A study to assess the effectiveness of Neonatal resuscitation Programme, First Golden minute certified training Course on knowledge and skill set of Nurses working in selected Hospital of Pune city

Nursing

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ABSTRACT

Worldwide approximately one million babies die per year due to asphyxia out of which about one third approximately 3 lakhs contributed by India. A single intervention - resuscitation - deals with the problem of birth asphyxia as it occurs.The main objectiveis to assess the effectiveness of Neonatal resuscitation training course of one day duration, among the nurses, working in the selected hospitals of Pune city immediately after the training (Post test I) and after a gap of three months (Post test II) . Paired t-test was applied for comparison of pretest scores with posttest 1 and posttest 2 scores. Corresponding p-values were of order of 0.000, which were small (less than 0.05), the null hypothesis is rejected. The knowledge and skill set of nurses improved immediately after Neonatal resuscitation training course of one day duration. The effect was more significant even after 3 months.It concludes that nurses working in maternity hospitals should get periodical exposure on Neonatal resuscitation programmes to update their knowledge and skill set

Introduction:

Worldwide approximately one million babies die per year due to asphyxia out of which about one third, approximately 3 lakhs is contributed by India. A single intervention - resuscitation - deals with the problem of birth asphyxia as it occurs. The need for resuscitation should always be anticipated[1]. Thus, every birth attendant should be skilled in newborn resuscitation, (including anticipation, preparation, timely recognition and quick and correct action) and should have the necessary equipment and supplies - clean and functioning - to be able to respond quickly and correctly when needed. Adequate ventilation is more important than additional oxygen, quick action with the bag and mask is more important than intubation. Therefore resuscitation can and should be initiated virtually anywhere, including those places where oxygen is not available. The choice of device for ventilation is not as important as how effectively it is used. The most common causes of failed resuscitation are failure to recognize the problem promptly, not reacting quickly enough and not ventilating effectively. Correct technique and assessment of the effectiveness of ventilation are critical[2].

Advanced procedures (chest compression, intubation, use of drugs) are needed only in a small proportion of cases[2]. These procedures have strict indications and are beneficial only in specific circumstances and if carried out by an experienced person. In reality, even the simplest equipment is frequently not available and skilled health workers are lacking. In many places only one birth attendant is normally present at the birth, dividing her attention between the mother and the newborn. I Basic resuscitation, done correctly, will help most, even where only few resources and simple training are available[2].

Neonatal resuscitation means to revive or restore life to a baby from the state of asphyxia. The aim of neonatal resuscitation program is to teach the steps necessary to ventilate a newborn baby that is not breathing and protect the life of baby. Ninety percent of newly born babies make the transition from intrauterine to extra uterine life without difficulty. They require little or no assistance to begin spontaneous and regular respirations. Approximately 10 % of newborn require some assistance to begin breathing at birth and only about 1% may need extensive resuscitative measures to survive[3].

In higher income settings Newborn Life Support (NLS) training courses have proliferated. Although these can be expensive little is known about the effect they actually have on health worker behaviour in practice settings 4. Where studies on the effect of life support training for any age group have been done they focus mostly on knowledge and skill retention observed in simulated practice following course participation. Few studies have examined outcomes considered more useful such as morbidity, mortality or work-place provider practices4. Furthermore, the few studies on provider behaviour were all methodologically weak and therefore very little confidence could be attached to their results 4. The aim of this study was therefore to determine if a simple, one day newborn resuscitation training alters health worker resuscitation practices in a busy public hospital in a low-income setting.

Objectives:

To assess the existing knowledge and skill set pertaining to neonatal resuscitation programme among Nurses working in selected hospitals of Pune city.

To assess the effectiveness of Neonatal resuscitation training course of one day duration, among the nurses, working in the selected hospitals of Pune city immediately after the training (Post test I) and after a gap of three months (Post test II) .

Materials and Methods
Study design
Participants and Randomization Procedure
The study was conducted in four selected hospitals of Pune city, Maharashtra. 4 hospitals were selected randomly with the help of simple random technique. These hospitals provide mainly maternity facilities and delivery rate is 3600deliveries each year.

The main objective of this study was to test the effect of resuscitation trainingprogramme in terms of knowledge and skill among nurses working in labour ward and operation theatre. Total participants were255 nurse / midwifery staff, were selected by using simple random technique.

Intervention
The intervention was purposely designed by the investigator as per the guidelines given by India Academy of Pediatrics. The form of training drew as per the instruction and guidelines given by Indian Academy of Pediatrics. This one day course taught the Preparation for Birth, Routine care for new born, initial steps (Positioning, stimulation, suctioning and repositioning), Brief Ventilation, Prolonged ventilation with normal heart rate and prolonged ventilation with slow heart rate. This training programme was mainly focused on understanding the simple approach to resuscitation and practical

scenario sessions using newborn manikins to develop skills in rapid assessment, routine care of new born, Initial and use of a bag-valve-mask device. The investigators have conducted total 6 Training programmes, each training programme had 40 participants. The 40 students were divided into the four groups. Each group was facilitated by one trainer who has certified as Trainer of trainees (TOT) under Indian Academy of Pediatrics. Participants were provided a simple instruction manual two weeks before the training for self-learning. At the beginning of the training, traineesknowledge and skills were assessed by administering the tool which is designed by IAP. The Written Pre-Test was given to all the participants and Performance evaluation Pre-course was taken by each trainers by using simulators from all the participants. The workshop was divided into six sessions. Each session had a theory class, skill station and hands on skill by where the trainers demonstrated the skills and hands on training were provided by trainers to all the participants.

