Original Article

Knowledge regarding neonatal resuscitation among nurses in a municipality hospital: A cross-sectional study

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Abstract:

Background: *Neonatal resuscitation (NR) is a means to restore life of a baby from the state of asphyxia. It is a single most important intervention for neonates with birth asphyxia. Resuscitation in neonates is more challenging than that of an adult or even an older infant or child. Poor resuscitation techniques can contribute to poor outcome in neonates with birth asphyxia. Nurses being the front-liners to receive the newborn babies, level of knowledge about NR among them can affect the outcome in these patients.*

Objectives: *This study was aimed to assess the level of knowledge regarding neonatal resuscitation among the nurses.*

Methodology: *The study was conducted among the nurses of one of the municipality hospitals of Nepal by using structured self-administered questionnaires and total enumeration sampling method was used. A total of 56 responses were obtained.*

Results: *Among 56 respondents, 51 (94.6%) were in the age group of 20-29 years. Majority of them 52 (92.8%) had inadequate knowledge about neonatal resuscitation and only 4 (7.2%) had adequate knowledge.*

Conclusions: *Majority of the nurses have inadequate knowledge regarding neonatal resuscitation. Training and educational programs for nurses and on neonatal resuscitation can be helpful.*

Keywords: *knowledge, neonatal resuscitation, nurses, municipality hospital.*

Introduction

Neonatal resuscitation (NR) is a means to restore smooth transition of fetal respiratory system to neonatal respiratory system to a baby from the state of asphyxia. It is a single most important intervention during birth asphyxia. Annually, approximately four million babies die within the first month of life and among these deaths, about 99% occur in low-middle income countries.[1] Birth asphyxia is a major cause of global neonatal morbidity as well as mortality. One of the effective measures to prevent these deaths is to have birth attendants skilled in neonatal resuscitation in all the deliveries. A nationwide training programme on neonatal resuscitation in China decreased intrapartum related deaths from 7.5 to 3.4 per 10,000 live births. Several trials have shown that basic neonatal resuscitation training decreases neonatal deaths by up to 20% in low-resource settings.[2] There is the need for data on the knowledge and experience of midwives with regard to neonatal resuscitation to guide government policies on training of midwives in neonatal resuscitation.[3]

The incidence of birth asphyxia is reported to be higher in developing countries than in the developed countries.[4] In Nepal, there are 33 neonatal deaths per 1000 live births and neonatal asphyxia accounts for 20.9% of neonatal deaths. A low cost intervention, basic neonatal resuscitation within the first few minutes of life can substantially prevent neonatal mortality and morbidity attributable to intrapartum related hypoxic events.[7] Health care providers who are working in the labor room should be well trained and proficient in their neonatal resuscitation skills.[6] A study conducted in Ghana to determine knowledge of neonatal resuscitation among midwives, 98.1% of the participants had insufficient knowledge on neonatal resuscitation.[3] Limited studies regarding the particular topic has been carried out among nurses. Referring to this scenario, researchers opted to find out the knowledge regarding neonatal resuscitation among nurses working in a municipality hospital.

Methods

Descriptive, cross sectional study design was used to find out knowledge regarding neonatal resuscitation among nurses.

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Nepal Korea Friendship Municipality Hospital, located in Kathmandu, Nepal, was the study location. Dependent variables were knowledge regarding neonatal resuscitation among nurses and independent variables were sociodemographic findings, profession related information and sources of information for the participants. Health care workers working as a nursing staff, willing to participate and available at the time of data collection were included in the study. There were altogether 56 staffs. Total enumeration method was used for sampling. Those nursing staffs who were willing to participate in the study were included. Written permission from administrative authority of the hospital was obtained. Administrative officers, unit supervisors and nursing in charges were explained about the objectives and process of the study. Written informed consent was obtained from each respondent before data collection. Voluntary participation was ensured. Self- administered questionnaire was distributed and it took on an average 15-20 minutes to fill up the questionnaire. Anonymity, privacy and confidentiality were maintained. Questionnaire consisted of two parts: part I included information related to socio demographic characteristics of the respondents and part II consisted questions related to neonatal resuscitation. The questions were related to the definition of resuscitation, initial steps of resuscitation, APGAR scoring, bag and mask ventilation, chest compression and emergency medications used during resuscitation. Each correct responses were given 1 marks and incorrect responses were not given any marks. Collected data were coded, entered into SPSS (Statistical Package for social science) version 16 and were analyzed using descriptive statistics. All the findings of the study were presented in the tabular form.

