

Effectiveness of Self - Instructional Module (SIM) Cum Demonstration on Knowledge and Practice regarding Neonatal Resuscitation Protocol (NRP) among Staff Nurses

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Abstract: *Background:* More than 100 million babies are born annually worldwide.90% of neonates successfully make this transition without the need for help. The remaining 10% of newborns require some assistance to begin breathing at birth; among them, 1% or more may require intensive resuscitative efforts.1 Newborn care and resuscitation is an important starting point for any neonatal programme that is required to ensure the best possible start in life.2 *Methodology:* The research design for the study was a pre - experimental one - group pre - test post - test design. The study sample comprised 60 staff nurses recruited from a selected hospital using purposive sampling. Data was collected using tools consisting of three sections (sample characteristics, structured knowledge questionnaire, and practice checklist). The data gathered was analysed and interpreted using descriptive and inferential statistics. *Results:* The findings of the study concluded that the Self - Instructional Module (SIM) cum demonstration on knowledge and practice regarding Neonatal Resuscitation Protocol (NRP) among staff nurses was effective. The study recommends that a similar study be conducted in nursing colleges to assess the knowledge and practice of student nurses.

Keywords: Self - Instructional Module (SIM), Demonstration, Neonatal Resuscitation Protocol (NRP), knowledge, practice, Staff nurses

1. Introduction

A newborn is precious to his parents, family, community, nation and the world. The newborn baby is considered tiny and powerless, utterly dependent on others for life within one minute of birth.³ The promotion of essential newborn care practice is the most. Important approach to improving the health outcomes of newborn babies health.⁴ Newborn deaths are caused by asphyxia at birth, which can be prevented by effective and rapid resuscitation.⁵ Neonatal Resuscitation is an essential component of maternal and child health services and is an inexpensive intervention by which many newborn lives can be saved.⁶

Most newborn deaths are associated with birth asphyxia (40%), low birth weight and prematurity (25%), and infections (20%). In developed countries, the Neonatal Resuscitation Program (NRP) is the primary educational mechanism to teach healthcare providers (HCPs) to perform neonatal resuscitation.⁷

2. Materials and Methods

2.1 Objectives

- To evaluate the effectiveness of the Self - Instructional Module (SIM) cum demonstration on knowledge and practice regarding Neonatal Resuscitation Protocol (NRP) among staff nurses

- To find the correlation between knowledge and practice regarding Neonatal Resuscitation Protocol (NRP) among staff nurses.
- To determine the association between knowledge and practice scores regarding Neonatal Resuscitation Protocol (NRP) among staff nurses with selected sample characteristics.

2.2 Operational Definitions

- Self - Instructional Module (SIM) cum demonstration on Neonatal Resuscitation Protocol (NRP):** Intervention guidelines prepared, validated and administered by the researcher to the staff nurses regarding Neonatal Resuscitation Protocol (NRP) which includes meaning of resuscitation, initial steps in resuscitation (temperature, positioning and clearing secretions), bag and mask ventilation, judicious use of oxygen, chest compression, medications and algorithm in the form of double - sided two folded pamphlet. In addition, the researcher demonstrates the same using a dummy for a small group of staff nurses at a time through interactive teaching focusing on hands - on skills performance.
- Knowledge:** Level of awareness of the staff nurses regarding Neonatal Resuscitation protocol (NRP) as measured through a structured questionnaire.
- Practice:** Performance of the staff nurses regarding Neonatal Resuscitation protocol (NRP) as demonstrated on the dummy as measured using checklist.

- **Staff Nurses:** Registered nurses and midwives working in selected hospitals.

2.3 Methodology

The study was conducted in 2023 at a selected hospital in Bengaluru, a 400 - bed multispeciality hospital accredited by the National Accreditation Board for Hospitals (NABH). The duration of data collection, including pre - test and post - test, was two weeks.

