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Newborn Care: Effectiveness of Simulation Training for Staff Nurses

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Abstract---A neonate is also called a newborn. Aim: To assess the effectiveness of simulation training on knowledge and practice regarding newborn care among staff nurses. Research design: A quasi experimental non randomized control group design was used. Sampling and sampling technique: Sixty staff nurses each in experimental and control group were selected by non probability purposive sampling for the study in Rohilkhand Medical college hospital and Varunarjun Medical College Hospital. Knowledge and practice was assessed by using structured knowledge questionnaire and practice checklist. The intervention included the simulation training of neonatal resuscitation and teaching on immediate and routine newborn care. Results and findings: The study findings revealed that the mean post-test knowledge score was higher i.e. (31.66±1.71) than the mean pretest knowledge score i.e. (20.68 ±4.68) in the experimental group. It revealed that the mean post-test practice score was higher i.e. (24.71±0.45) than the mean pretest practice score i.e. (21.03 ±1.30) in the experimental group. Data revealed that the mean experimental group knowledge score was higher (31.66±1.17) than the mean control group knowledge score (26.03 ± 3.66). The difference was found to be statistically significant at p=0.05 level of significance.

Keywords---hospital, neonate, newborn care, nurses, simulation training.

Introduction

The neonatal period, the first 28 days of life is the foremost vulnerable period of childhood . According to the World Health Organization, neonatal deaths account

for 45 percent of all deaths in children under the age of five. The majority of all neonatal deaths (75%) occurs during the first week of life and about 1 million newborns die within the first 24 hours (3). Simulation exchanges or amplifies real-world experiences with guided experiences that evoke or reproduce significant elements of the important world in a fully interactive manner. Simulation training has now become a crucial point of how training is structured and it deliver improved healthcare to patients. Feedback, intentional practice, outcome measurement, skill retention, and curriculum integration are all important aspects of simulation training (4).

Materials and Method

Research approach

In the present study Quantitative Approach was used

Research design

This study was a quasi experimental non randomized control group design.

Setting

The study was conducted at Rohilkhand Medical college hospital, Bareilly and Varunarjun Medical College Hospital, Shajahnpur.

Population

Staff nurses who are working in Rohilkhand Medical college hospital, Bareilly and Varunarjun Medical College Hospital, Shajahnpur.

Sample

60 staff nurses each in experimental and control group who are working in NICU, pediatric ward and OPD

Sampling criteria

- Inclusion Criteria
 - Staff nurses willing to give informed consent
 - All the staff nurses working in NICU, PICU, Paediatric ward, Paediatric extension ward, Postnatal ward
- Exclusion Criteria
 - Staff nurses working who is not available on the time of study
 - Staff nurses who is not willing to give the informed consent

Data Collection tool

Data will be collected regarding knowledge and practices of newborn care. A structured questionnaire will be used to assess the knowledge and check list will

be used to assess the practice before and after simulation training regarding newborn care.

- Section A Demographic variable
- The demographic variable consist of age in years, marital status, religion, educational qualification experience, Source of information.
- Section B Structured knowledge questionnaire
It included the immediate and routine newborn care. It contain 40 items which include maintaining temperature, APGAR score, newborn care resuscitation, general care ,breast feeding, neonatal examination, danger sign of newborn, personal hygiene and parental education and follow up. The items were of multiple choice questions type with one correct answer. Each correct response marked of one score. Thus the maximum score was 40 and minimum score was zero.
Scoring: The scoring was classified into four levels: 0-10 score (inadequate knowledge) 0-25%, 11-20 score (fair knowledge) 26-50%, 21-30 score (good knowledge) 51-75%,31-40 score (very good knowledge) 76-100%.
- Section C Practice Checklist
25 statements of Practice checklist includes immediate newborn care and routine care of newborn with yes or no options. Thus the maximum score was 25 and minimum score was zero.
Scoring: The scoring was calculated by each statement response. It was classified into 3 point scale score 17-25 score (Good practices) 76-100%, 9-16 score (fair practices) 36-75%,0-8 score (Poor practices) 0-35%.

