



**Effectiveness of Helping Babies Breath - Simulation training on knowledge and skills of nurses working in selected BBMP maternity hospitals**

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**Abstract**

Resuscitation of newborns is more often needed in developing countries than in developed. However, most newborns do not at present receive adequate care because most birth attendants do not have the necessary knowledge, skills and equipment to help them. In resource poor areas, pediatricians are rarely available to attend emergency deliveries and only nursing staffs are available to do neonatal resuscitation. Hence the nurse should anticipate the need for resuscitation, skilled in basic newborn resuscitation, including preparation, timely recognition and quick corrective action.

**Method:** A Quasi experimental pre and post- test control group design was adopted for the study. The study variables are knowledge and skill on neonatal resuscitation among nurses. The study was conducted in BBMP maternity hospitals (South and west Zone), Bangalore. 60 samples [30 in experimental and 30 in control group] were selected by using simple random sampling technique. Data was collected by using

Structured questionnaire to assess the knowledge on neonatal resuscitation for both the group. The competency(skills) assessment for the nurses was conducted through clinical simulation using Neo Natalie new-born simulator. Each nurse skills were recorded on observational checklist as they perform the task on the mannequin. On the same day, simulation training on neonatal resuscitation is delivered to experimental group by using simulation neonatal resuscitation mannequin (neo-Natalie) in four sessions, each lasting for 30 – 40 minutes on single day.

**Results:** The study results revealed that most of the nurses in the experimental group had moderate knowledge (80%) and poor skills (93.3%) prior to implementation of intervention. Similarly, nurses in control group had adequate knowledge (50%) and poor skills (53.3%). After the implementation of Helping Babies Breath simulation training, after the implementation of Helping Babies Breath simulation training, highly significant improvement was observed in

experimental group with relation to knowledge (P=0.001) and skills(P=0.001). In the control group, no significant changes were observed with regard to knowledge (p=0.822) and skill (p=0.417) on neonatal resuscitation). There was no significant association was found between socio-demographic variables and pre-test level of knowledge and skills regarding neonatal resuscitation in the experimental group

**Keywords:** HBB (Hhelping Babies Breath), WHO (World Health Organisation, UNICEF (United Nations International Children's Emergency Fund), BBMP (Bruhat Bengaluru Mahanagara Palike)

### **Introduction**

According to WHO, the incidence of birth asphyxia is higher in developing countries than in developed because of a higher prevalence of risk factors, namely: women are in poor health when they become pregnant; the incidence of pregnancy and delivery complications in these women is high; care during labour and delivery is often inadequate or non-existent; and about 10% of infants are estimated to be born preterm. Thus, resuscitation of new-borns is more often needed in developing countries than in developed. However, most new-borns do not at present receive adequate care because most birth attendants do not have the necessary knowledge, skills and equipment to help them. Nevertheless, there is one single intervention for dealing with asphyxia when it occurs - resuscitation. The need for resuscitation can sometimes be predicted though very often it cannot. Therefore, every birth attendant must be both skilled and equipped to resuscitate new-borns who do not start breathing spontaneously. The approach should be feasible even where resources are limited<sup>5</sup>.

In resource poor areas, pediatricians are rarely available to attend emergency deliveries and only nursing staffs are

available to do neonatal resuscitation. Hence the nurse should anticipate the need for resuscitation, skilled in basic new-born resuscitation, including preparation, timely recognition and quick corrective action.<sup>5</sup>

The HBB simulation training is based on the latest available scientific evidence and is immensely useful in decreasing the neonatal mortality in the state and mainly focused on teaching simple approach to resuscitation and practical scenario sessions using new-born resuscitation mannequin to develop skills in rapid assessment & routine care of new born, initial steps of resuscitation and use of a bag-mask device. The training will be divided into four sessions. Each session will have a theory class and hands on skill training for performing neonatal resuscitation which includes preparation for birth, Routine care for new born, initial steps of resuscitation and bag & mask ventilation.

### **Objectives**

- To assess the existing knowledge and skills pertaining to neonatal resuscitation among nurses working in selected BBMP maternity hospitals, Bangalore
- To assess the knowledge and skills regarding neonatal resuscitation among nurses, before and after implementation of “Helping Babies Breath” simulation training programme.
- To find relationship between socio-demographic variables of nurses and knowledge and skills regarding neonatal resuscitation, before implementation of helping babies breath simulation training programme.