The research design was a pre - experimental one - group pre - test post - test design with a quantitative evaluative approach. The instrument used in the study consisted of three sections. Section one was sample characteristics, section two was a knowledge questionnaire, and section three was a practice checklist—tool validation done by nineteen experts. The reliability of the tools was established. The pilot study was conducted to assess the feasibility of the main study. For the main study, 60 staff nurses from a selected hospital were selected using a purposive sampling technique. The pre - test was conducted using the tool mentioned above, followed by intervention regarding Neonatal Resuscitation Protocol (NRP), administered using a double - sided two - fold pamphlet and a demonstration on a dummy, respectively. The post - test was conducted after seven days. Data were analysed by using descriptive and inferential statistics.

3. Results and Interpretation

Section – I: Description of Sample Characteristics

Among the staff nurses, most (63%) were in the age group of 21 - 25 years, 25% were in the age group of 25 - 30 years, and 12% were in the age group of 30 - 35 years. Regarding gender, the majority (87%) were females, and 13% were males. Regarding education, little more than half (55%) of them completed their GNM Nursing, and little less than half (45%) completed their BSc Nursing. With regards to years of experience, three - quarters (75%) had less than two years of experience, less than a quarter (17%) had two to five years of experience, and very few (8%) had more than five years of experience. Regarding the current area of work, a little more than a quarter (33%) of staff nurses were working in the emergency room, 13% in the maternity wards, and 10% in the pediatric ward. Less than a quarter (22%) worked in the operation theatre and medical - surgical ward. None of the staff nurses had attended any programs regarding neonatal resuscitation apart from primary education during the course, and none of them had resuscitated newborns previously.

Section – II: Description of pre - test and post - test knowledge and practice scores regarding Neonatal Resuscitation Protocol (NRP) following Self - Instructional Module (SIM) cum demonstration among staff nurses.

- In the pre - test, a majority (82%) of staff nurses had moderate knowledge, 18% of them had inadequate knowledge, and none of them had adequate knowledge, whereas in the post - test majority (92%) of the staff nurses had adequate knowledge, few (8%) of them had

moderately adequate knowledge and none of them had inadequate knowledge.

- All the aspect - wise knowledge scores following Self - Instructional Module (SIM) cum demonstration showed good enhancement. The highest enhancement (46%) was found in the “Post Resuscitation care” aspect.
- In the pre - test, none of the staff nurses had adequate practice, 63% of them had moderately adequate practice, and much more than a quarter (37%) of them had inadequate practice, whereas in the post - test, the majority (92%) of staff nurses had adequate practice, few (8%) of them had moderately adequate practice and none of them had inadequate practice

Section – III: Comparison between pre - test and post - test knowledge and practice scores regarding Neonatal Resuscitation Protocol (NRP) following Self - Instructional Module (SIM) cum demonstration among staff nurse

Table 1: Overall Mean, SD and paired t value of pre and post - test knowledge scores regarding Neonatal Resuscitation Protocol (NRP) among staff nurses.

| Knowledge scores | Mean | Mean Difference | SD | Paired t - Value | df | Sig. (p - value) |
|------------------|------|-----------------|-----|------------------|----|------------------|
| Pre - test | 20.6 | 12.8 | 3.1 | 24.91 | 59 | 0.0001* |
| Post - test | 33.4 | | 2.7 | | | |

Note: * refers to Significant difference at 95% CI, ($t_{59}=1.671$)

The data presented in the table1 depicts that the mean pre - test knowledge score is 20.6 ± 3.1 , and the mean post - test knowledge score is 33.4 ± 2.7 . The mean difference is 12.8. The computed paired ‘t’ value is 24.91, more significant than the table value ($t_{59}=1.671$) at a 0.05 significance level. Hence, the research hypothesis (H1) is accepted, stating a statistically significant difference in staff nurses' pre - and post - test knowledge regarding the Neonatal Resuscitation Protocol (NRP).

