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Original Research Article

Knowledge and Skill of Newborn Resuscitation among Nurses Working in Maternity Ward

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ABSTRACT

Each year millions of neonates do not breathe immediately at birth and among them the majority requires basic newborn resuscitation. Competency in newborn resuscitation is critical in delivery rooms to ensure the safety and health of neonates. The objective of the study was to identify the knowledge and skill of nurses regarding newborn resuscitation. A descriptive cross sectional study design was used to identify the knowledge and skill of nurses regarding newborn resuscitation. Census method was used to select the participants. Total 86 nurses working in maternity ward of nongovernmental health institution of Parsa District were interviewed by using semi-structured interview schedule and skill was assessed by observational rating scale. The study findings revealed that 93% respondents had inadequate knowledge (<85% score) and 90.7% respondents had insufficient skill (< 85% score) on Newborn Resuscitation. The level of skill on Newborn resuscitation is statistically significant with total working experience (p=0.034), Working experience in maternity ward (p=0.028) and Newborn Resuscitation training (p=<0.001). Regarding correlation between knowledge score and skill score, the findings revealed that there was statistically significant positive correlation between the knowledge score and skill score of respondents regarding newborn resuscitation (p<0.0018). The study concluded that the knowledge and skill level of nurses on newborn resuscitation were inadequate and poor simultaneously and the knowledge score of nurses was significant positive correlated with skill score of nurses on newborn resuscitation.

Key Words: newborn resuscitation, neonates, nurses

INTRODUCTION

130 million babies born every year, about 4 million die in the first 4 weeks of life- the neonatal period. Most neonatal deaths (99%) arise in low income and middle income countries. (1)

In Nepal, there have been remarkable reductions in both under-five child mortality and maternal mortality over the last 15 years. The neonatal mortality has stagnated within the same period. Nepal has 33 neonatal deaths per 1000 live births which contributes 61% of all the under-five deaths. (2)

Neonatal Asphyxia accounts for 20.9% of neonatal deaths. Although the majority of newly born infants (90%) do not require intervention to breathe during transition from intrauterine to extrauterine life, approximately 10% of the newborns require some assistance to begin breathing at birth, and about 1%require extensive resuscitative measures. (2) 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. (3)

Newborn resuscitation is defined as the set of interventions at the time of birth to support the establishment of breathing and circulation. [(4)] The goals of neonatal resuscitation are to prevent the morbidity and mortality associated with hypoxic-ischemic tissue (brain, heart and kidney) injury and also to re-establish adequate spontaneous respiration and cardiac output. [(4)]

Proper knowledge of newborn resuscitation can prevent the consequences of perinatal asphyxia. An organized knowledge and awareness of the necessity to undertake resuscitative procedures in the newborn play an important role in proper, early diagnoses, suitable management and reducing the number of complications in newborns with life-threatening conditions. [(5)]

The study findings might be useful for health care planners to plan programs to improve knowledge and skill of nurses regarding newborn resuscitation. The study might be useful to prepare IEC (information, Education and communication) materials related to newborn resuscitation that might be helpful to improve the knowledge and skill of newborn resuscitation among nurses.

Purpose of the study: The purpose of the study was to identify the knowledge and skill of nurses regarding newborn resuscitation. Proper knowledge and skill of resuscitation regarding newborn resuscitation can prevent the consequences of perinatal asphyxia. So this study will help nurses in maternity ward to provide knowledge and skill to undertake resuscitative procedures in the newborn that play an important role in proper, early diagnoses, suitable management and reducing the number of complications in newborns with life-threatening conditions.

Aim: The main aim of the study was to identify the knowledge and skill of nurses regarding newborn resuscitation.

Objectives: The objectives of the study were:

- To assess the knowledge of nurses regarding newborn resuscitation.
- To assess the skill of nurses regarding newborn resuscitation.
- To find out the association between socio-demographic variables and knowledge of nurses regarding newborn resuscitation.
- To find out the association between socio-demographic variables and skill of nurses regarding newborn resuscitation.
- To find out the relationship between knowledge and skill of nurses regarding newborn resuscitation.

