilitating neonatal care.

Extent of availability of equipment for neonatal care services

Findings from the study revealed that 100% of complete oxygen apparatus, 92.3% of phototherapy gadgets, 90% ambu bag and mask, 84.3% of incubator, 80% of continuous positive airway pressure, 3.3% of electric nasal suction/aspirator, 54.5% of respirator, 52.9% of radial warmer, 50% of pulse oximeter were found functional (table 2). This finding is in line with WHO (2015) and UNICEF (2015) recommendation on essential equipment that should be available for neonatal care at the tertiary level of health care services. However, a population-based surveillance survey done in Brong Ahafo Region, Ghana by Linda, et al (2013) revealed that the facilities had adequate infrastructure, but lacked some essential equipment (including incubators, ambu bag and masks). Also a qualitative study of five rural district hospitals in the highlands provinces of Papua New Guinea undertaken by Martin, et

al. (2014) noted that basic equipment for the care of sick neonates was often absent or incomplete.

It should be noted that availability of essential equipment play a major role in delivering quality neonatal health care related services. Atasay and Arsan (2005) documented that when organizing neonatal care services in a country or a region, priorities should be decided by looking at neonatal and perinatal mortality rate and its causes, and that attention should be paid more on the care provided for the neonate and the availability of functional equipment so as to render the required care for the neonate.

Nurses' opinion on the extent of availability of equipment for neonatal care services

The study revealed that nurses' opinion about availability of equipment for neonatal care in the tertiary health institutions was good (Mean = 2.91, SD=0.56) (Table 3). Availability of equipment will promote and enhance the care provided by nurses to the neonates by reducing the stay of the neonates in the hospital as well as complications to the neonates. Bliss (2012) documented that appropriate up-to-date and safe equipment is needed to be available for neonatal care needs. Therefore, the need to sustain the availability and functionality of equipment is imperative in providing quality care to the neonates.

Hypotheses

Findings from the study indicated that gender of nurses had no significant influence on the quality of neonatal care given by nurses [Z-score= -0.40, p-value=0.69] (Table 4). This finding is consistent with the finding of George, Ugboma and Matai (2012) that gender of the care provider has no impact on the care given to newborn.

Finally, findings from the study revealed that years of working experience of nurses had a significant influence on the quality of neonatal care services given by nurses [χ^2= 25.63, p-value=0.00] (Table 5). Council of International Neonatal Nurses (2009) noted that some

health institutions prefer employing experienced nurses who have practiced for some years to provide neonatal care. This can be attributed to the fact that the nurses who had worked for 6-10 years and above may have attended several update courses on neonatal care and may have developed experience from constant practice in neonatal care compared to the nurses who have worked for 1-5years. Hamilton, Redshew and Tarnow-Mordi (2007) documented that evidence is emerging that chances of survival of the smallest and most preterm infants relate to the experience of the nurse delivering the care.

Conclusions

This Study indicates that essential equipment for neonatal care was available in the tertiary health care institutions in South-Eastern Nigeria and that the availability was in line with the recommendation by World Health Organisation. Gender of nurses had no significant influence on the quality of neonatal care given by nurses. Also years of working experience of nurses had significant impact on the quality of neonatal care given by nurses.

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