Table 2: Overall Mean SD and paired ‘t’ value of pre and post - test practice scores regarding Neonatal Resuscitation Protocol (NRP) among staff nurses, n=60

| Practice scores | Mean | Mean Difference | SD | Paired t - Value | df | Sig. (p - value) |
|-----------------|------|-----------------|-----|------------------|----|------------------|
| Pre - test | 15.9 | 8.7 | 2.2 | 21.01 | 59 | 0.0001* |
| Post - test | 24.6 | | 2.7 | | | |

Note: * refers to Significant difference at 95% CI, ($t_{59}=1.671$)

The data in Table 2 depicts the mean pre - test practice score as 15.9 ± 2.2 and the mean post - practice score as 24.6 ± 2.7 . The mean difference is 8.7. The computed paired ‘t’ value is 21.01, more significant than the table value ($t_{59}=1.671$) at a 0.05 significance level. Hence, the research hypothesis (H₂) is accepted, stating a statistically significant difference in the pre and post - test practice scores regarding Neonatal Resuscitation Protocol (NRP) among staff nurses.

Section – IV: Correlation between knowledge and practice scores regarding Neonatal Resuscitation Protocol (NRP) among Staff nurses

Table 3: Correlation between pre and post - test Knowledge and Practice scores regarding Neonatal Resuscitation Protocol (NRP) among staff nurses, n=60

| Variables | r value | Inference |
|---|---------|---------------------------|
| Pre - knowledge and Pre - practice scores | 0.38 | Low positive correlation |
| Post - knowledge and Post - Practice scores | 0.97 | High positive correlation |

The data presented in Table 3 depicts that a low positive correlation exists between pre - test knowledge and practice scores ($r=0.38$), and a high positive correlation exists between post - test knowledge and practice scores ($r=0.97$). Hence (H_3) is accepted, stating that a statistically significant correlation exists between the pre - test and post - test knowledge and practice regarding Neonatal Resuscitation Protocol (NRP) among staff nurses.

Section – V: Association between knowledge and practice scores regarding Neonatal Resuscitation protocol (NRP) among staff nurses with selected sample characteristics

The computed Chi - square values for the pre - test knowledge scores and sample characteristics such as age in years ($\chi^2=0.751$), gender ($\chi^2=0.1154$), education ($\chi^2=0.1212$), years of experience ($\chi^2=5.1069$) and current area of working ($\chi^2=3.172$) and similarly practice scores and sample characteristics such as age in years ($\chi^2=1.252$), gender ($\chi^2=2.65$), education ($\chi^2=0.104$), years of experience ($\chi^2=0.669$) and current area of working ($\chi^2=1.6569$) were found to be less than the corresponding table values. Hence, H_4 is rejected, stating that there is no statistically significant association between the pre - test knowledge scores regarding Neonatal Resuscitation Protocol (NRP) among staff nurses with selected sample characteristics, and H_5 is rejected, stating that there is no statistically significant association between the pre - test practice scores regarding Neonatal Resuscitation Protocol (NRP) among staff nurses with selected sample characteristics.

4. Discussion

The present study's findings are compared and contrasted in the following section. A study from Rwanda revealed that neonatal resuscitation competency dropped to an unsatisfactory level three months after the training, indicating that training alone was inadequate to retain the health worker's neonatal resuscitation knowledge and skills.⁸

The present study results reveal that the knowledge and practice regarding Neonatal Resuscitation Protocol (NRP) among staff nurses was better following seven days of Self - Instructional Module (SIM) cum demonstration. A pre - experimental designed study supported the above findings. With regards to the pre - test knowledge, the majority, 47 (78.3%) of GNM Interns had good knowledge, followed by 12 (20%) had average knowledge and only one (1.7%) had poor knowledge. In the post - test, the majority of 54 (90%) GNM interns had good knowledge, followed by 6 (1.0%), who had average knowledge, and none of the GNM interns 0 (0.0%) had poor knowledge regarding neonatal resuscitation.⁹

In the present study, the mean difference is 12.8 and computed paired 't' value is 24.91, greater than the table value ($t_{59}=1.671$) at 0.05 significance level. Similarly, a pre

- experimental one - group pre - test post - test designed study supported the present study findings. The overall average score was 10.58 (± 2.73) and 14.02 (± 2.19) for the pre - test and post - test, respectively, and the observed difference was significant ($p < .001$).¹⁰

With regard to practice scores in the present study, the mean difference is 8.7. The computed paired 't' value is 21.01, more significant than the table value ($t_{59}=1.671$) at a 0.05 significance level. A quasi - experimental non - randomized pre - test post - test control group design study supported the above findings. There was a highly significant difference in the practices of nurses regarding neonatal resuscitation between the experimental and control groups at a 0.01 level of significance.¹¹

The present study result exhibits A low positive correlation between pre - test knowledge and practice scores ($r=0.38$) and a high positive correlation between post - test knowledge and practice scores ($r=0.97$).