Significance of the study

The study findings might be useful for health care planners to plan programs to improve knowledge and skill of nurses regarding newborn resuscitation. The study might be useful to prepare IEC (information, Education and communication) materials related to newborn resuscitation that might be helpful to improve the knowledge and skill of newborn resuscitation among nurses. It might be useful to the researcher for the further study in this area.

MATERIALS AND METHODS

Research Design: The descriptive cross sectional study design was used to conduct this study.

Research setting and population: The study was carried out in maternity services providing Non-Governmental health institutions of Parsa district. There were total 10 Non-Governmental health institution in Parsa district, among them only six institutions provided maternity services; those were National Medical College Teaching Hospital, Advance Medicare Hospital, Krishna Hospital, Shree Bhawani Hospital, Birgung Health Care Hospital, Sarbottam Bal Tatha Mahila Hospital. All the six institutions were selected for data collection.

Sampling: Census method was used to select the subjects in the study. Total study population was 86 nurses who were working

in maternity ward were selected for the study.

Instrument: Semi-structured interview schedule was used to find out the socio-demographic data and knowledge of nurses regarding newborn resuscitation. Observational Rating scale was used to find out the skill of nurses regarding newborn resuscitation.

Items related to age, working experience, working experience in maternity ward, in-service training, availability of resuscitation articles and number of newborn resuscitation performed in last six months were included to obtain socio-demographic data. Five items related to preparation, seven items related to positioning and suctioning , 11 items related to ventilation, one item related to discontinuation and two items related to post resuscitation task were included to assess the knowledge regarding newborn resuscitation. Likely Eight items related to getting ready, Seven items related to ventilation, three items related to post resuscitation task were included in observational rating scale to assess skill regarding newborn resuscitation.

Data collection procedure: Data was collected after getting ethical clearance from Institutional Review Board of National Medical College. Written Permission was obtained from all the six institutions prior to commencement of the study. Written informed consent from each respondent was also taken prior to data collection.

At first, data regarding socio-demographic was collected then the data regarding knowledge of newborn resuscitation was collected. Immediately after, the researcher had organized necessary settings to assess the skill of newborn resuscitation of participants in a mannequin and assessed the skill of newborn resuscitation using Rating Scale. The duration of the data collection was 40-45 minutes.

Statistical Analysis: Data was analyzed in Statistical Package for Social Science (SPSS) 20 version. Fisher exact test was used to find out the association between levels of knowledge, level of skill with selected socio-demographic variables. The Karl Pearson's coefficient of correlation was used to identify the correlation between level of knowledge and level of skill of nurses regarding newborn resuscitation.

RESULTS

TABLE 1: Age, Total Working Experience, Working Experience of Respondents n=86

Variables	Frequency	Percentage
Age(Year)		
20-24	60	69.8
25-29	16	18.6
30-34	5	5.8
35-39	2	2.3
≥40	3	3.5
Total working experience		
<2	38	44.2
2-4	30	34.9
4-6	7	8.1
6-8	3	3.5
8-10	2	2.3
≥10	6	7.0
Working experience in maternity ward		
≤2	68	79.1
2-4	9	10.5
4-6	4	4.7
≥6	5	5.8

Mean age =24 year

Table 1 reveals 69.8% were in the age group of 20-24 years, 44.25% of respondents had below 2 years working experience, 79.1%respondents had up to 2 years working experience in maternity ward.

TABLE 2: In-service Training, Availability of Resuscitation Articles and performed Number of Newborn Resuscitation of respondents n=86

Variables	Frequency	Percentage
In-service training (n=86)		
Yes	6	7.0
No	80	93.0
Availability of resuscitation articles(n=86)		
Yes	86	100.0
No. of newborn resuscitation performed (n=86)		
<10	9	10.5
10-19	62	72.1
20-29	9	10.5
≥30	6	7.0

Table 2 shows most (93%) of respondents had not got in-service training on newborn resuscitation and only 7% respondents got in-service training on newborn resuscitation. all respondents had sufficient availability of required articles for newborn resuscitation. Regarding number of newborn resuscitation performed, 72.1% of

respondents had performed 10 -19 newborn resuscitation in last six month where as only 7.0% of respondents had performed 30 or more newborn resuscitation in last six month.