### **Materials and method**

A quasi-experimental pre-test and post- test design was adopted for the study. The study variables were knowledge and skills on neonatal resuscitation among nurses. The study was conducted in BBMP maternity

hospitals (South and west Zone), Bangalore. 60 samples [30 in experimental and 30 in control group] were selected by using simple random sampling technique. The nurses who attended deliveries or provided care to new-born babies in BBMP maternity hospitals were included for the study and nurses who attended simulation training on neonatal resuscitation in the last 6 months were excluded from the study.

**Data collection procedure**

After obtaining the Institutional ethical clearance, formal permission was obtained from the concerned authorities of BBMP Maternity Hospitals in Bangalore. Simple random sampling technique was used to assign BBMP maternity hospitals (South and west Zone) as experimental and control group and each BBMP maternity hospitals were visited by the investigators and study subjects were recruited by convenient sampling. Informed consent was obtained and socio demographic variables are collected from the subjects in their respective maternity hospital. Structured questionnaire was administered to assess the knowledge on neonatal resuscitation for both the group. Average 25-30 minutes taken by subjects to complete the questionnaire.

The competency (skills) assessment for the nurses was conducted through clinical simulation using Neo Natalie new-born simulator. Each nurse skills were recorded on observational checklist as they perform the task on the mannequin. On an average 10-15 minutes was taken by each subject to perform resuscitation procedure. On the same day, simulation training on neonatal resuscitation is delivered to experimental group by using simulation neonatal resuscitation mannequin (neo-Natalie) in four sessions, each lasting for 30 – 40 minutes on single day. On an average 3-4 nurses were trained per day. The simulation training comprised of 1 hour teaching and 2

hrs. practical. The training covered 4 main lessons i) preparation for birth ii) routine new born care iii) initial steps of resuscitation and iv) bag and mask ventilation. After 7 days, post-test was conducted to the both the groups to evaluate the knowledge and skills on neonatal resuscitation.

**Statistical analysis**

The data were analyzed using SPSS (20-version), descriptive statistics (frequency tables, mean (± standard deviation), and inferential statistics (Independent t-test and Chi-square). The level of significance was P < 0.05.

**Results**

The collected data were analyzed according to the objectives and hypothesis of study. The findings are presented below.

Table 1: Demographic characteristics of staff nurses in experimental and control group n= 60 (30 + 30).

Sn.	Demographic Variables	Experimental		Control		P value	
		Mean	SD	Mean	SD		
1	Age in years	38.23	9.44	34.63	9.50	0.165	
2	Years of working experience	12.50	8.11	9.87	8.15	0.161	
3	Average number of deliveries conducted or assisted per month	21.50	17.02	21.10	11.11	0.173	
4	Gender	F	%	F	%	0.062	
		Male	3	10	7		23.3
		Female	27	90	23		76.7
5	Professional qualification						

General Nursing and Midwifery (GNM)	30	100	30	100	-
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Table 1 shows that the mean age of staff nurses in experimental group was 38.23 (SD- 9.44) and control group was 34.63 (SD-9.50) and 27 (90%) of them were females. With respect to educational status, all 60 (100%) of them were qualified with General Nursing and Midwifery (GNM). In relation to Years of working experience, the average mean of working experience in experimental group was 12.50 (SD- 8.11) and control group was 9.87 (SD- 8.15). In regard to mean of Average number of deliveries conducted or assisted per month in experimental group was 21.50 (SD-17.02) and control group was 21.10 (SD- 11.11).

The Fig-1 shows that, most of the nurses (exp. group) had moderate knowledge (80%) and nurses in control group had adequate knowledge (50%). With regard to skills on neonatal resuscitation nurses (exp. group) had poor skills (93.3%) prior to implementation of intervention and 53.3% of nurses in the control group had poor skills. After the implementation of Helping Babies Breath simulation training, most of the nurses (Exp. group) had moderately adequate knowledge (93.3%) and no significant changes were observed among nurses (control group) with regard to knowledge (Fig -3). Majority of the nurses (93.3%) had average skills in the exp. group (Fig-4) whereas, no significant improvement was observed among nurses in the control group