Outcome measures:

The primary outcome for the study was the proportion of resuscitation episodes in which appropriate Routine care , initial resuscitation steps, Breif ventilation and prolonged ventilation with bag and mask were practiced as recommended in the Indian Academy of Pediatrics, Neonatal resuscitation, First Golden Minute (IAP, NRP, FGM) project.

The primary outcome was further classified into two levels: Pretest and post test (knowledge) consisting of 20 items(20marks) and skill which covers the portion of 6 aspects (1. Preparation for birth , 2. Routine care 3.Initial steps, 4.Brief Ventilation, 5.Prolonged ventilation with normal heart rate and 6.Prolonged ventilation with slow heart rate) of Neonatal resuscitation training both for pre test and post test. Performance evaluation checklist (99.2 marks) covered the portion of 6 aspects of Neonatal resuscitation training. Scoring: 0 = Not Done 1 = Done incorrectly, incompletely, or out of order 2 = Done correctly in order. Scenario given to the participants was whether meconeum stained or not, baby is crying or breathing or not.

Ethics

The study was conducted with the permission of the hospital management to whom we explained the implications, purpose and voluntary nature of participation. Similar information was made available in written form to all labour ward and theatre staff and written informed consent was obtained from all health workers prior to their practice being observed. Ethical approval for the conduct of the study was obtained from the Institutional research review board of Symbiosis College of Nursing, Pune.

Results:

Table 1 : Description of samples based on their personal characteristics in terms of frequency and percentages

N=255.

Demographic variable	Frequency	Percentage
Age		
21 – 30 years	182	71.4%
31 – 40 years	65	25.5%
>40 years	8	3.1%
Gender		
Male	2	0.8%
Female	253	99.2%
Professional Qualification		
B. Sc. Nursing	100	39.2%
P.B. B.Sc. Nursing	25	9.8%
General Nursing and Midwifery	130	51.0%
Duration of clinical experience		
0 – 5 years	120	47.1%
6 – 10 years	100	39.2%
> 10 years	35	13.7%

Fig 1: Pre test knowledge pertaining to neonatal resuscitation programme among nurses
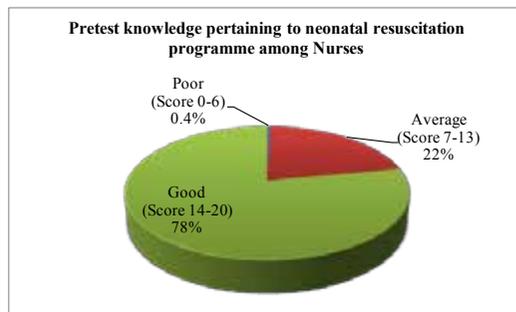

Fig 2: Pretest skill set pertaining to neonatal resuscitation programme among nurses
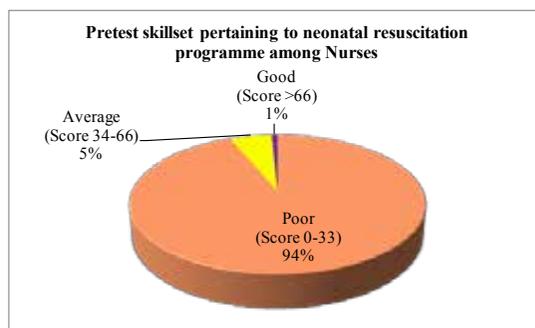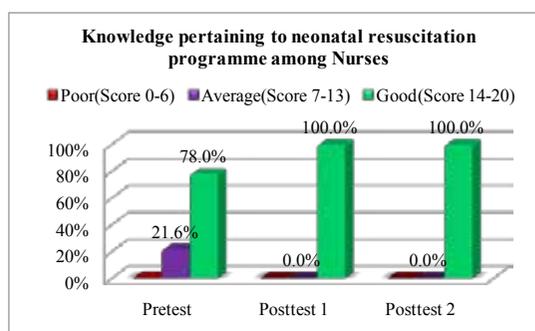

Fig 3: Knowledge pertaining to neonatal resuscitation programme among nurses

Researcher has applied paired t-test for comparison of pretest scores with posttest 1 and posttest 2 scores. p-values were of order of 0.000, which were small (less than 0.05), the null hypothesis is rejected. The knowledge of nurses improved immediately and 3 months after Neonatal resuscitation training course of one day duration.

