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A STUDY TO ASSESS THE EFFECTIVENESS OF PLANNED TEACHING PROGRAMME ON KNOWLEDGE AND PRACTICE REGARDING INFECTION CONTROL MEASURES IN NEONATAL INTENSIVE CARE UNIT AMONG NURSING STAFFS WORKING IN SELECTED HOSPITALS AT BANGALORE

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INTRODUCTION:

Health can neither be demanded nor given, it can neither be brought, nor sold but the circumstances and services that are pre - requisite to health can certainly be demanded and received as a right. A productive environment in the hospital unit is very essential as a pre-requisite particularly, when considering the services provided in the Neonatal Intensive Care Unit provision for a safe and protective environment is a prior need[1].

Neonatal nosocomial infections are an important cause of neonatal morbidity. However, its reporting in our country is non uniform. According to recent report in India the neonatal infection rate is 44/1000 live birth. The reported incidence of nosocomial sepsis in neonates from India ranges from 1.5% to 37%. In contrast, surveillance reports from the USA have reported a rate of 0.9% to 7%. Neonatal infection in the neonatal intensive care Unit is a problem of developing and developed countries. Approximately 70% of infant discharged from community teaching hospital reported neonatal nosocomial infection rate of 0.9% to 1.1% in United Kingdom[2].

Nursing standards are developed and enforced by various health agencies such as the American Academy of Pediatrics, Hospital Accreditation Boards and Local Health Agencies. Provisions governing space, control of temperature and humidity, lighting and safety from fire and other hazards are considered. Each newborn infant has her or his own crib, bath equipment and linen supply. Any common equipment is sterilized after each use[4]. Measures for reducing neonatal infection deserve high priority in every neonatal unit. Most neonatal infections are preventable if asepsis is maintained in the nursery. Prevention consists of two components, prevention of the disease and control of its spread to others. Implementation of the standard precaution is the primary strategy for successful nosocomial infection control. So, all the nursing personnel working in the neonatal unit should make a conscious and determined effort to enforce aseptic techniques at all time[5]. There is a need for multicentric neonatal infection surveillance system, using uniform definition and reporting formats to generate information on neonatal nosocomial infection rates and risk factors in our setting, so that approximate preventive strategies can be adopted[6].

In order to reduce the infant mortality rate and to contribute to the health for all by 2025 AD goal, it is the responsibility of each health care providers, to control and prevent neonatal infection especially in neonatal intensive care unit, where care specialized is rendered to the citizens of tomorrow[2.].

Antibiotics can be effective for neonatal infections, especially when the pathogen is quickly identified. Instead of relying solely on culturing techniques, pathogen identification has improved substantially with advancing technology; however, neonate mortality reduction has not kept pace and remains 20% to 50%.While preterm neonates are at a particularly high risk, all neonates can develop infection. [7]

NEED FOR THE STUDY:

Infections are significant causes of morbidity and mortality in neonatal unit. A survey of fifteen major neonatal centers indicates indicated that infants who developed late onset sepsis had a significantly longer hospital stay and higher mortality than babies who were not infected. Neonates, especially those of low and very low birth weight, are at particularly high risk for infection due to their immune status. Hospital acquired infection result in an enormous burden of increased morbidity and mortality[1].

Neonates represent a unique and highly vulnerable patient population. Immunologic immaturity and altered cutaneous barriers play same role in the vulnerability on neonates to nosocomial infection rates of infections in neonate intensive care units have varied from 6% to 40% of neonatal patients with the highest sates in those facilities having larger proportions of very low birth weight infants[8].

Neonatal infection rates in developing countries are 3-20 times higher than in industrialized countries. Among hospital-born babies these infections are responsible for 4% to 56% of all causes of death in the neonatal period, in which 3/4 of the infections occurs in South East Asia and sub-Saharan Africa[9].

Neonatal intensive care units are vulnerable to outbreaks and sporadic incidents of health care associated infections are determined by the degree of immaturity of the neonatal immune system. Invasive procedures involved, the etiological agent and its antimicrobial susceptibility pattern and above all, infection control policies practiced by the unit it is important to raise awareness of infection control practices in resource-limited settings, since over dependence upon antimicrobial agent and co-existing lack of awareness of infection control is encouraging the emergency of multi-drug-resistant nosocomial pathogens[10].