Content validity

The prepared research tool were distributed to 5 experts from child health Nursing , 1 biostatistician & 2 from doctors for content validation. The item level content validity index (CVIs) for demographic variable ranged from 0.95 to 0.8 & the scale level CVI using the averaging approach was 0.89. The item level content validity index (CVIs) for Structured knowledge Questionnaire ranged from 1 to 0.8 & the scale level CVI using the averaging approach was 0.87. The item level content validity index (CVIs) for Practice check list ranged from 1 to 0.8 & the scale level CVI using the averaging approach was 0.9. After consultation with supervisor modification in the tool was done and final tool was prepared.

Reliability of tool

The reliability of the tool was determined by split half method and r-value of structured knowledge questionnaire was 0.75 which shows tool is highly reliable.The r-value of practice checklist was 0.92. It shows that the item in the tool is highly reliable.

Pilot study

After obtaining formal permission , Keshlata Hospital and Sant hospital pilot study was conducted. The researcher selected 3 samples each from both experimental and control group by non probability purposive sampling technique.

Pilot study findings revealed the feasibility and practicability to conduct the main study.

Process of data collection

- PHASE 1-
The formal permission to conduct the study was obtained from Chairman, Rohilkhand Medical College and Hospital, Bareilly and VarunArjun Medical college and hospital , Shahjahanpur.
- PHASE 2-
Investigator introduced herself and developed rapport with subject. The investigator conducted pretest of the main study after getting consent from 60 samples who are selected by purposive sampling method at selected hospital in both experimental and control group .
- PHASE 3-
A validated structured questionnaire and a checklist was used to collect data about newborn care. 120 staff nurses were participated in study and then simulation training has been provided to experiemntal group and withheld from control group. After that as a post test. once again the questionnaire and practice scale of experimental and control group has been assessed.

Findings

Findings related to the evaluation of the effectiveness of simulation training on new born care in terms of knowledge and practice of staff nurses.

Objective 1: To assess the pre-test knowledge and practice regarding newborn care among staff nurses in experimental group

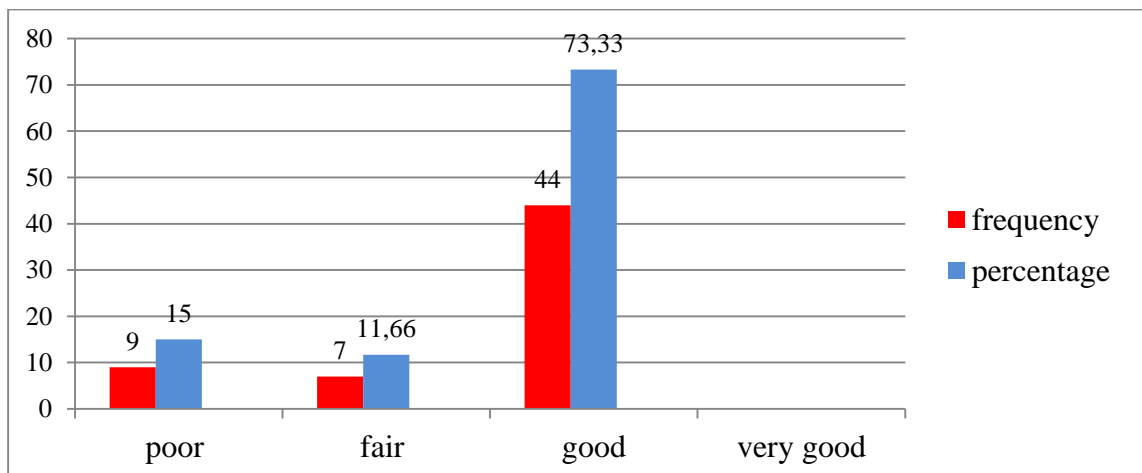


Figure 1. Frequency and Percentage distribution of pretest Knowledge score among staff nurses in experimental group

Figure 1 represented maximum 44(76.33%) staff nurses had good knowledge regarding newborn care before giving simulation training followed by 9(15%) staff

nurse had poor knowledge and remaining 7(11.66%) staff nurse had fair knowledge regarding newborn care.