Results

Among 56 respondents, 51 (94.6%) were between the age group 20-29 years. More than half 37 (66.1%) were unmarried. The highest number, less than half 27 (48.2%) of respondents have completed proficiency in certificate level nursing. The respondents were from gynecology18 (32.1%), surgery & post-operative 12 (21.4%), paediatrics10 (17.8%), emergency 9 (16.1%), medical 4 (7.1%), and critical care 3 (5.3%) wards. More than half of the respondents 36 (64.2%) had ≥ 2 years of work experience. Majority of respondents 40 (71.4 %) have not done resuscitation procedure during their service period till date, and 44 (78.6 %) have not taken any training related to newborn resuscitation.

Table 1. Knowledge of respondents aboutneonatal resuscitation (n=56)

Variables	Number	Percentage
Meaning of Neonatal Resuscitation	46	82.1
Fetal lungs are filled with fluid	23	41.1
Lung fluid squeezed out during vaginal delivery	15	26.8
Tidal volume for newborn	23	41.1
Immediate steps for baby born with meconium	22	39.3
Newborn normal respiration establishment	27	48.2
Initiation of spontaneous respiration with tactile stimulation	19	33.9
Immediate suctioning in meconium stained	5	8.9
Apgar score in newborn	56	100.0
Maintaining airway	52	92.9
Size of mask for preterm	36	64.3
Rate of ventilation	34	60.7
Evaluation of infant	5	8.9
Ratio of chest compression and ventilation	28	50.0
Site of chest compression	17	30.4
Depth of chest compression	18	32.1
Chest compression till spontaneous heart rate	10	17.9
Chest inflation pressure reading	54	96.4
Chest compression complication	45	80.4
Emergency drug in resuscitation kit	46	82.1
Epinephrine indication	18	32.1
Dopamine uses	40	71.4
Dose of sodium bicarbonate	16	28.6
Epinephrine dose	11	19.6

Table 2 depicts that most of the respondents 46 (82.1%) knew the meaning of neonatal resuscitation. Concerning the time to obtain Apgar scoring in newborn, all 56 (100 %) respondents responded as 1 minute & 5 minutes after birth. Similarly, regarding maintaining airway, almost all 52 (92.9 %) respondents responded as small roll or towel should be place under the shoulder. Regarding emergency drug in resuscitation kit, most of respondent 46 (82.1 %) responded as epinephrine, sodium bicarbonate, normal saline, and naloxone.

Table 2. Level of knowledge of respondents aboutneonatal resuscitation (n=56)

Level of Knowledge	Number	Percentage
Adequate (≥ 85%)	4	7.2
Inadequate (< 85%)	52	92.8

Table 2 illustrates that almost all (92.8%) of respondents had inadequate level of knowledge whereas only (7.2%) had adequate level of knowledge on neonatal resuscitation

Discussion

The finding of present study shows that almost all (94.6%) of respondents were from age group 20-29 years with the mean age 25.19 ± standard deviation 2.28. Likewise more than half

(66 %) of the respondents were unmarried. All (100%) of the respondents are from urban area. Most (85.7%) of the respondents follow Hinduism. Similarly more than half (58.9 %) of the respondents were janajati. Majority (73.2 %) of respondents belongs to nuclear type family. The finding of present study shows that less than half (48.2%) of the respondents had Proficiency Certificate Level of educational qualification. More than half (64.2%) of respondent had work experience of 2 years and more. Majority (71.4 %) of respondents had not done neonatal resuscitation during their service. Likewise majority (78.6%) of respondents had not taken any training regarding neonatal resuscitation which was supported by the study conducted on knowledge and skill of newborn resuscitation among nurses working in Maternity Ward, Nepal where 93% respondents had not taken any training regarding neonatal resuscitation.[5] More than half (51.8%) of respondents mentioned about their main information source about neonatal resuscitation was from nursing curriculum. The finding of present study shows that most (82.1%) of respondents had knowledge about the meaning of neonatal resuscitation. Less than half (39.3%) of respondent responded immediate action with meconium stained baby is to suction the mouth first and then nose which was supported by a retrospective study conducted in Andra Pradesh where (72.73%) had knowledge about the immediate step when a baby was born with meconium stained liquor.[9] Only (8.9%) of respondent responded that the baby delivered with meconium stained liquor should by suctioned as head is delivered. And (100%) respondent responded that APGAR score is checked at 1 min and 5 min after birth. The finding of the present study shows almost all of the respondent (92.9%) mentioned correct positioning during resuscitations which was support by the cross-sectional study conducted in Northeast Ethiopia, where 92.3% had correct response on positioning during resuscitation.[3] Similarly, most of respondents (84.3%) responded as the appropriate size of mask for preterm during resuscitation is '0' which is support by the study conducted on Andra Pradesh, where (95.47%) respondent responded as size of mask for preterm is '0'.