India's recent surveys have indicated that the incidence of fungal infections has increased over the past few years, fungal infection is the most commonly recognized infection in a study conducted by Abida Malick et al, septicemia was found the commonest (90 percent) infection, which is in concordance with the result of other workers. A recent survey of fifteen major neonatal centers indicated that infants who developed late onset sepsis had a significantly longer hospital stay and higher mortality than patients who were not infected[11].

Nursing personnel working in the neonatal unit should be knowledgeable and skillful in prevention of neonatal infections. Nursing personnel are by group and constantly working with the newborns in neonatal units. If nursing personnel fails to adopt the infection control techniques, it will lead to septicemia and neonatal death. In order to reduce infant mortality rate, the nursing personnel should be knowledgeable and skillful in providing infection free nursing care[13].

Newborn care is one of the vital sectors to be looked into in order to reduce neonatal mortality and morbidity. Infection is a great area of concern, especially for preterm babies. There are some steps for infection control steps such as Clean immediate environment, Standardize the NICU design, Hand hygiene, use of alcohol—base hand rubs, Visitors' policy / Mobile restriction, gowning to reduce nosocomial infection, Jewelry and fingernails Policy, Prevent proliferation of microbes in the NICU[14].

The researcher during her clinical experience found many practices in the neonatal unit which may lead to neonatal infection. E –coli, Klebsiella, methicillin-resistant staphylococcus aureus is the organism commonly seen. The infection control nurse in the hospital planned to conduct a training programme regarding infection control measures. After the training programme, there was tremendous reduction in the infection rates in the neonatal unit.

Therefore, the investigator thought by giving a Planned teaching programme to the nursing personnel regarding the infection control measures in the neonatal intensive care unit will improve the knowledge and practice of nursing personnel, which will in turn reduce the infection rates in the NICU and promote the health of the baby as well as maintain the hospital protocol for infection control measures.

HYPOTHESIS

H_1 : There is a significant relationship between the knowledge and practice of nursing staffs regarding infection control measures in neonatal intensive care unit.

H_2 : The mean post-test knowledge score of nursing staffs after the administration of planned teaching programme will be higher than the mean pre-test knowledge score.

H_3 : There will be significant association between the knowledge and practice scores with selected demographic variables

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CONCEPTUAL FRAMEWORK BASED ON HEALTH PROMOTION MODEL:

Theories are linked to the real world through definition that specifies how concepts will be known, experienced, observed and measured. Theories guide decision-making by providing the supporting conceptualization for the study such as significance of the problem, background and problem definition or statement of the problem. Thus, theory is an abstract generalization that presents a systematic explanation about the relationships among phenomena[15].

Concept is defined as a complex mental formulation of an object properly event that is derived from individual perception and experience[16]. Conceptual framework is interrelated concepts or abstractions that are assembled together in some rational scheme by virtue of their relevance to common and sometimes referred to as conceptual scheme[16]. The conceptual framework selected for this study is modified conceptual framework based on revised Pender's (2002) and otava charter (1986) health promotion model.

The health promotion model proposed by Pender defines health as a positive, dynamics state not merely the absence of disease. The health promotion model was designed to be a "complimentary counterpart to models of health protection" health promotion is directed at increasing a client's level of well being. The health promotion model describes the multi-dimensional nature of persons as they interact within their environment to peruse health. The model focuses on the three functions of a client's cognitive perceptual factors (individual perceptions), individual characteristics and experience and behavioral outcome[16].

According to this model, activity related to cognition and affect is individual's response to awareness questionnaires. The individual characteristics are age, sex, religion, educational qualification, type of hospital working, Experience in Neonatal Intensive care unit. According to this model people move back and forth in a reciprocal fashion in knowledge and practice regarding infection control measures in the neonatal intensive care unit.

The outcome shows the knowledge and practice regarding infection control measures in the neonatal intensive care unit whether it is inadequate, moderate or adequate. Health promotion model is to bring out the improvement in the knowledge and practice of the nursing staffs regarding infection control measures in the neonatal intensive care unit through the administration of Planned teaching programme.

