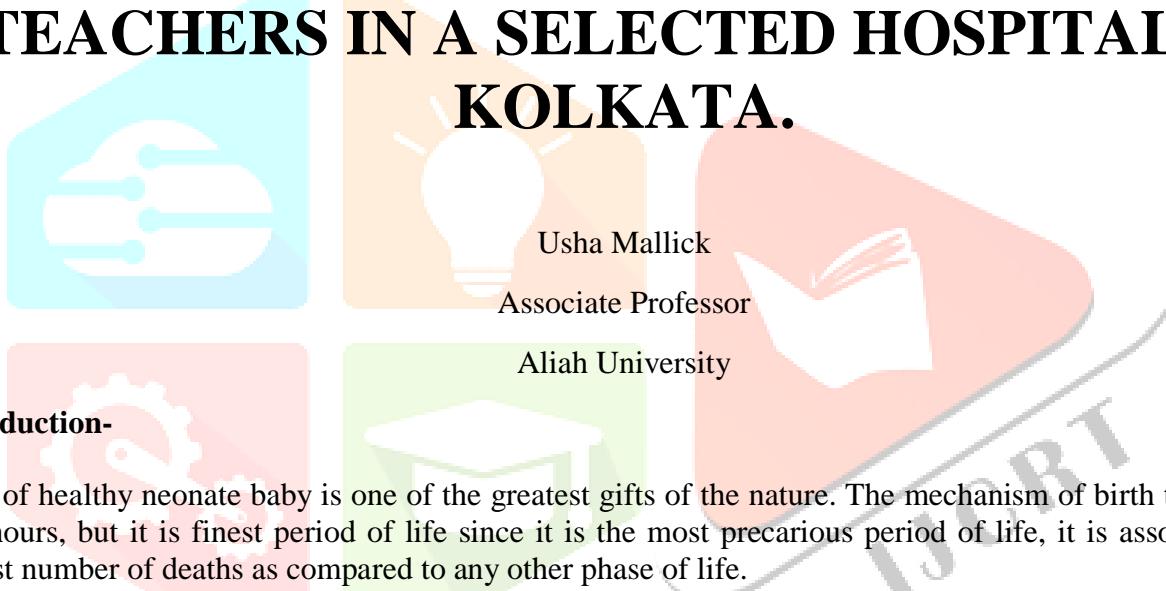# A PRE-EXPERIMENTAL STUDY TO ASSESS THE EFFECTIVENESS OF SIMULATION BASED TEACHING ON KNOWLEDGE AND PRACTICES REGARDING NEONATAL RESUSCITATION AMONG THE NURSING TEACHERS IN A SELECTED HOSPITAL IN KOLKATA.

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Introduction-

Birth of healthy neonate baby is one of the greatest gifts of the nature. The mechanism of birth takes only a few hours, but it is finest period of life since it is the most precarious period of life, it is associated with largest number of deaths as compared to any other phase of life.

A newborn is precious not only to his parents but also to community, nation and to the world. The maintenance of child health is not only desired but also positively valued by every society and improved level of child health is the accepted goal of all communities "A healthy child has a sure future" is one of the themes of WHO.

Every birth must be considered as medical emergency and labor room must be provided with adequate infrastructure and facilities for resuscitation of babies who fail to establish Spontaneous breathing. Prenatal hypoxia is one of the leading causes of prenatal mortality in developing countries. Most babies have a smooth transition from fetal to neonatal life and they are able to establish spontaneous breathing without any assistance. But 5.0-7.5% of neonates are likely to face difficulties in initiating spontaneous breathing at birth and they need active resuscitation. Every nurse must have the training and expertise to resuscitation an apneic or asphyxiated newborn baby.

Neonatal resuscitation skills are essential for all health care providers who are involved in the delivery of newborns. The transition from fetus to newborn requires intervention by a skilled person or individual. About 90% of neonates successfully make transition without any help. The remaining 10% of newborns require some assistance to being breathing at birth and 1% or more require intensive resuscitative effort.

Simulation-based clinical education is a useful pedagogical approach that provides nursing students with opportunities to practice their clinical and decision-making skills through varied real-life situational experiences, without compromising the patient's well-being.

Simulation-based learning integrates cognitive, technical, and behavioural skills into an environment where learners believe the setting is real, act as they would responding in the field, and feel safe to make mistakes for the purpose of learning from them.

