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Original Research Paper

Nursing

EFFECTIVENESS OF SIMULATION BASED TEACHING PROGRAM ON KNOWLEDGE AND SKILL REGARDING BASIC NEONATAL RESUSCITATION PROCEDURES AMONG FEMALE HEALTH WORKERS OF SELECTED AREAS: A STUDY PROTOCOL

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ABSTRACT

Background Of The Study: Worldwide, 136 million babies are born annually. 10 million require some stimulation at birth to breathe, while 6 million require basic resuscitation with a bag and mask. Evidence shows that 1 million neonatal deaths occur yearly on the day of birth. Near about 2 million babies die in the first week of life and 4 million die in the neonatal period, which accounts for 46% of under-five mortality. This mortality is estimated to increase to 52% in 2030 unless strategic interventions are implemented. **Objective:** To assess the effect of a simulation-based teaching program on knowledge and skill regarding basic neonatal resuscitation procedures among female health workers of selected areas. **Methodology:** Pre-experimental one group pre-test post-test research design will be used. The duration of the study will be one month. 60 female health workers from selected primary health centres and sub-health centres of Nagpur district will be selected as a sample through the simple random sampling technique. The structured questionnaire and standardized observational checklist will be used to assess the knowledge and skill respectively. Validity and reliability of the tool will be determined with appropriate standardized methods. **Expected Result:** Enhance knowledge and skill after simulation-based teaching program. **Limitation:** Female health workers working in primary health centres and sub-health centres of Nagpur district will be included in this study. **Conclusion:** The study findings will reflect the need for simulation based education to enhance the knowledge and skill of female health workers to identify birth asphyxia and its potential complications leading to neonatal mortality during the first few hours after birth.

KEYWORDS : Simulation, Neonate, Resuscitation, Knowledge, Skill, Female health worker

INTRODUCTION:

New-borns are considered to be tiny and powerless beings, completely dependent on others for their adaptation to the external environment. Every new-born presents uniquely and has certain individual needs. Approximately 85% to 90% of infants make the transition from intrauterine to extra-uterine life with no assistance necessary. However, some assistance may be required for the remaining few new-borns, ranging from simple stimulation to complete resuscitation. Birth asphyxia is an important cause of preventable neonatal morbidity and mortality. The most physiological change that takes place in the neonate is the transition from foetal circulation to independent survival.[1] Worldwide, 136 million babies are born annually. 10 million require some stimulation at birth to breathe, while 6 million require basic resuscitation with a bag and mask. Evidence shows that 1 million neonatal deaths occur yearly on the day of birth. Near about 2 million babies die in the first week of life and 4 million die in the neonatal period, which accounts for 46% of under-five mortality. This mortality is estimated to increase to 52% in 2030 unless strategic interventions are implemented.[2] With the birth of 25 million children each year India accounts for nearly one-fifth of the world's annual child births. Every minute one of those babies dies.

The majority of all neonatal deaths (75%) occur during the first week of life. Of those deaths, between 25% to 45% occur within the first 24 hours. Further, the neonatal period which comprises the first 28 days of life accounts for 37% of all deaths among children under five. Pre-maturity (35 percent), neonatal infections (33 percent), birth asphyxia (20 percent), and congenital malformations (9 percent) are among the major causes of new-born deaths.[3,4] A single intervention is 'Resuscitation' deals with the problem of birth asphyxia as it occurs. Neonatal resuscitation refers to the actions taken to revive or restore life to a baby who is experiencing asphyxia or is not breathing effectively after birth. It is a critical intervention aimed at establishing breathing and ensuring the survival of the new-born. The need for resuscitation should always be anticipated. Thus, every birth attendant should be skilled in new-born resuscitation including anticipation, preparation, timely recognition, and quick and correct action to be able to respond quickly and correctly when needed. Failure to recognize the problem accurately, delayed response, and ineffective ventilation are among the common causes of failed resuscitation in new-borns.[1] New-born resuscitation is a critical aspect of healthcare, and the first few minutes of a new-born's life, often referred to as the "golden minute," are crucial for their well-being. During this time, healthcare providers must be prepared to assess and intervene promptly if necessary.[5]

The pre-experimental study was conducted by Nanthini Subbiah, Jyoti Sarin et.al at the Trained Nurses Association of India in 2011 among 71 nurses working at nursery and allied units of District and Sub-district hospitals across the country. It assessed the effectiveness of teaching intervention in terms of the knowledge and skill of nurses on Neonatal Resuscitation. A purposive sampling technique was adopted to select the samples. Tools used for data collection were a Structured Knowledge questionnaire and simulated situations with an observational checklist. The study findings reflect the need for teaching to enhance the knowledge and skill of nurses to identify birth asphyxia and its potential complications leading to neonatal mortality during the first few hours after birth. As Practical skills appear to decline faster than theoretical knowledge regular in-service instruction is required every year.[7]

OBJECTIVES:

1) To assess knowledge and skills regarding basic neonatal resuscitation procedure among female health workers of selected areas.

2) To assess the effect of simulation-based teaching

programme on knowledge and skill regarding basic neonatal resuscitation procedure among female health workers of selected areas.
3) To associate study findings with selected demographic variables.

Hypothesis:

H_0: There is no significant difference between the pre-test and post-test knowledge and skill score of simulation-based teaching programme regarding basic neonatal resuscitation procedure among female health workers.

H_1: There is significant difference between the pre-test and post-test knowledge & skill score of simulation-based teaching programme regarding basic neonatal resuscitation procedure among female health workers.

MATERIAL AND METHODS:

Study Design:

Pre-experimental one-group pre-test post-test research design will be used for the study.