OBJECTIVE OF THE STUDY:

- To assess the knowledge regarding infection control measures in neonatal intensive care unit among nursing staffs
- To assess the practice of nursing staffs regarding infection control measures in neonatal intensive care unit.
- To evaluate the effectiveness of structured teaching programme on knowledge and practice among nursing staffs regarding infection control measures.
- To determine the association between knowledge and practice of nursing personnel with selected demographic variables. Such as age, sex, educational qualification.

METHODOLOGY:

Research methodology aims at helping the researcher to answer the research questions effectively, accurately and economically, studying how research is done scientifically.[46]

This chapter deals with the description of methodology and the different steps undertaken for gathering and organizing data for investigation. It includes the researcher approach, research design, study setting, population, sample and sampling technique, data collection method, development and description of tool, validity, reliability, data collection procedure and plan for data analysis and assessing the effectiveness of STP on the knowledge and practice based on the statement and objectives of the study.

RESEARCH APPROACH:

This chapter deals with type of research approach used in the setting of the study. According to Polit and Hungler the classical approach for the conduct of evaluation research consists of four broad phases

- ✓ Determining the objective of the programme
- ✓ Developing a means for measuring the attainment of these objectives
- ✓ Data collection and interpreting data in terms of the objective
- ✓ In the analysis of data the difference of initial and terminal measurements represent the effect of the independent variable

In view of the nature of the problem selected for the study and objective to be accomplished, an evaluation research was considered an appropriate research approach for the present study.

RESEARCH DESIGN:

The purpose of a design is to achieve a greater control and thus improve validity of the study in examining the research problem. Design has been developed by researchers to meet unique research needs as they emerged.

The present study to assess the effectiveness of Planned teaching programme on Knowledge and Practice regarding infection control measures in neonatal intensive care unit among nursing staffs working in selected Hospitals at Bangalore. Hence in the view of the nature of the problem selected for the present study, pre-experimental one group pretest and posttest design was considered as an appropriate one.

The study was conducted in selected Hospitals at Bangalore. This setting was chosen on the basis of investigator's feasibility, in terms of availability and accessibility of Nursing staffs.

POPULATION:

Population is defined as the entire aggregation of cases that meet a designated set of criteria (Polit and Hungler, 1999). All the lactating mothers in selected Hospital under the study area of Bangalore constitute the target population for the study.

SAMPLING:

Sampling technique: According to Polit and Hungler, sample is subset of a population selected to appropriate in a research study. The process of selecting a portion of the population to represent the entire population of the study compress of 60 nursing staffs in selected hospitals at Bangalore. The Convenient sampling technique was used.[46]

Sample Size: The study originated with a sample of 60 nursing staffs as a sample size for explicating the effectiveness of planned teaching programme on knowledge and practice regarding infection control measures in neonatal intensive care unit among nursing staffs in selected hospitals at Bangalore.

DATA COLLECTION TECHNIQUE:

A structured questionnaire was selected as appropriate method of data collection for the study. This method is applicable for the Nursing staffs and a good deal of information could be obtained by administering structured questionnaire to the Nursing staffs.

DEVELOPMENT OF THE TOOL:

The investigator developed the questionnaire tool used in nursing research: principle and methods, corrections were made by experts. The instrument used for data collection was structured questionnaire to assess the effectiveness of planned teaching programme on knowledge and practice regarding infection control measures in neonatal intensive care unit.

The structured questionnaire consisted of two parts:

Part I: This part deals with demographic characteristics of the Nursing staffs such as age, religion, educational qualification, numbers of years in the hospital, number of years worked in NICU etc and this was not scored but used for descriptive analysis.

Part II: It consists of 26 structured questionnaires to assess the knowledge and practice of nursing staffs regarding prevention of infection in the neonatal intensive care unit. Each correct answer was given a score of one (1) and the wrong answer was given a score of zero (0).