The use of human patient simulation as an instructional strategy can enhance patient safety and optimize outcomes, providing a means of allowing nursing students to "practice" critical thinking, clinical decision making, and psychomotor skills in a safe, controlled environment, without potential risk to a live patient.

Critical situations can be investigated without risk. It is cost effective. Simulations can be sped up so behaviour can be studied easily over a long period of time. Simulations can be slowed down to study behaviour more closely.

Need of the Study

In nursing, there is limited research on the effectiveness and outcomes when using simulators and simulations. In healthcare the emphasis is on giving accurate and safe care to patients, and simulators and simulations allow for the practice of this important goal in a less threatening environment. In 2003, the National League of Nurses (NLN) endorsed the use of simulations in order to prepare students in critical thinking and self-reflection as well as preparing them for the complex clinical environment [6]. Simulation teaching ability to increase critical thinking and knowledge retention by using an active, student-cantered method of education. Simulation allows the learner to bring their existing knowledge and build on it, and use debriefing and reflection to contribute to a deeper understanding. Simulation has proven to be effective in improving teamwork, increasing communication, and is an innovative pedagogical approach. It has been demonstrated that there is a high level of student satisfaction with this type of training. Successful implementation of high-fidelity simulation in the medical and nursing fields has contributed to the saving of many lives. 3. Review of Literature Neonatal deaths are the major obstacles for the improvement of survival of under five children in developing countries. An estimated 4 million babies die in the neonatal period yearly and approximately all of these deaths occur in low- and middle-income countries.[2,3] The need for information on neonatal deaths is increasing because of an increase in the percentage of mortality with a current report of about 40% of global under-five mortality occurs in the neonatal period.[4]

World Health Organization defined birth asphyxia as failure to initiate and sustain breathing at birth. Every new born should be considered at a high risk of birth asphyxia since most cases of asphyxia cannot be predicted. Although neonatal death is multifactorial, the most important single causes of neonatal deaths were preterm birth, birth asphyxia, sepsis and pneumonia. According to 2012 UN inter-agency group report for child mortality estimation, slower reductions in neonatal mortality than in under-five mortality were seen in all regions over the past 22 years.

Problem statement –

A Pre-Experimental study to assess the effectiveness of Simulation based teaching on knowledge and practices regarding Neonatal Resuscitation among the Nursing teachers in a selected hospital in Kolkata.

Purposes - To explore the influence of simulation-based teaching in developing knowledge and practices among the nursing teachers on neonatal resuscitation.

Objectives –

To assess the level of knowledge regarding neonatal resuscitation among the nursing teachers

To assess the practice of neonatal resuscitation among the nursing teachers

To determine the co-relation between the knowledge and practices

To assess the effectiveness of simulation-based teaching regarding neonatal resuscitation.

Operational definitions-

Simulation based teaching - A simulation is based on a representation of a model that imitates a. real-world process or system.

Neonatal Resuscitation - It is intervention after a baby is born to help it breathe and to help its heart beat.

Effectiveness – It is the power to bring the changes in knowledge and practice score among the nursing teachers.

Nursing Teachers- Nursing personals involved in teaching in different nursing school and colleges

Hypothesis –

$H0_1$- There is no significant improvement in knowledge regarding neonatal resuscitation after administration of simulation-based teaching

$H0_2$- There is no significant improvement in practice regarding neonatal resuscitation after administration of simulation-based teaching

$H0_3$- There is no correlation between knowledge and practices among the nursing teachers

Review of Literature:

The present study is almost similar to the following studies-

1.   Tenorio V, Alascon A, Area G, Camprubim (2012) Conducted a retrospective study on effect of whole-body hypothermia on patients with moderate severe hypoxic ischemic encephalopathy (HIE) in Barcelona, result of the study revealed that no potentially severe complications related to hypothermia were observed. Seven patients (35%) died; all of them with severe HIE. No potentially severe complication related to it was recorded.

2.   Ever A, et. Al (2012) conducted a prospective control study to assess substandard care factors in the case of delivery related asphyxia on term infants, without congenital malformations who died intrapartum of were admitted due to asphyxia in Netherlands. The study results revealed that in 58% cases a substandard care factor was identified that was possibly or probably related to prenatal deaths or neonatal unit admission.