Study Setting:

The Study will be conducted in selected primary health centres and sub- health centres of Nagpur district Maharashtra, India.

Participants:

The participants will be female health workers working in primary health centres and sub-health centres.

Sample Size Calculation:

Formula Used:

$n = (Z_{\alpha/2} + Z_{\beta})^2 * 2 * \sigma^2 / d^2$,

Where:

$Z_{\alpha/2}$ is the critical value of the Normal distribution at $\alpha/2$ (for 95%, the critical value is 1.96),

Z_{β} is the critical value of the Normal distribution at β (e.g. for 90% power, the critical value is 1.282),

σ^2 is the population variance = 350

d is the difference you would like to detect = 11.6 ***(taken from reference article)***[8]

Putting these values in the formula, the required sample size = 55

Adding a 10% non-response rate, the required **sample size = 60**

Sampling Technique:

Simple Random sampling without replacement.

Inclusion Criteria:

1. Female health workers who are willing to participate in the study.
2. Can read, write and speak Hindi and Marathi languages.

Exclusion Criteria:

Female health workers who have undergone any previous training in basic neonatal resuscitation.

Variables:

Independent variable: Simulation-Based Teaching Programme.

Dependent variable: Knowledge and Skill.

Data collection tools:

1. Demographic sheet
2. Structured Questionnaire for assessment of knowledge
3. Standardized observational checklist for assessment of skill

Knowledge Assessment:

Female Health Workers' knowledge will be assessed by pre and post-test using self structured multiple-choice questions (MCQs). Validity and reliability of tool will be assessed by appropriate statistical measures. Validity over the questionnaire will be established for build up through both the construct & content manner to seek for the results what has intended purposely for the inferences & conclusion to measure. Knowledge assessment will consider poor if the score is < 33 %, Average if it is 33.01 to 66 %, and Good if it is > 66.01%.

Skill Assessment:

The Female Health Workers' skills will be assessed by using the standardized observational checklist with 12 tasks. Score one will be awarded for every correctly performed task. FHWs will be considered competent with >75% score in the hands-on tasks and < 75% score considered need of improvement.[9]

Description of Intervention:

Simulation-based teaching programme on basic neonatal resuscitation procedure is an interactive learning experience designed to enhance the knowledge and skills of female health care workers in the management of newborns who require resuscitation at birth. The programme makes use of realistic scenarios and mannequins to provide a safe and controlled environment for female health care workers to practice and master the essential steps of neonatal resuscitation. The simulation-based teaching programme involves interactive lectures, and hands-on practice sessions. The lectures cover the fundamental concepts of neonatal resuscitation, and hands-on practice sessions utilize mannequins that simulate newborns requiring resuscitation, and participants are guided through the steps of the resuscitation procedure by instructors who provide feedback and suggestions for improvement.

Study Procedure And Data Collection:

The study shall be conducted only after the approval of the IEC. Permission to conduct the study shall be taken from relevant stakeholders. Female health workers who fulfil inclusion criteria shall be assigned to the study. Written informed consent shall be taken from the participants. Each participant will receive a code number and self-administered questionnaires. A self-administered questionnaire will be used to obtain information on the socio-demographics of participants. Thereafter, baseline knowledge and skills will be assessed. Ensuring proper spacing of participants in research studies is a common practice to minimize the potential for copying or sharing information during data collection. This approach helps maintain the integrity and validity of the study results. Thereafter, a Simulation-based teaching program on basic neonatal resuscitation will be conducted for the participants on the same day. After seven days post-test for knowledge assessment and skills evaluation will be conducted.

Statistical Analysis:

All the results will be calculated using SPSS version 26. Overall results for the outcome variables will be listed in tables for both descriptive (Mean, mean percentage, Standard deviation), & inferential statistics (Paired t - test will be used to find the significance difference between two groups (before & after), Association results will be analyzed using chi square analysis).

RESULTS:

Simulation-based teaching programs will be effective in increasing knowledge and skill regarding basic neonatal resuscitation procedures among female health workers.

There will be positive or negative correlation between knowledge, skill regarding basic neonatal resuscitation

procedure and demographic variables.

DISCUSSION:

The present study findings will be supported by the study conducted by Santosh et al. (2021) aimed to evaluate the effect of a simulation-based neonatal resuscitation training program on the knowledge, skill, and attitude of female health workers in India, found that the simulation-based training program led to a significant improvement in the knowledge, skill, and attitude of female health workers regarding neonatal resuscitation procedures. The mean knowledge score increased from 5.2 to 9.2 out of 10, the mean skill score increased from 3.3 to 6.8 out of 10, and the mean attitude score increased from 24.8 to 31.5 out of 35.[10]

CONCLUSION:

The present study will aims to assess the effectiveness of simulation-based teaching programs on knowledge and skill regarding basic neonatal resuscitation procedures among female health workers. From the data analysis findings, it will be clear that the simulation-based teaching program will enhance the knowledge and skill of female health workers. Hence, a simulation-based teaching program will improve knowledge and skills of female health workers regarding neonatal resuscitation procedures and prevention of early neonatal complications and mortality.

Consent and ethical approval:

The present study was approved by the Institutional Ethics Committee of Government Medical College, Nagpur. (GMC/IEC/2022-23/1667 dated 06.08.22). Permission will be obtained from relevant stakeholders to conduct the study. All participants of this study will be asked to read and sign the written informed consent form. Confidentiality will be maintained throughout the study. The results of the study will be disseminated to the participants after completion of study and will publish in peer-reviewed journal.

Conflict Of Interest: Authors declare no conflicts of interest.

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