Score interpretation:

The instrument consists of 26 multiple choice questions regarding infection control measures in Neonatal intensive care unit. The maximum score was 26 and the minimum score was 0. Based on the scoring the percentage of knowledge and practice score was calculated using the formula

Obtained score/ total score X 100

The scores were interpreted as follows

- <50- Inadequate
- 51 to 75- Moderately adequate
- >75- Adequate

Organization of the content of the PTP:

Objectives were distributed under following learning area. The components included in the PTP are.

- General information.
- Definition.
- Types.
- Causes
- Nosocomial Infection
- Infection prevention and control
- Standard precaution
- Additional precaution

Development of criteria checklist:

Criteria checklist was prepared to develop PTP based on the literature review and the opinion of experts. The criteria checklist consisted of statements under the board headings.

- Development of the content.
- Preparation of PTP
- Establishment of content validity of PTP.
- Planning for teaching.

RESULTS:

This chapter deals with the quantitative results of the study attempted to assess the knowledge and practice among a sample of 60 nursing staffs on Infection control measures in Neonatal intensive care unit. The collected data were organized, tabulated, analyzed and interpreted by means of tables and graphs under following sections.

Plan for data analysis

The term analysis refers to a number of closely related operations, which are performed with the purpose of summarizing the collected data and organizing the data in such a manner that they answer the research questions. Data collected was analyzed by using descriptive and inferential statistics.

Part I: Description of demographic characteristics of the sample.

Section A Frequencies and Percentage Analysis

In this section the description of socio-demographic variables of the subjects are portrayed.

Distribution of the nursing staffs according to their age depicts that the higher percentage (38.33%) of the staff nurses i.e.; 23 are of the age group > 30 and 35% of the staff nurses i.e.; 21are in the age group less than 25 and 26.67% of the staff nurses i.e.; 16 are in the age group of 25 to 30. Highest percentage of the nursing staffs 81.67% (49) are females and about 18.33% (11) of the nursing personnel are males. Highest percentage of the nursing personnel 41.67% (25) belong to Christian religion, whereas 36.67% (22) belong to Hindu religion and a very low percentage of nursing personnel 21.67% (13) belong to Muslim religion. Highest percentage of the nursing personnel 66.67% (40) of the nursing staffs are GNM and about 21.67 % (13) of the nursing staffs are ANM and a very low percentage of the nursing personnel 11.67% (7) are B.Sc. nurse. And it also depicts that about 51.67% (31) of the nursing personnel are working in private hospitals and about 48.33% (29) of the nursing personnel are working in government hospital. Neonatal Intensive Care unit depicts that a higher percentage of the nursing personnel 43.33% (26) have worked in an NICU for less than or equal to 1 year, and about 31.67% (19) have worked for a period of more than 1 year in NICU and a very low percentage 25% (15) have not worked in an NICU.

Section B Descriptive Analysis

In this section the aspect wise analysis of the level of knowledge of the nursing staffs before and after PTP as well as the mean and SD are calculated to assess the knowledge and practice of the nursing staffs regarding infection control measures in neonatal intensive care unit.

Section C Inferential Analysis

In this section chi-square is used to find the association of selected socio demographic variables with knowledge and practice on infection control measures in neonatal intensive care unit.

Table 1: Analysis of the knowledge of nursing staffs before and after PTP

N=60

Knowledge on infection control measures	Inadequate		Moderately adequate		Adequate		Total	
	Number	%	Number	%	Number	%	Number	%
Pre-test	47	78.33	13	21.67		0.00	60	100.00
Post-test	1	1.67	8	13.33	51	85.00	60	100.00

In the present study during the pre-test, 78.33% (47) of nursing personnel had inadequate knowledge and 21.67% (13) of the nursing personnel had moderately adequate knowledge. While in the post test, 85% (51) of the nursing personnel had adequate knowledge on infection control measures in neonatal intensive care unit and 13.33% (8) had moderately adequate knowledge and 1.67% (1) had inadequate knowledge.