3.   Sabir H, Jary S, Tooley J, Liu X, Thorlsen M (2012) did on conducted a descriptive study to assess whether increased inspired oxygen and levocardia during the first 6 hours of life are associated with adverse outcome at 18 months in term neonates treated with therapeutic hypothermia in United Kingdom/ result of the study shows that increased fraction of inspired oxygen with in the first 6 hours of life was significantly associated with adverse outcome in newborn treated with therapeutic hypothermia following hypoxic ischemic encephalopathy.

4.   Huo L, Zhang F et. al (2011) criticized a study on the early diagnose of hypoxic ischemic encephalopathy in the new born by fuzzy back- propagation neural network, with a clinical compressive indicator, exhibited a high accuracy for the early diagnose of hypoxic ischemic encephalopathy.00

5.   Neogi SB (2011) Examine a cross sectional study to assess the functioning of special care newborn units in India. Result of the study shows that the case fatality rate reduces from 40% to 4% within one year

of their functioning and proportional mortality due to sepsis and low birth weight declined significantly over 2 year due to quality of care provided by these units.

6.   Ferrari F, et. al (2011) examined a co-relational study to co-relate the site and severity of brain lesions seen on magnetic resonance imaging with the quality of general movements in term infants with hypoxic ischemic encephalopathy and compare the prognostic value of general movements and MRI scores were 100% sensitive and 72.2% specific for motor outcome and cramped synchronized general movements were 100% specific and 68% sensitive for motor outcome. In term infants with HIE, the site and severity of brain lesions on early MRI are highly co-related with general movements.

Research methodology –

Research Approach – In view of the nature of the problems selected for the study and objectives to be accomplished, an evaluative research approach was considered as appropriate for the present study.

Research Design – Depending upon the purpose of the study, research approach and variables to be studied. Pre experimental one group pretest and posttest design was adopted for this study.

Setting of the study – A Corporate Hospital of Kolkata was selected for the study

Population – In the present study, population was consisted of Nursing teachers who were working in different Private and Govt Hospitals in West Bengal.

Sample – Sample consisted of the population selected to participate in a research study. In the present study, the sample consisted of 50 teachers who were working in different Nursing Schools and Colleges in Kolkata.

Sampling technique –In the present study, non probability convenient sampling technique was used.

Ethical permission was taken from the Hospital authority.

Tools and Techniques used in the Study -

Sec -I – Consisted of demographic variables which included age, religion, marital Status, professional qualification, Experience.

Sec -II – Consisted of structured multiple-choice questions related to different aspects of neonatal resuscitation to assess the knowledge of nursing teachers. Total numbers of items were 20. Each item carries 2 marks, total marks 40

Sec -III – Evaluating the practices of neonatal resuscitation, an observational checklist was made. Total steps of the observational checklist were 20. Every steps of the checklist were consisting 2 marks. total marks 40.

Validity - The tool was validated by Five experts. The percentage of agreement was 95%

Reliability –Reliability of questionnaire is done by Kuder Richardson Method. Reliability co-efficient of internal consistency is 0.79

Reliability of observation check list is done by interrater method. Reliability co-efficient of equivalence is 0.90%.

Data collection procedure-

- After self-introduction, purpose of the study was explained.
- Consent was taken from the respondents
- Pretest was taken by the structured multiple-choice questions.
- Time was allotted for 30 minutes for pretest.
- Resuscitation procedure was assessed through observational checklist.
- Simulation based teaching administered on neonatal resuscitation
- Posttest was taken after 12 days of the simulation-based teaching.

Major findings of the study-

All collected data were analyzed by using descriptive and inferential statistics.

Section -I – Findings related to demographic variables

In regard to age, 36 (72%) majority of the samples were in the age group of above 30.

In relation to gender, 50(100%) of the samples were female

In regard to marriage, 32 (64%) of the samples were married.

In regards to professional qualification 40(80%) of the samples completed their M.Sc. in Nursing

In relation to experiences, 36(72%) of the samples had experience in teaching more than 10 years

In regards to organization, 38(76%) of the samples were belong to Private sector.

Sec-II – Findings related to assessment of knowledge.

Table 1 Frequency and percentage distribution of subjects according to their achieving of knowledge score in pretest and post test

n=50

Knowledge Score	Frequency pre test	Percentage of Pre test	Frequency post test	Percentage Post test
2-10	2	4%	0	0
12-20	10	20%	2	4%
22-30	26	52%	16	32%
32-40	12	24%	32	64%

Table1 illustrated that majority of the respondents 26(52%) scored between (22-30) in pre-test. Majority of the respondents 32(64%) scored between (32-40) in post -test.