About the optimal ventilation rate, more than half of respondent (60.7%) responded 40-60 breaths per minutes which is supported by the study conducted on Andra Pradesh, where (72.73%) response are correct. Only (8.9%) respondent responded about the need for evaluation of infant during resuscitation by observing heart rate and respiration which was supported by the study conducted on Andra Pradesh, where (77.27%) response correctly.[9] The findings of the present study shows that half of respondents (50%) knew that the rate of chest compression to ventilation is 3:1 which was supported by the study conducted in Northeast Ethiopia where 82.5% respondent responded correctly.[3] Only 17.9% of respondents were aware that chest compression should be continued till heart rate is greater than 100 beats/min. Concerning appropriate inflation pressure reading, almost all (96.4%) respondents knew about visible chest expansion. This is supported by the study conducted on Andra Pradesh, where 81.82% respondents knew that inflation pressure can be read by visible chest expansion.[9] Most of the respondents (80.4%)

were aware that fracture, pneumothorax and laceration of liver are possible complications of chest compression. The findings of the present study show that most of the respondents (82.1%) responded resuscitation kit should contain emergency drugs like epinephrine and normal saline. This is supported by a study conducted in South Wollo, Northeast Ethiopia where 83.2% respondents answered correctly.[12] Concerning indication of dopamine use, majority of respondents (71.4%) knew the indication being persistent hypotension. Only 19.6% respondents were aware that the dose of epinephrine is 1:10000.

Personnel trained in basic resuscitation should be present at all deliveries and personnel trained in advanced resuscitation should be present at deliveries with known risk factors. Newborn resuscitation skills are essential for all health care providers who are involved in the delivery of newborn. During every birth, the nurse should be prepared to resuscitate a newborn because resuscitation may be necessary for each newborn. Every birth should be attended by at least one person skilled in neonatal resuscitation.[10] Improvement in the quality of neonatal resuscitation (NR) techniques is therefore crucial for the reduction of early neonatal deaths and, by extension, reduction in the infant mortality rate in the developing world.[11] Adequate knowledge and awareness about neonatal resuscitation plays a major role in early diagnosis, appropriate management and, accordingly, reduction of adverse consequences. The study conducted in Tanzania demonstrated 47% reduction in early neonatal mortality and a 24% reduction in rates of fresh still-birth after Helping Babies Breathe (HBB) was implemented. The number of fresh still births was reduced from 19 per 1000 birth to 14.4 per 1000 births, this was 24% after 2 years. HBB includes using simple techniques like keeping the baby warm, rubbing the baby dry, suctioning the baby's mouth and if necessary, correct application of a resuscitator for face mask ventilation.[11] The majority of the nurses were found to have insufficient knowledge. There is an urgent need to focus on education in order to upgrade nurses' knowledge and thus improve the quality of nursing care.[12]

The findings of this study may not be generalizable since this research study was conducted in small number of nurses from a single center. The study might be helpful as a reference material and as a baseline information on related topic for further study. The similar study regarding neonatal resuscitation can be carried out among the pediatric nurses, midwives and community nurses. Intervention like regular in-service training on newborn resuscitation are required to improve the knowledge.

Conclusion:

In this study, majority of the nurses have inadequate level of knowledge about neonatal resuscitation. Formal educational programs and training related to neonatal resuscitation can enhance their knowledge.

Conflicts of interest: None

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