Table 2: Analysis of the practice of the nursing staffs before and after PTP

N= 60

Practices on infection control measures	Inadequate		Moderately adequate		Adequate		Total	
	Number	%	Number	%	Number	%	Number	%
Pre-test	59	98.33	1	1.67		0.00	60	100.00
Post-test		0.00	35	58.33	25	41.67	60	100.00

In the present study during the pre-test, 98.33% (59) had inadequate knowledge on practice of infection control measures in neonatal intensive care unit, and 1.67% (1) had moderately adequate knowledge. While in the post test, 41.67% (25) had adequate knowledge on practice of infection control measures in the neonatal intensive care unit, and 58.33% (35) had moderately adequate practices regarding prevention of infection in the neonatal intensive care unit.

Table 3: Distribution of descriptive statistics of knowledge score of the nursing staffs before and after PTP

N= 60

Knowledge on infection control measures	Max.score	Mean	SD	Mean %	Percentage of enhancement
Pre-test	10	3.95	1.84	39.50	123.29
Post-test	10	8.42	1.11	84.17	

Comparison of the pretest and posttest knowledge scores shows that during the pretest the mean score was 3.95 with a standard deviation of 1.84 and mean percentage was 39.50 after the administration of the planned teaching programme the mean score was 8.42 with a standard deviation of 1.11 and mean percentage of 84.17 percentage the comparison of these two score shows an enhancement of 123.29 in the knowledge scores regarding prevention of infection in the neonatal intensive care unit.

Table 4: Distribution of descriptive statistics of practice score of the nursing Staffs before and after PTP

N= 60

Practices on infection control measures	Max.score	Mean	SD	Mean %	Percentage of enhancement
Pre-test	16	3.88	1.96	24.27	218.30
Post-test	16	12.35	1.54	77.19	

Comparison of the pretest and posttest practice scores shows that during the pretest the mean score was 3.88 with a standard deviation of 1.96 and mean percentage was 24.27 after the administration of the planned teaching programme the mean score was 12.35 with a standard deviation of 1.54 and mean percentage of 77.19 percentage the comparison of these two score shows an enhancement of 218.30 in the practice scores regarding prevention of infection in the neonatal intensive care unit.

Table 5: Comparison between pre- and post- test results of the nursing personnel's knowledge regarding prevention of infection in neonatal intensive care unit.

N= 60

Knowledge on infection control measures	Mean	SD	t-value	P-value	Inference
Pre-test	3.95	1.84	16.266	0.001	HS
Post-test	8.42	1.11			

It is observed from the present study that the mean as well as the standard deviation of the knowledge on prevention infection in the neonatal intensive care unit during the pretest is 3.95 and 1.84 and during the posttest it is 8.42 and 1.11. The difference in the mean knowledge score on prevention of infection is statistically highly significant (<0.001)

Table 5: Comparison between pre- and post- test results of the nursing staff's practice regarding prevention of infection in neonatal intensive care unit.

N= 60

Practices on infection control measures	Mean	SD	t-value	P-value	Inference
Pre-test	3.88	1.96	30.055	0.001	HS
Post-test	12.35	1.54			

It is observed from the present study that the mean as well as the standard deviation of the knowledge on preventive practices during the pretest is 3.88 and 1.96 and during posttest is 12.35 and 1.54. The difference in the mean pre and posttest knowledge on preventive practices is found to be highly significant (<0.001)

Section C- Determining the relationship of level of knowledge and practice with the selected demographic variables

The present study conclude that during the pretest the Chi- Square value computed for the age, sex, religion, educational qualification, type of hospital working, experience in the neonatal intensive care unit, with the level of knowledge is statistically not significant which indicates that there is no association between the knowledge score and the demographic variables in relation to the knowledge. While during the posttest the Chi- Square value computed for the age, sex, religion, educational qualification, type of hospital working, experience in the neonatal intensive care unit, with the level of knowledge is statistically not significant which indicates that there is no association between the knowledge score and the demographic variables in relation to the knowledge. The study also conclude that during the pretest the

Chi- Square value computed for the age, sex, religion, educational qualification, type of hospital working, with the level of knowledge on practice of prevention of infection in neonatal intensive care unit is statistically not significant which indicates that there is no association between the knowledge score and the demographic variables in relation to the knowledge on practice. Whereas it shows that the experience of the nursing personnel in the neonatal intensive care unit was found to be significant with the knowledge on prevention of infection in the neonatal intensive care unit. While during the posttest the Chi- Square value computed for the age, sex, religion, educational qualification, type of hospital working, with the level of knowledge on practice of prevention of infection in neonatal intensive care unit is statistically not significant which indicates that there is no association between the knowledge score and the demographic variables in relation to the knowledge on practice. Whereas it is evident from the table that the experience of the nursing personnel in the neonatal intensive care unit was found to be significant with the knowledge on prevention of infection in the neonatal intensive care unit.