Table2 Mean, mean difference, SD and paired 't' taste value showing pre-test and post-test knowledge scores of the nursing teacher

n=50

test	Max score	mean	Mean difference	SD_D	SE_{MD}	't' Value
Pre-test	40	24.36	14,04	5.47	0.875	24.12
Post- test	40	38.40				

Data presented in table 2 shown that mean of post test knowledge score of Nursing teachers is higher than the mean of pretest knowledge scores of nursing teachers. The 't' value was found statistically significant as evident from 't' value 24.12 at 0.05 level of significance.

Sec-III – Findings related to assessment of practice

Table 3 Frequency and percentage distribution of subjects according to their achieving of practice score in pretest and post test

Practice	Frequency pre test	Percentage of Pre test	Frequency post test	Percentage Post test
2-10	2	4%	0	0
12-20	10	20%	2	4%
22-30	26	52%	16	32%
32-40	12	24%	32	64%

Table3 illustrated that majority of the respondents 26(52%) scored between (22-30) in pretest. Majority of the respondents 32(64%) scored between (32-40) in posttest.

Table 4 Mean, Mean Difference, SD and paired 't' test value showing pretest and post test practice score of the Nursing teachers

n=50

Test	Max score	Mean	Mean difference	SD_D	SE_{MD}	't' Value
Pre-test	40	28.36	7.88	3.77	0.784	42.12
Post- test	40	36.24				

Data predicted in table 3 shown that mean of post test knowledge scores of Nursing teachers is higher than the mean of pretest practice scores of Nursing teachers. The 't' value was found statistically significant as evident from 't 'value 42.12 at 0.05 level of significance.

Table 5 Mean, SD, Correlation between the knowledge and practices among the Nursing teachers related to neonatal resuscitation.   n=50

Test	Knowledge		Practice	
	Mean	SD	Mean	SD
Pre-test	24.36	9.87	28.36	7.04
Post-test	38.40	4.40	36.24	3.27

S=Significance p<0.05

The Correlation value of knowledge and practice r= 0.63, 0.47 showed that there was statistically high positive significant relationship between knowledge and practices among the Nursing teachers.

Discussion –

The present study showed that majority of the respondents 26(52%) scored between (22-30) in pre-test. Majority of the respondents 32(64%) scored between (32-40) in post -test. that majority of the respondents 26(52%) scored between (22-30) in pre-test. Majority of the respondents 32(64%) scored between (32-40) in post-test.

Findings of the present study showed that post test mean knowledge score regarding neonatal resuscitation is much higher than the pretest. Regarding practices. the posttest mean practice score was higher than the pretest. It was observed in the present study that there was significant relationship between knowledge and practices among the nursing teachers related to neonatal resuscitation.

 Implication – This study can be implicated in the following field.

Nursing Administration – Nursing Administration can make a policy to make it mandatory that every nursing teachers attached with paediatric nursing care must have knowledge about neonatal resuscitation.

Nursing Practice – Nurses are always working as a front-line health care professional. Neonatal mortality is a biggest health care quality indicator. For updating the knowledge of the nurses, simulation-based teaching for every nursing procedure is utmost important.

Nursing Research – More emphasis should be laid on research in this area of practicing simulation-based teaching

Nursing Education – every nursing teachers should emphasize the concept of more involvement of every nursing procedure through simulation-based teaching for themselves and for their students.

Limitations –

Sample size relatively small, so its findings could not be generalized

The assessment of knowledge and practices were for limited time

Recommendations –

On the basis of the study, the Investigator offers the following recommendations for future research.

A similar study can be replicated with a larger sample for making generalization of the study.

A similar study can be performed with other nursing professionals apart from the nursing teachers.

The study can be performed to assess the nurse's attitude towards the simulation-based teaching by using liker scale.

Conclusion- Nurses should be always prepared to deliver new born resuscitation. Poor knowledge and poor skill regarding new born resuscitation among nurses can be a leading cause of neonatal mortality. New-born 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 new born resuscitation is required to improve the knowledge and skill of new born resuscitation hence they can provide new born resuscitation in correct way and that will be helpful in reducing the mortality and morbidity related to neonatal asphyxia. On the basis of the findings of present study, the following calculations can be drawn that simulation-based teaching had been proved to be very effective in developing knowledge and practices among the nursing teachers related to neonatal resuscitation.

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