

## KNOWLEDGE GAINED FROM A BRIEF SIMULATION-BASED TRAINING ON BASIC NEONATAL RESUSCITATION AMONG NEWLY APPOINTED NURSES - A RETROSPECTIVE STUDY

Chandrashekar M. A<sup>1</sup>, Harsha P. J<sup>2</sup>, Janakiraman P<sup>3</sup>, Shaik Jareena<sup>4</sup>, Gopireddy Sravya<sup>5</sup>

<sup>1</sup>Associate Professor, Department of Paediatrics, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh.

<sup>2</sup>Associate Professor, Department of Paediatrics, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh.

<sup>3</sup>Statistician, Department of Community Medicine, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh.

<sup>4</sup>Postgraduate Student, Department of Paediatrics, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh.

<sup>5</sup>Postgraduate Student, Department of Paediatrics, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh.

### ABSTRACT

#### BACKGROUND

Assessing the need of resuscitation and ventilation with bag and mask if needed soon after birth to initiate breathing can decrease neonatal mortality and morbidity. The knowledge on basic neonatal resuscitation which deals with above is important.

#### MATERIALS AND METHODS

This was a retrospective observational study done from January 2017 to July 2017. The training records of newly appointed nurses on basic neonatal resuscitation were analysed to know the knowledge gained and gaps in knowledge.

#### RESULTS

Total 22 newly appointed nurses underwent training. There was no statistically significant difference between mean of pre and post-test, though the post-test performance was slightly better. There was knowledge gap on how long to count the heart rate and after what time the heart rate should be assessed after starting ventilation in newborn requiring resuscitation.

#### CONCLUSION

Retraining should be done in newly appointed nurses on basic newborn resuscitation to improve and retain knowledge and skills.

#### KEYWORDS

Newborn, Basic newborn resuscitation, Birth Asphyxia, Training.

**HOW TO CITE THIS ARTICLE:** Chandrashekar MA, Harsha PJ, Janakiraman P, et al. Knowledge gained from a brief simulation-based training on basic neonatal resuscitation among newly appointed nurses - a retrospective study. J. Evid. Based Med. Healthc. 2018; 5(30), 2218-2221. DOI: 10.18410/jebmh/2018/459

#### BACKGROUND

Birth asphyxia can be countered by effective resuscitation. About 10 percent babies need some assistance to breath at birth. Only 1 percent of babies born at birth require intubation, rest can be managed by effective bag and mask ventilation.<sup>1-4</sup> Presence of trained personnel to assess need of resuscitation at birth and who can deliver bag and mask ventilation if needed is an important step.<sup>2,3</sup> Strengthening the knowledge on basic newborn resuscitation and skills is enough to save many babies in low resource countries.<sup>5</sup> Training in basic neonatal resuscitation is important in developing countries.<sup>6</sup>

The training records of newly appointed nurses were assessed in this study to know the knowledge gaps. This will be of help during future training.

*Financial or Other, Competing Interest: None.*  
*Submission 30-06-2018, Peer Review 05-07-2018,*  
*Acceptance 14-07-2018, Published 18-07-2018.*  
*Corresponding Author:*

*Dr. Harsha P. J,*

*Associate Professor, Department of Paediatrics,*  
*PES Institute of Medical Sciences and Research,*  
*Kuppam, Chittoor District – 517425, Andhra Pradesh.*

*E-mail: harshabattery@gmail.com*

*DOI: 10.18410/jebmh/2018/459*



#### MATERIALS AND METHODS

##### Study Design

Retrospective observational study.

##### Setting

Department of Paediatrics, PES Institute of Medical Sciences and Research, Kuppam, Andhra Pradesh.

##### Study Period

January 2017 to July 2017.

##### Source of Data

Records on training of newly appointed nurses to paediatrics, operation theatre and labour ward on basic newborn resuscitation.

##### Aim

To assess the pre and post-test knowledge on basic newborn resuscitation among newly appointed nurses.

##### Inclusion Criteria

Newly appointed nurses who underwent training on basic newborn resuscitation.

The training records of newly appointed nurses to paediatrics, labour ward and operation theatre were retrieved. It is hospital policy to train all the newly appointed nurses to undergo training on basic newborn resuscitation in the above-mentioned departments. The training is given based on the 'Basic Newborn Care and Resuscitation Program (BNCRP) Training Manual' adopted from 'Navjaat Shishu Suraksha Karyakram (NSSK)' (Ministry of Health and Family Welfare, Government of India). The training consists of teaching on above guidelines and practical demonstration for duration of one hour. Pretest and post-test are given during the training. A set of same 20 questions are used for pretest and post-test during training. Time allotted for pretest and post-test was 20 minutes each. The answers to questions were in form of true or false. The response to questions was tabulated. The categorical data were analysed using percentages and the continuous data are analysed using mean and standard deviation. Paired t-test was used to analyse the data. A probability value of less than 0.05 was considered as statistically significant.