MAIN FINDINGS OF THE STUDY:

Findings related to socio demographic variables.

- 38.33% of the nursing staffs were above 30 years of age
- 81.67% of the nursing staffs were females
- 41.67% of the nursing staffs were Christians
- 66.67% of the nursing staffs were G.N.M
- 51.67% of the nursing staffs were working in private hospital
- 43.33% of the nursing personnel had less than equal to one-year experience in the neonatal intensive care unit.

Findings related to knowledge of nursing staffs regarding infection control measures in the NICU

In the present study it was found that the overall mean score of the nursing personnel on knowledge on infection control measures in the neonatal intensive care unit is during the pretest shows that 78.33% (47) of nursing personnel had inadequate knowledge on prevention of infection in neonatal intensive care unit and 21.67% (13) of the nursing personnel had moderately adequate knowledge on prevention of infection in the neonatal intensive care unit.

The Level of knowledge of the nursing personnel on prevention of infections in neonatal intensive care unit during posttest shows that 85% (51) of the nursing personnel had adequate knowledge on prevention of infection 13.33% (8) had moderately adequate knowledge and 1.67% (1) had inadequate knowledge regarding prevention of infection in the neonatal intensive care unit.

Findings related to knowledge on practice of nursing staffs regarding infection control measures in the NICU

In the present study it was found that the overall mean score of the nursing personnel on knowledge on preventive practices on infection control measures in neonatal intensive care unit is during the pretest shows that 98.33% (59) had inadequate knowledge on practice of prevention of infections in neonatal intensive care unit, and 1.67% (1) had moderately adequate knowledge on preventive practices in neonatal intensive care unit.

The Level of practice of the nursing personnel during the posttest shows that 41.67% (25) had adequate practices regarding prevention of infection in the neonatal intensive care unit, and 58.33% (35) had moderately adequate practices regarding prevention of infection in the neonatal intensive care unit.

Findings related to association between knowledge and selected socio demographic variables.

In order to examine the association between knowledge and selected socio demographic variables, chi-square test was worked out. Among these variables accounted for association, the variables age ($\chi^2 = 2.399$, df = 2), sex, ($\chi^2 = 0.825$, df = 1), religion ($\chi^2 = 1.422$, df = 3), educational qualification ($\chi^2 = 1.834$, df = 1), type of hospital working ($\chi^2 = 1.025$, df = 1), experience in neonatal intensive care unit ($\chi^2 = 1.771$, df = 2), were not found to be statistically significant at 5% level i.e., $P > 0.05$. It evidenced that the knowledge of nursing personnel on infection control measures is not influenced

by sex and type of family etc. In order to examine the association between knowledge on practice and selected socio demographic variables, chi-square test was worked out. Among these variables accounted for association, the variables age (χ^2 = 5.393, df = 2), sex, (χ^2 =0.825, df = 1), religion (χ^2 = 1.791, df = 3), educational qualification (χ^2 = 0.287, df = 1), type of hospital working (χ^2 = 0.297, df = 1), were not found to be statistically significant at 5% level i.e., P > 0.05. It evidenced that the knowledge of nursing personnel on infection control measures is not influenced by sex and type of family etc.

CONCLUSION

The following conclusions were drawn on the basis of the present study to assess the effectiveness of Planned teaching programme on Knowledge and Practice regarding infection control measures in neonatal intensive care unit among nursing staffs working in selected Hospitals at Bangalore. This section brings about the limitations of the study into practice. The findings of the study have several implications on nursing practice, nursing administration, nursing education and nursing research.

The study shows that the nursing staffs are having inadequate knowledge on infection control measures in the neonatal intensive care unit.

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