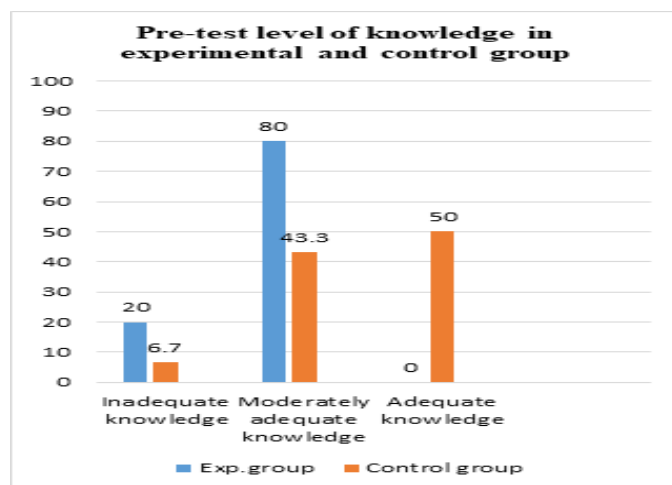


Fig.1: Pre-test level of knowledge in experimental and control group.

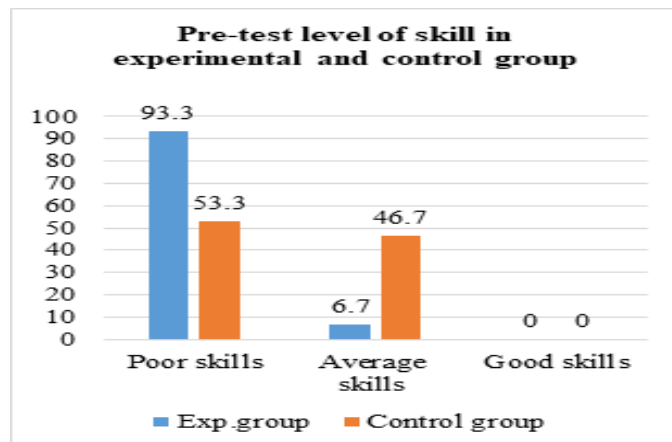


Fig. 2: Pre-test level of skill in experimental and control group.

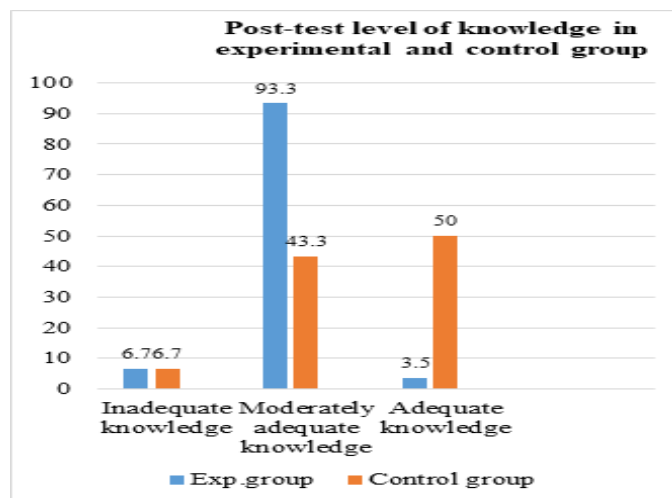


Fig. 3: Post-test level of knowledge in experimental and control group

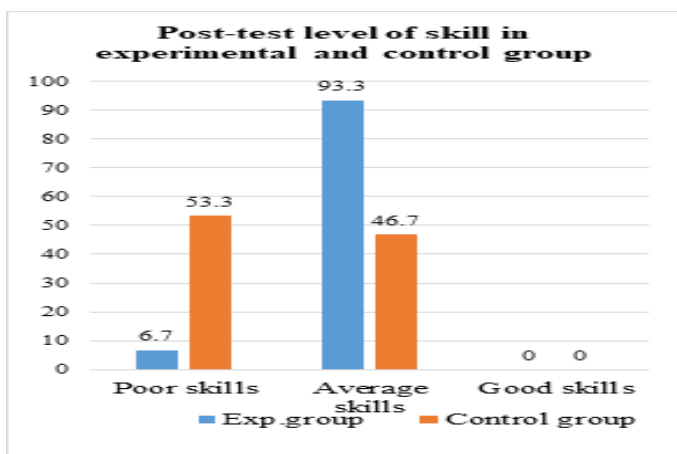


Fig. 4: Post-test level of skills in experimental and control group.