TABLE 3: Respondent's Knowledge Score on Newborn Resuscitation n=86

Variables	Mean Score± SD	Percent of Mean Score	Range
Respondents knowledge score	17.16±2.68	66	10-23

Table 3 reveals that the mean score of respondents' knowledge on newborn resuscitation was 17.16 ± 2.68standard deviation; percent of mean score was 66, range was 10-23.

TABLE 4: Respondents' Level of Knowledge Regarding Newborn Resuscitation n=86

Level of knowledge	Frequency	Percentage
Inadequate Knowledge	80	93
Adequate Knowledge	6	7

Table 4 reveals that 93% of respondents had inadequate knowledge where as 7% had adequate knowledge regarding newborn resuscitation. Score ≥85% is categorized as adequate/good knowledge and score <85% is categorized as inadequate / poor knowledge. Grading was done according to instruction contained in one of the research article. [(10)]

TABLE 5: Respondents' Level of skill regarding Newborn Resuscitation n=86

Level of skill	Frequency	Percentage
Insufficient / Poor Skill	78	90.7
Sufficient / Good skill	8	9.3

TABLE 6: Association between respondents' Level of Overall Knowledge regarding Newborn Resuscitation and Selected Socio-demographic Variables n=86

Demographic Variable	Level of knowledge		p-value
	Inadequate n(%)	Adequate n (%)	
Age (in years)			0.17
<25	54(90.0))	6(10.0)	
≥25	26(100)	0(0)	
Total working experience (in years)			
<2	35(92.1)	3(7.9)	0.76
≥2	45(93.8)	3(6.2)	
Working experience in maternity ward (in years)			
<2	62(91.2)	6(8.8)	0.33
≥2	18(100)	(0)	
In-service training on newborn resuscitation			
Yes	5(83.3)	1(16.7)	0.33
No	75(93.5)	5(6.2)	
No. of newborn resuscitation performed			
<10	8(88.9)	1(11.1)	0.60
≥10	72(93.5)	5(6.5)	

Significance level at 0.05 P- values was computed from Fisher's Exact Test.

Table 5 shows that 90.7% of respondents had insufficient/poor skill on newborn resuscitation where as 9.3% had sufficient/good skill on newborn resuscitation. Score ≥85% is categorized as adequate/good knowledge and score <85% is categorized as inadequate / poor knowledge. Grading was according to instruction contained in one of the research article. [(10)]

Table 6 reveals that there was no significant association between the level of knowledge regarding newborn resuscitation and age (p=0.17), total working experience (p=0.76), Working experience in maternity ward (p=0.33), in-service training (p=0.33) and no. of newborn resuscitation performed in last six month (p=0.60).

TABLE 7: Association between respondents' Level of Overall Skill regarding Newborn Resuscitation and Selected Socio-demographic Variables

Demographic Variable	Level of skill		p- value
	Poor (%)	Good (%)	
Age (in years)			0.69
<25	55(91.7)	5(8.3)	
≥25	23(88.5)	3(11.5)	
Total working experience (in years)			
<3	64(94.1)	4(5.9)	0.034*
≥3	14(77.8)	4(22.2)	
Working experience in maternity ward(in years)			
<3	70(93.3)	5(67)	0.028*
≥3	8(72.7)	3(27.3)	
In-service training on newborn resuscitation			
Yes	0(0.0)	6(100)	<0.001*
No	78(97.5)	2(2,5)	
No. of newborn resuscitation performed			
<10	21(100)	0(0.0)	0.19
≥10	57(87.7)	8(12.3)	

***Significance level at 0.05 p-Values computed from Fisher exact test**

Table 7 shows that there was significant association between the level of skill regarding Newborn resuscitation and total working experience (p=0.034), Working experience in maternity ward (p=0.028) and In-service training on newborn resuscitation (p=<0.001) .Those respondents' who had 3 years or more than

3 years working experience had sufficient skill than those who had less than 3 years working experience. Likewise, those respondents' who had 3 years or more than 3 years working experience in maternity ward had sufficient skill than those who had less than 3 years working experience in maternity ward. Those respondents' who had got in-service training on newborn resuscitation had sufficient skill than those who had not got in-service training. While there was no significant association between the skill regarding Newborn resuscitation with age (p=0.63), No. of newborn resuscitation performed in last six month (p=0.19**).**