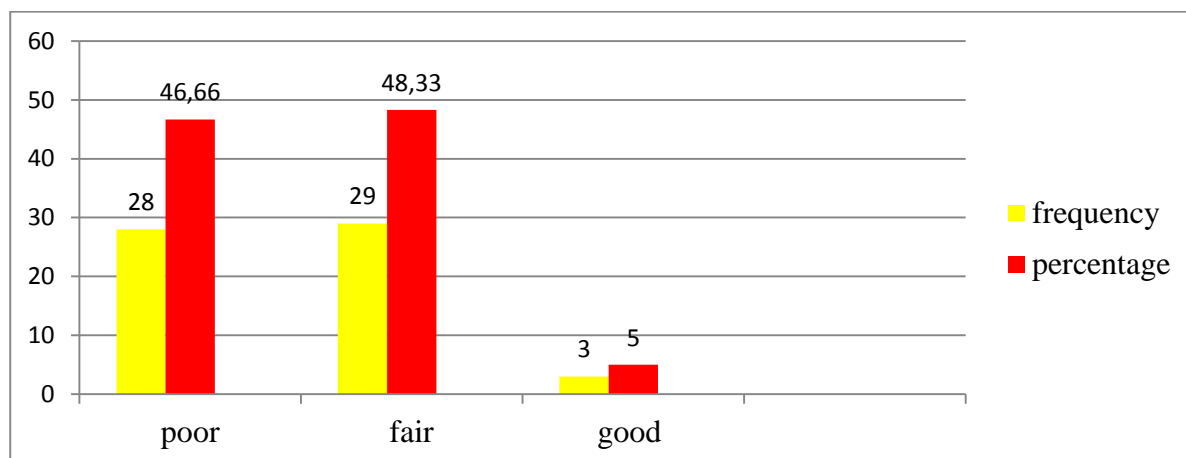


Figure 2. Frequency and Percentage distribution of pretest practice score among staff nurses in experimental group

Figure 2 represented maximum 29(48.33%) staff nurse had fair practice regarding newborn care before giving simulation training followed by 28(46.33) staff nurse had poor practice score and remaining 3(5%) staff nurse had good practice regarding newborn care.

Objective 2: To assess the pre-test knowledge and practice regarding newborn care among staff nurses in control group

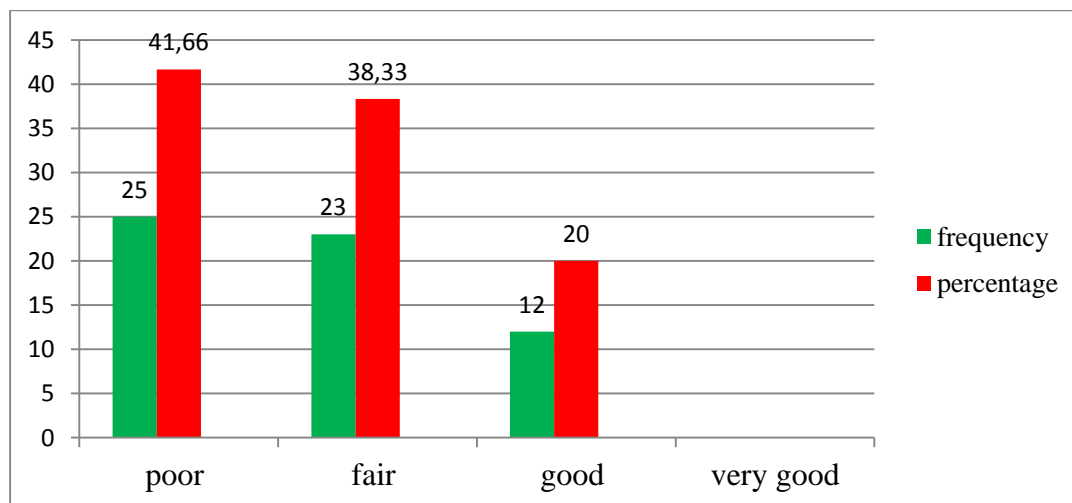


Figure 3. Frequency and Percentage distribution of pretest knowledge score among staff nurses in control group

Figure 3 indicated maximum 25(41.66%) staff nurses had poor knowledge regarding newborn care followed by 23(38.33%) staff nurses had fair knowledge and remaining 12(20%) staff nurse had good knowledge regarding newborn care.