**RESULTS**

Basic newborn resuscitation training was given to 22 newly appointed nurses as per the inclusion criteria. The lowest score in pretest was 11/20 (50%) and highest score was 20/20 (100%). The lowest score post-test was 12/20 (60%) and highest was 20/20 (100%). The cut-off for clearing the training was 80% (16/20). Total 13/22 (59.1%) cleared at the end of post-test. Retraining was given to rest 9/22 (40.9%). Comparison of pretest and post test scores is shown as in table-1.

Variable	Mean	Standard Deviation	95% Confidence interval
Pretest	15.05	2.42	13.97 – 16.12
Post-test	15.54	1.99	14.66 – 16.43

**Table 1. Comparison of Pretest and Post-test Scores Among the Participants**

Paired t test was applied to the mean of pre and post-test. The p value was 0.328 which was not statistically significant.

The knowledge of basic newborn resuscitation in various aspects is shown in table 2 and 3.

Areas of Knowledge (Answered Correct in Each Area Shown)	Pretest n-22	Post-test (n-22)
<b>Basic Knowledge and Preparedness for Resuscitation</b>		
1. 10% newborn require some assistance at birth to begin breathing	21 (95.45%)	22 (100%)
2. Presence of skilled person during each delivery	11 (50%)	10 (45.45%)
3. Ventilation of lungs is important if neonate requires resuscitation	20 (90.91%)	20 (90.91%)
4. Bag and mask should always be available in labour room	12 (54.45%)	13 (59.09%)
5. Need for assessment of all newborns for requirement of resuscitation immediately after delivery	18 (81.82%)	19 (83.36%)
<b>Action to be Taken in Different Scenarios</b>		
1. Suctioning of mouth first in non-vigorous baby with meconium	18 (81.82%)	21 (95.45%)
2. Routine steps to be taken if baby is not crying after birth	22 (100%)	20 (90.91%)
3. Role of stimulation, bag and mask ventilation to initiate breathing	19 (86.36%)	22 (100%)
4. Need of resuscitation in baby not crying at birth, no activity and cyanosed	16 (72.73%)	11 (50%)
5. Technique of tactile stimulation	19 (86.36%)	19 (86.36%)

**Table 2. Knowledge on Various Aspects of Basic Newborn Resuscitation**

Area of Knowledge (Answered Correct in Each Area Shown)	Pretest n-22	Post-test (n-22)
<b>Knowledge on Ventilation</b>		
1. Bag and mask can initiate breathing in majority of non-breathing babies at birth	18 (81.82%)	18 (81.82%)
2. Volume of bag used for ventilating a new-born (240-500ml)	18 (81.82%)	20 (90.91%)
3. Selection of correct size mask	21 (95.45%)	21 (95.45%)
4. Looking for chest rise immediately after starting bag and mask ventilation	18 (81.82%)	20 (90.91%)
5. Actions to be taken if chest is not rising adequately after bag and mask ventilation	17 (77.27%)	18 (81.82%)
6. Rate of bag and mask ventilation per minute	16 (72.73%)	21 (95.45%)
7. Increase in heart rate to assess improvement after bag and mask ventilation	17 (77.27%)	19 (86.36%)
8. How long to count heart rate during resuscitation	4 (18.18%)	3 (13.64%)
9. Time of first assessment of heart rate after starting bag and mask ventilation	3 (3.64%)	5 (22.73%)
10. If oxygen is not available, baby can be still be ventilated effectively	22 (100%)	20 (90.91%)

**Table 3. Knowledge on Ventilation in Basic New-Born Resuscitation**

## DISCUSSION

There was no statistically significant difference between mean of pre and post-test scores in this study. Out of 22 only 3 nurses had experience in working in a paediatric set up earlier and all scored above 80% at post-test (one scored 100%). Remaining nurses were fresh passed out graduates passed out, who didn't have previous work experience. Few had language problems in understanding which was communicated at end of session. When the same questions were asked in local language majority nurses were able to answer correctly. Retraining was given to those who did not score 80% at the end of pretest.

The teaching was classroom teaching for one hour with few practical demonstrations on use of bag and mask ventilation, choosing correct size mask. There were huge knowledge gaps at the end of session in following fields.

1. Presence of skilled birth attendant for each delivery.
2. Need of resuscitation if baby is not crying at birth, no activity and cyanosed.
3. How long to count heart rate during resuscitation (count for 6 seconds and multiply by 10).
4. After what duration first reassessment of heart rate should be done to assess efficacy of bag and mask ventilation (30 seconds).