TABLE 8: Correlation between Knowledge score and skill score of Respondents on Newborn Resuscitation n=86

Variables	Correlation	P-value
Knowledge score and Skill score	0.529	<0.0018*

*** Significant at the level of (p=0.05).**

Table 8 shows Correlation between knowledge score and skill score, there was statistically significant positive correlation between the knowledge score and skill score of respondents' regarding newborn resuscitation(P<0.0018). As the knowledge score of nurses on newborn resuscitation increases, skill score of newborn resuscitation also increases. As the knowledge score of nurses on newborn resuscitation decreases, skill score of newborn resuscitation also decreases.

DISCUSSION

The study revealed that 93% of respondents had inadequate knowledge (score <85%) regarding newborn resuscitation. The mean of the respondents knowledge score on newborn resuscitation was 17.16 ± 2.68 standard deviation; percent of mean score was 66, range was 10-23. The finding was supported by some of the studies done at Ethiopia and Kenya. Study of Ethiopia showed that range of knowledge score of health professionals were 13 to 27, mean knowledge score of health Professionals' were19.9±3.1 standard deviation whereas mean knowledge score of nurses were 20.2±.2.94 standard deviation, the mean knowledge score of nurses was poor (43.9%) and the overall knowledge about neonatal resuscitation in health professionals was poor(<80%).. [(6)] Study done at Kenya in 2012 which revealed that minimum participants(35.4%) had good knowledge (≥85%). [(7)]

The study showed that most of respondents 78(90.7%) had insufficient skill on newborn resuscitation. The findings were supported be one of the studies which revealed that mean skill score of nurses was poor (55.8%). [(6)]

The finding of that study revealed that there was no significant association between the level of knowledge regarding newborn resuscitation with age (p=0.17), total working experience (p=0.76). Working experience in maternity ward (p=0.33), in-service training (p=0.33) and no. of newborn resuscitation performed in last six month (p=0.60). The findings were supported by the study done in Ethiopia which revealed that there was no significant association in the knowledge score of participants in terms of age (p=0.029), year of service (p=0.391) and place of previous work (p=0.209). [(6)] This findings was contradictory to the some of the research findings of one of the study that revealed that Participants who had previously worked in the delivery room and special care baby unit had better knowledge of NR than those who had not, and this difference was statistically significant (p=0.022) as well as a significantly higher proportion of participants who had recently attended an NR training course than of participants who had no such training had adequate knowledge of NR(p=0.023). [(8,9)] The reason for the disparity is not clear, but it might be less participants in my study and participants selected from nongovernmental health institution.

This study revealed that level of skill on Newborn resuscitation is statistically significant with total working experience (p=0.034), Working experience in maternity ward (p=0.028) In-service training on

newborn resuscitation (p=<0.001). It was supported by the study done at Ethiopia and Afghanistan. [6,9]

This study revealed that there was no significant association in skill scores of participants with age (p=0.372), year of service (p=0.121) and place of previous work (p=0.214). Similar findings was found on one of the study which showed that skill regarding Newborn resuscitation is not statistically significant with age (p=0.63), No. of newborn resuscitation performed in last six month (p=0.19). [10]

This study revealed that there was statistically significant positive correlation between the knowledge score and skill score of respondents regarding newborn resuscitation (P<0.0018). No similar research findings were found to support the study. This might be due to limited study done in this research topic.

Due to limitation of time, the study is conducted in nongovernmental health institution so findings may be hard to generalize in governmental health institution. Similar study can be conducted in large scale for generalization. Interventional study can be also conducted to see the effectiveness.

CONCLUSION

Nurses should be always prepared to deliver newborn resuscitation. Poor knowledge and poor skill regarding newborn resuscitation among nurses observed in the study. Newborn resuscitation skill are good among Nurses who got related training, and having more working experience in maternity ward. Intervention like regular in-service training on newborn resuscitation are required to improve the knowledge and skill of newborn resuscitation hence they can provide newborn resuscitation in correct way and that will be helpful in reducing the mortality and morbidity related to neonatal asphyxia.

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