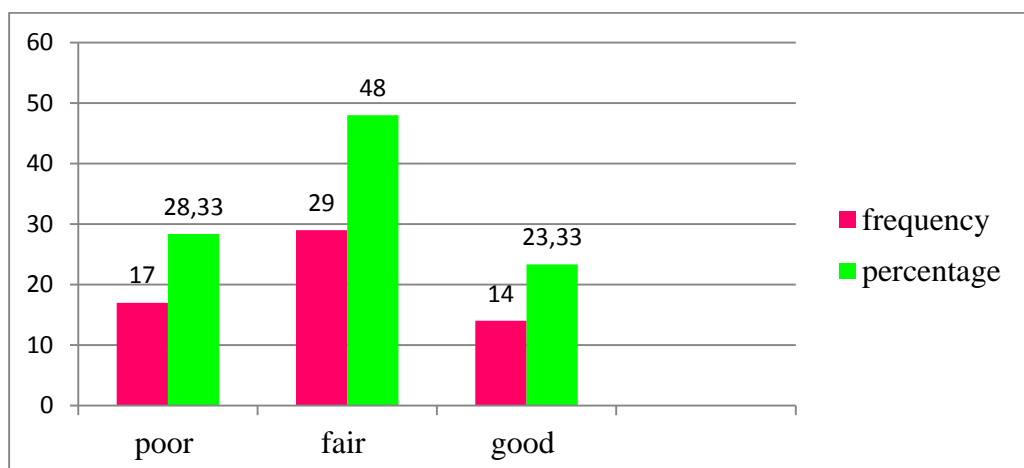


Figure 4. Frequency and Percentage distribution of pretest level of practice score among staff nurses in control group

Fig 4 indicated maximum 29(48%) staff nurse had fair level of practice regarding newborn care followed by 17(28.33%) staff nurses were had poor practice and remaining 14(23.33%) staff nurse had good practice regarding newborn care

Objective 3: To determine the effectiveness of simulation training programme in terms of change in knowledge and practice regarding newborn care among staff nurses in experimental group

Hypothesis (H1): There is a significant difference in the pre-test and post-test knowledge score in the experimental group

Table 1
Comparison of pretest and posttest knowledge score regarding newborn care among staff nurses in experimental group

N=120

Observation	Mean \pm SD	SE	Paired t value	df	(p value) Significance
Pre test	20.68 \pm 4.68	0.42	1.89	59	.002*
Post test	31.68 \pm 1.71+	0.15			

Table 1 revealed that the mean post-test knowledge score was higher i.e. (31.66 \pm 1.71) than the mean pretest knowledge score i.e. (20.68 \pm 4.68) in the experimental group. The difference was found to be statistically significant at p=0.05 level of significance. The calculated t value was (t=1.89) less than the table value. Hence there was no significant difference in the mean pretest and post-test knowledge scores in experimental group. Hence the research hypothesis (H1) was rejected at 0<0.05.

Table 2
Comparison of pretest and posttest practice score regarding newborn care among staff nurses in experimental group

Observation	Mean ± SD	SE	Paired t value	df	(p value) Significance
Pre test	21.03±1.30	0.11	2.33	59	.002*
Post test	24.71 ±0.45	.03			

Table 2 revealed that the mean post-test practice score was higher i.e. (24.71±0.45) than the mean pretest practice score i.e. (21.03 ±1.30) in the experimental group. The difference was found to be statistically significant at p=0.05 level of significance. The calculated t value was (t= 2.33) more than the table value. Hence there was significant difference in the mean pretest and post-test practice scores in experimental group. Hence the research hypothesis (H1) was accepted at $0 < 0.05$.

Objective 4: To compare the pretest and the posttest knowledge and practice regarding newborn care among staff nurses in control group

Hypothesis (H2): There is a significant difference in the pretest and posttest knowledge and practice score in the control group
Table 3

Table 3
Comparison of pretest and the posttest knowledge regarding newborn care among staff nurses in control group

Observation	Mean ± SD	SE	Paired t value	df	Significance
Pre test	16.05 ±6.65	0.60	8.50	59	.000*
Post test	26.03 ±3.66	0.33			

Table 3 revealed that the mean post-test knowledge score was higher i.e. (26.03 ±6.65) than the mean pretest knowledge score i.e. (16.05 ±3.66) in the experimental group. The difference was found to be statistically significant at p=0.05 level of significance. The calculated t value was (t=8.50) more than the table value (2.00). Hence there was significance difference in the mean pretest and post-test knowledge scores in control group. Hence the research hypothesis (H2) was accepted at $0 < 0.05$.