Fig 4: Skill set pertaining to neonatal resuscitation programme among nurses
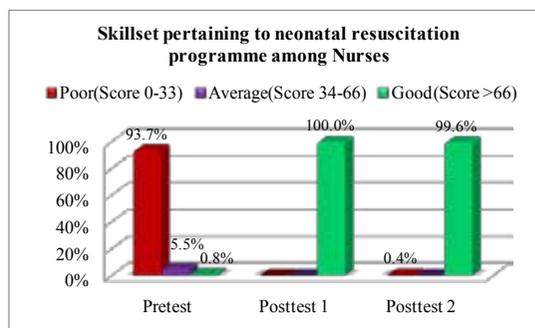
In pretest (Skill set), 93.7% of the nurses had poor skill set (Score 0-33 and only 0.8% of them had good skill set (score >66) regarding neonatal resuscitation program. In posttest1 (immediately) and 2 (3 months after training course), all of them had good skill set (Score >66). This indicates that there is remarkable improvement in the skill set of nurses after training course on Neonatal resuscitation.

Table 2: Comparison of pre test and post test scores
N=255

Admin	Mean	SD	t	Df	p-value
Pretest	12.4	12.7			
Posttest 1	90.2	5.1	20.5	254	0.000
Posttest 2	94.0	56.3	20.2	254	0.000

Researcher applied paired t-test for comparison of pretest scores with posttest 1 and posttest 2 scores. Average skillset score in pretest was 12.4 which increased to 90.2 in posttest1 and 94 in posttest 2. t-values for this comparison were 20.5 and 22.2 for comparison of pretest with posttest1 and posttest2 respectively. Corresponding p-values were of order of 0.000, which were small (less than 0.05), the null hypothesis is rejected. The skillset of nurses improved immediately and three months after Neonatal resuscitation training course of one day duration.

Discussion:
We attempted to undertake a simple randomized technique to assess the effect of a simple one day newborn resuscitation training among staff nurses working in labour room and operation theatre. However, our criteria for randomization, aiming to ensure participants were present to be observed in a defined period from 8am to 5pm. The training intervention significantly improved the knowledge and performance of initial resuscitation steps, with 99% on Preparation of birth, routine care, initial steps, brief ventilation, and prolonged ventilation with normal and slow heart rate. In our study pretest (knowledge), 78% of the nurses had adequate knowledge (score 14-20) and in skill set, 93.7% of the nurses had poor skill set (Score 0-33), regarding neonatal resuscitation program.In posttest 1 and II   (immediately after the training and after 3 months training), all of the participants hadadequate knowledge (score 14-20). In posttest 1 (immediately after the training), all of them had good knowledge (score 14-20) and in skill set also the participants had good performance. This shows that there is remarkable improvement in the knowledge and skill set among nurses regarding Neonatal resuscitation after training course.

Previous studies demonstrate that both resuscitation skills and knowledge are poor in health care professionals, despite frequent exposure to situations in which both are needed[6, 8.] Worldwide, there is now extensive consensus on how newborn resuscitation should be provided[9] and it is proved that 95 % of the new requires only a minimum of equipment during resuscitation without access to intensive care skills or facilities [10, 11.] Recent research studies have reinforced this opinion demonstrating that suction in the presence of meconium and the use of oxygen are in most newborns unnecessary[12,13,14,15.] These studies are have relevant to our study as present study also focused to use only a minimum of equipment during resuscitation without access to intensive care skills or facilities like laryngoscope, oxygen etc. In our study clinical impact from our intervention, 99.6% of nurses had adequate knowledge and skill set immediately and three months after the training.

Other study stated that simple immediate neonate assessment and warming, drying and tactile stimulation is the first step of neonatal resuscitation and was estimated by experts to result in a small (10%) reduction in intrapartum-related and preterm

deaths. In primary health centers limited settings, these simple initial steps will be easy to perform even family members or primary health care providers – for example, rubbing the baby, dry with a cloth– and might save lives, but this is expected to have limited effect. Observational studies suggest that between 6-42% of newborns who do not breathe at birth require ventilation[16, 17, 18,] indicating that the majority of non-breathing babies may respond to simple steps alone. Even our study also focused on minimal equipment will be sufficient for neonatal resuscitation.

Two community based studies proved that, stillbirth rate is reduced after training programs including bag-mask resuscitation[19.] A live newborn with severe neonatal depression is difficult to differentiate from a stillborn, and there is the potential for misclassification in low-resource settings where newborns are not typically assessed for signs of life at birth [20,21.] Training on neonatal assessment and resuscitation will reduce the misclassification and increase survivalrate in apparently stillborn newborns. Among apparently stillbirth newborns who were resuscitated, case fatality ranges between 16-65% in high income settings[22, 23,] with major intensive care support, and long term outcomes that are significantly worse than for resuscitated babies who did have a heart rate detected[25.]These findings emphasize the need to accurately count stillbirths and assess long term outcomes to capture the full impact of obstetric and immediate newborn care interventions.

Conclusion: In conclusion, our findings suggest that implementation of a simple one day newborn resuscitation training can be followed by significant, long-term improvement in health workers' practices.

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