The study findings are supported by a descriptive, correlational, and comparative study. The correlation between frequency of skill performance and comfort was higher for nurses than physicians ($r=.50$ vs. $.34$). Nurses who were current Neonatal Resuscitation Program providers had significantly higher average levels of comfort (3.67 vs 3.11; $p < .01$), knowledge (72.18 vs 60.71; $p < .01$), and recent experience (0.94 vs 0.51; $p < .01$) with resuscitation skills than nurses who were not current Neonatal Resuscitation Program providers.¹²

The computed Chi - square values for the present study pre - test knowledge and practice scores and sample characteristics were found to be less than the corresponding table values.

The present study findings were supported by a descriptive research design. Sample characteristics like age and experience in NICU were statistically significant.¹³

5. Nursing Implications

Nursing Implications

The study's findings have revealed specific facts that can be practicable in following eminent implications related to nursing practice, nursing education, nursing administration, and nursing research.

Nursing Practice

- Neonatal Intensive Care Unit (NICU) and Paediatric Intensive Care Unit (PICU) nurses should be motivated to participate voluntarily in any education programme regarding Neonatal Resuscitation Protocol (NRP) to provide quality nursing care.
- There is an enormous need to be involved in continuing nursing education programmes, seminars, workshops, symposiums and in - service education to improve their knowledge and practice.

Nursing Education

- The nurse educator can use Self - Instructional Module (SIM) cum demonstration regarding Neonatal

Resuscitation Protocol (NRP) to teach the students effectively by encouraging students' participation to improve their practical skills.

- An awareness to be created regarding the significance of resuscitation techniques to make staff nurses involved and to avoid complications during birth.

Nursing Administration

- Nursing administrators are central in planning and organising seminars, workshops, educational programs, in-service education, and continuing nursing education programs based on current guidelines for staff nurses.
- The nurse administrator can arrange to exhibit posters, printed materials, pamphlets, and campaigns regarding the Neonatal Resuscitation Protocol (NRP) – algorithm in nurses' stations.

Nursing Research

- The present study's findings serve as a base for conducting further studies. In this expensive world, nurses should be attributing themselves and play a vital role in cost-effectively promoting the Neonatal Resuscitation Protocol (NRP).
- The study stimulates the budding researchers to do much more research among staff nurses with regard to health as a matter of concern, and this study can be a reference tool for further research studies.

6. Recommendations

Considering the findings of the present study, the following recommendations were made.

- The study can be replicated on large samples in different settings for a generalised finding.
- A similar study can be conducted in nursing colleges to assess the knowledge and practice of student nurses.
- A study can be conducted using other interventions such as information booklets, guidelines, planned teaching programmes, and video-assisted programmes.

7. Limitations

- The study was conducted in a small group of staff nurses (60), limiting the generalisation of the findings.
- The study was conducted in specific wards, which imposes limits to any more significant generalisation.
- The study was limited to only staff nurses working in selected hospitals in Bengaluru.

8. Conclusion

Conducting the study helped the researcher gain more knowledge and skills related to the Neonatal Resuscitation Protocol (NRP). The researcher underwent training in the IAP - NNF Neonatal Resuscitation Programme First Golden Minute Project, which the Indian Academy of Pediatrics organised in Bengaluru, and the BLS/ ACLS/ PLS/ PALS/ AED workshop which was organised by MOHFW - Government of India in Tamilnadu, which helped to acquire knowledge and practice on Neonatal Resuscitation Protocol (NRP). Completing the present study satisfied the researcher

with sensitising the staff nurses regarding NRP, especially during golden hour.

Ethical clearance - Taken.

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