Table 4
Comparison of pretest and the posttest practice regarding newborn care among staff nurses in control group

Observation	Mean ± SD	SE	Paired t value	df	Significance
Pre test	14.23 ±4.56	0.41	6.348	59	.001*
Post test	24.71 ±0.45	0.04			

Table 4 revealed that the mean post-test practice score was higher (24.71 ±0.45) than the mean pretest practice score (14.23 ±4.56) in the control group. The difference was found to be statistically significant at p=0.05 level of

significance. The calculated t value was ($t = 6.348$) less than the table value (2.00). Hence there is significant difference in the mean pretest and post-test practice scores. Hence the research hypothesis (H2) was accepted at $0 < 0.05$.

Hypothesis (H3): There is a significant difference between the posttest knowledge score of experimental and control group

Table 5
Comparison of posttest knowledge regarding newborn care among staff nurses in experimental and control group

Observation	Mean \pm SD	SE	Unpaired t value	df	(p value) Significance
Experimental group	31.66 \pm 1.17	0.15	2.04	59	.000*
Control group	26.03 \pm 3.66	0.33			

Table 5 revealed that the mean experimental group knowledge score was higher (31.66 \pm 1.17) than the mean control group knowledge score (26.03 \pm 3.66). The difference was found to be statistically significant at $p = 0.05$ level of significance. The calculated t value was ($t = 2.04$) more than the table value (2.00). Hence there was significant difference in the mean experimental group knowledge score and mean control group knowledge score. Hence the research hypothesis (H3) was accepted at $0 < 0.05$.

Discussion

The findings of the study have been discussed in terms of the objectives, theoretical base and hypothesis formulated. The findings of the study revealed that the staff nurses had a low level of knowledge and practice about new born care before the administration of the simulation training. The simplest method of testing the effectiveness of the simulation training program is to administer the same set of objectively structured questions, and checklist before and after the session and to analyze the difference.

In the present study post-test knowledge, and practice scores of staff nurses were significantly higher than pre-test knowledge, and practice scores after the simulation training program. The simulation training was found to be an effective strategy in increasing the knowledge, and practice of staff nurses. Thus it was suggested that the simulation training was beneficial to the staff nurses in enhancing their knowledge, and practice regarding new born care. Similar findings were reported by Berhe AK. et.al published in 2017, Entitled as newborn care among staff nurses in Ethiopia. The study concluded that there was knowledge and practice gap regarding newborn care. There was immense need of refreshment training on immediate newborn care regularly (5).

A similar study conducted by Kwai meng, Fook choe et al Simulation-based education (SBE) is increasingly used as an education tool to improve learning for healthcare providers. In newborn care practice, SBE is used in the Neonatal Resuscitation Program (NRP) and training in procedural skills. The NRP is a mandatory course in Malaysia for all house officers (interns) and medical officers

(residents) during their pediatric rotation. Almost 30,000 of NRP providers have been trained over the last 5 years. The recent establishment of the Allied Healthcare Center of Excellence (AHCoE), an organization dedicated to promoting SBE, and Malaysian Society for Simulation in Healthcare (MaSSH) aims to enhance the integration of SBE into the healthcare training curriculum and set up a local healthcare simulation educator training program. Our experience in implementing SBE necessitated that we made several important choices. As there was no strong evidence to favor high-fidelity over low-fidelity simulation, and because simulation centers can be very costly to set up with limited resources, we chose SBE mainly in the form of low-fidelity and in situ simulation (6).

Conclusion

As per the findings, the staff nurses has less knowledge and practice regarding newborn care. But the study revealed that simulation training has improved the knowledge and practice regarding immediate and routine newborn care among staff nurses. A further research study can be conducted to discover more effective strategies in order to promote the knowledge and practice of staff nurses. A similar study can be conducted by using various instructional media that is SIM (Self Instruction Module), VATM (Video Assisted Teaching Module) etc.

Conflict of interest

There is no conflict of interest such as financial or personal during the time of validating the tool, data collection and disseminating the research finding.

Source of funding

The source of funding for the current research study is by the researcher.

Ethical clearance

Ethical clearance was obtained from the authorities of Rohilkhand Medical college hospital and Varunarjun Hospital . All study participants were informed about the purpose of the study, their right to refuse participation and written and signed voluntary consent was obtained from all study participants prior to the data collection. The respondents were also informed that the information obtained from them was treated with utmost confidentiality.

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