Table 2: Comparison between mean pretest and post-test scores of experimental and control group subjects for knowledge and skills regarding neonatal resuscitation. n= 60 (30+ 30)

Variables	Total score	Pre test	Post test	t -test	P - value
Exp. group		Mean (SD)	Mean (SD)		
Knowledge	30	15.03 (4.23)	26.13 (2.33)	t= 12.570 df= 58	< 0.001**
Skill	64	13.47(4.74)	51.80(5.92)	t= 27.68 df= 58	< 0.001**
Control group					
Knowledge	30	19.33(4.79)	19.60(4.35)	t= 0.226 df=58	0.822
Skill	64	20.73 (7.36)	22.27(7.15)	t= 0.818 df=58	0.417

\*Statistically significant values (P < 0.05)

\*\*statistically significant values (P<0.01)

Table 3: Comparison between mean post-test scores of experimental and control group subjects for knowledge and skills regarding neonatal resuscitation. n= 60 (30+ 30)

Variables	Total score	Post test	t -test	P value
Knowledge		Mean (SD)		
Exp. group	30	26.13 (2.33)	t= 7.249 d= 58	< 0.001**
Control group		19.60(4.35)		
Skill				
Exp. group	64	51.80(5.92)	t= 17.41 d=58	< 0.001**
Control group		22.27(7.15)		

\*Statistically significant values (P < 0.05)

\*\*statistically significant values (P<0.01)

The table 2&3 depicts that, after the implementation of Helping Babies Breath simulation training, highly significant improvement was observed in experimental group with relation to knowledge (P=0.001) and skills(P=0.001). In the control group, no significant changes were observed with regard to knowledge and skill on neonatal resuscitation.

Table 4.1: Relationship between socio-demographic variables and pre-test level of knowledge and skills regarding neonatal resuscitation (Experimental group) n= 30

Socio-demographic variables	Inadequate knowledge	Moderately adequate knowledge	Chi square	P value
Age in years			2.722 df= 2	0.256
20–30 years	4	9		
31–40 years	1	2		
41years and above	1	13		
Gender			.833 df= 1	0.361
Male	0	3		
Female	6	21		

Years of working experience			2.177 df= 2	0.337
< 1 years	2	5		
>1- 3 years	3	7		
>3 years	1	12		
No. of deliveries conducted or assisted per month			3.849 df= 2	0.146
≤20 deliveries/ month	5	14		
>20-39 deliveries/ month	1	1		
≥40 deliveries/ month	0	9		

Table 4. 2: Relationship between socio-demographic variables and pre-test level of skills regarding neonatal resuscitation. n= 30

Socio-demographic variables	Poor skills	Average skills	Chi square	P value
Age in years			2.449 df= 2	0.294
20–30 years	13	0		
31–40 years	3	0		
41years and above	12	2		
Gender			0.238	0.626
Male	3	0	df= 1	
Female	25	2		
Years of working experience			2.802	0.246
< 1 years	7	0	df= 2	
>1- 3 years	10	0		
>3 years	11	2		
No. of deliveries conducted or assisted per month			5.000	0.082
≤20 deliveries/	19	0	df= 2	

month				
>20-39 deliveries/ month	2	0		
≥40 deliveries/ month	7	2		

\*Association is significant at the 0.05 level (2-tailed)

\*\*Association is significant at the 0.01 level (2-tailed)

The Table (4.1&4.2) reveals that, there was no significant relationship between socio-demographic variables and pre-test level of knowledge and skills regarding neonatal resuscitation.

### Discussion

The major findings of the study shows that nurses in the experimental group had moderate knowledge (80%) and poor skill (93.3%) prior to implementation of intervention. After the implementation of Helping Babies Breath simulation training, majority of the nurses (exp. group) gained moderately adequate knowledge (93.3%) and developed average skills (93.3%).

The hypothesis (H<sub>1</sub>) predicted that the staff nurses receiving helping babies breath simulation training programme, demonstrates increase levels of knowledge and skills on neonatal resuscitation than those who will not receive simulation training programme. This hypothesis was supported by study result which shows that knowledge and skill scores increased significantly after the intervention (P=0.001\*\*), from 15.03 ± 4.23 to 26.13 ± 2.33 and 13.47± 4.74 to 51.80 ± 5.92 respectively. Hence, research hypothesis(H<sub>1</sub>) is accepted. The study findings are consistent with the study conducted by Masumah H et al. (2020), who found that knowledge and skill scores increased significantly immediately after the resuscitation training (P < 0.001),

from  $5.05 \pm 2.07$  (out of 12) to  $10.17 \pm 1.31$  and  $18.90 \pm 3.14$  to  $68.45 \pm 2.05$  respectively.

### Limitations

The present study assessed only short-term effect of the intervention. Follow up assessment of dependent variables after 6 and 12 months would help to know the long-term effect of intervention.

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