There was slight decrease in knowledge on requirement of skilled birth attendant at birth for every delivery, action to be taken after birth if baby is not crying after birth at the end of post-test compared to pretest. There was confusion on how long to count and when to count heart rate after starting bag and mask resuscitation. Majority had confusion on neonatal resuscitation guidelines with basic life support guidelines which persisted even after post-test. This was the reason for marking wrong answer for assessment of heart rate. The issues were addressed at the end of training by the trainer.

Training of neonatal resuscitation for midwives, nurses should be emphasized as the knowledge and skills on resuscitation was sub standardized.<sup>7</sup> Regular training of nurses may possibly have positive effect in reducing undesirable health events especially in resource constrained settings.<sup>8</sup> Increasing the duration and quality of training during the nursing graduation will improve neonatal outcome.<sup>9</sup>

Knowledge gaps can be assessed. Measures can be taken to improve training. There is modest improvement in knowledge in trainees when assessed over time. Retraining is needed to improve knowledge and skills on neonatal resuscitation.<sup>5,10,11</sup> Virtual classroom training was found to be effective in improving knowledge on neonatal resuscitation.<sup>12</sup>

Birth Asphyxia accounts for 9% of neonatal deaths. It can be countered by effective resuscitation. Neonatal resuscitation programs training are low cost interventions. It can effectively reduce intrapartum related deaths by up to 30%.<sup>6,13</sup>

## Limitations of the Study

The study population was less. Only training records of newly appointed nurses were assessed. One-hour classroom teaching was done with demonstration of use of bag and mask ventilation. Long session with practical hands on skill was not done.

## CONCLUSION

There should be more frequent training on basic neonatal resuscitation to retain knowledge among newly appointed nurses. Practical skills and knowledge gaps need to be emphasized during future training.

## REFERENCES

- [1] Basic Newborn Care and Resuscitation Program Training Manual. NSSK. (Internet). Available from: <http://www.nihfw.org/pdf/NCHRC-Publications/NavjaatShishuTrgMan.pdf>
- [2] Goudar SS, Somannavar MS, Clark R, et al. Stillbirth and newborn mortality in India after helping babies breathe training. *Pediatrics* 2013;131:e344-e352.
- [3] Dempsey E, Pammi M, Ryan AC, et al. Standardised formal resuscitation training programmes for reducing mortality and morbidity in newborn infants. *Cochrane Database of Systematic Reviews* 2015;9:CD009106.
- [4] Patel A, Khatib MN, Kurhe K, et al. Impact of neonatal resuscitation trainings on neonatal and perinatal mortality: a systematic review and meta-analysis. *BMJ Paediatrics Open* 2017;1(1):e000183.
- [5] Kim YM, Ansari N, Kols A, et al. Assessing the capacity for newborn resuscitation and factors associated with providers' knowledge and skills: a cross-sectional study in Afghanistan. *BMC Pediatr* 2013;13:140.
- [6] Lee AC, Cousens S, Wall SN, et al. Neonatal resuscitation and immediate newborn assessment and stimulation for the prevention of neonatal deaths: a systematic review, meta-analysis and Delphi estimation of mortality effect. *BMC Public Health* 2011;11 Suppl 3:S12.
- [7] Gebreegziabher E, Aregawi A, Getinet H. Knowledge and skills of neonatal resuscitation of health professionals at a university teaching hospital of Northwest Ethiopia. *World J Emerg Med* 2014;5(3):196-202.
- [8] Subbiah N, Sarin J, Jeeva S, et al. Effectiveness of educational intervention on neonatal resuscitation among nursing personnel. *Health And Population - Perspectives and Issues* 2012;35(1):36-45.
- [9] Murila F, Obimbo MM, Musoke R. Assessment of knowledge on neonatal resuscitation amongst health care providers in Kenya. *Pan Afr Med J* 2012;11:78.
- [10] Lai NM, Ngim CF, Fullerton PD. Teaching medical students neonatal resuscitation: knowledge gained and retained from a brief simulation-based training workshop. *Educ Health* 2012;25:105-110.
- [11] Reisman J, Arlington L, Jensen L, et al. Newborn resuscitation training in resource-limited settings: a

systematic literature review. *Pediatrics* 2016;138(2):e20154490.

[12]Agrawal N, Kumar S, Balasubramaniam SM, et al. Effectiveness of virtual classroom training in improving the knowledge and key maternal neonatal health skills of general nurse midwifery students in Bihar, India: a

pre- and post-intervention study. *Nurse Educ Today* 2016;36:293-297.

[13]Noor T, Raza N, Haq G. Neonatal resuscitation: a knowledge gap amongst obstetrical trainees. A cross-sectional survey amongst medical graduates of Civil Hospital Karachi. *J Pak Med Assoc* 2014;64(7):856-859.