

# Existing Knowledge and Selected Practices Regarding Infection Control Measures among NICU Nurses

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**Abstract:** A study to assess the existing knowledge and selected practices regarding Infection Control Measures among NICU staffs in selected hospitals of Sangli Miraj Kupwad Corporation area” was conducted to assess the existing knowledge and selected practices regarding Infection Control Measures among NICU Staffs of selected Hospitals. The study adopted ‘Ida Jean Orlando nursing process’ as the theoretical base for framework of the study. A self structured questionnaire and observation checklist was used. A non experimental exploratory study enrolling 60 NICU staffs was conducted during August and September 2013. Non probability purposive sampling technique was adopted. Analysis was done using frequency and percentage distribution and fisher’s exact test. **Findings** -It was found that majority of the staffs 56.7% were having good knowledge score, 38.3% were having excellent knowledge score. In assessment of hand hygiene technique it showed that that 51.7% had good hand hygiene practice, 45% were having average practices. It was found that 100% of samples used sterilized articles, only 55% washed their hands after entering the unit, 30% washed hands before handling the baby, 55 % washed hands after handling the baby. It was found that there is significant association between designation and selected practice score as the Fishers exact value is 0.006 which is less than 0.05. **Conclusion**-The study found that in spite of good knowledge scores, the practices were lacking.

**Keywords:** Knowledge, Practices, Infection Control, NICU, Nurses.

## 1. Introduction

Learning is the addition of new knowledge and experience Interpreted in the light of past knowledge and experience. Teaching and learning is an integral part of nursing. Nurses have the responsibility to educate patients related to various aspects and keep themselves updated. Various teaching strategies are used to increase knowledge, such as lecturing, demonstration, discussion and self-education. These methods of self-education has an advantage over the others as the learner can educate himself at his own pace and it also stresses on rereading [1]. Nurses constitute the largest percentage of the health care workers (HCW) [2] and they are the “nucleus of the health care system” [3]. Because they spend more time with patients than any other HCWs, their compliance with hand washing guidelines seems to be more vital in preventing the disease transmission among patients. Hospital acquired infections results in higher morbidity, mortality, and additional costs. It is well recognized that the risk of transmission of pathogens when providing medical care and the incidence of Hospital acquired infections can be kept low through appropriate standardized prevention procedures. However, it has been well documented that the level of compliance with the use of proven HAI measures by healthcare workers (HCWs) has been disappointing [4] In study highlights the urgent need for introducing measures in order to increase the knowledge, attitudes, practices Teaching Hospital, which may play a very important role in increasing hand hygiene compliance among the staff and reducing cross transmission of infections among patients[5].

Bacterial pathogens that cause neonatal infections are varied and identity of each may be suggested by timing of infection,

presentation of signs and symptoms and response to empirically prescribed antibiotics. The two temporal categories of acute neonatal bacterial infection are early and late sepsis [6].

Early onset sepsis occurs during first 3 days after birth in 1 to 10 per 1000 live births in the west and incidence is 10 to 20 cases per 1000 live births in India. Although the majority occur in term infants, the likelihood of infection is greater among preterm infants. Gram negative organisms have become the most common pathogens, accounting for nearly 2/3<sup>rd</sup> of all infections. Escherichia coli, Klebsiella are the commonest organisms. Among Gram positive causative organisms, GBS is the most common in the west. In India however, GBS infection is uncommon. Staphylococcus aureus infection is far more common gram positive causative organism in India [6].

Preterm and term infants with various Medical and surgical conditions are at greater risk for late onset sepsis. More than 20% infants with birth weight <1,500 grams will have at least one episode of late onset sepsis. It is mostly due to horizontally transmitted nosocomial infection usually from invasive techniques [6].

Although the mortality from sepsis has diminished but the incidence of septicemia is not. Other factors increasing the risk of infection are prematurity, congenital malformations, acquired injuries, invasive procedures and nosocomial exposure to a number of pathogens in NICU. Though hand washing is the single important infection control measures in NICU, Proper handling of formula and supplies such as syringes, tubes etc are also vital to prevent infection. Along

with these Breastfeeding has a protective benefits against the infection and should be promoted for all the newborns[6]. Overall pre-test knowledge about prevention of Nosocomial infection was average. Post-test result showed significant improvement in the level of knowledge on prevention of Nosocomial infection[7].Based on the analysis of findings of the study there was evident increase in the knowledge scores among staff nurses in the study after administration of video assisted teaching program[8].

According to the Centers for disease control and prevention, approximately 2 million patients develop (HAI) Nosocomial infections. These infections occur when there is interaction among patients, health care personnel, equipment and bacteria (Quality, equipment Hold,"2006) Nosocomial infections are preventable if care givers practice meticulous cleaning and disposal techniques[6]. The revised guideline contains two levels of precautions. Standard precautions synthesize the major features of universal Precautions and Body substance Isolation and transmission based precaution.

The nursing management of people with blood borne diseases involves the risk of occupational hazards to health care workers. As student health care workers become more involved in patient contact during their training, they are at risk of exposure to blood borne pathogens [9].

According to the survey of causes of deaths scheme 2012, Sangli district accounts for total Neonatal mortalities of 10.5 per 1000 live births of. Out of which 9.1 has been estimated as early neonatal mortality rate (0-7 days) and remaining 1.4 per 1,000 live births has been estimated as the late neonatal mortality rate (8-28 days) [10].

Sepsis continues to be the major cause of morbidity and mortality in newborns particularly in low birth weight infants [11].

Staffs in India are overburdened with many patients and the nurse patient ratio is not maintained properly, the staffs are not able to provide proper care to the patients thus leading to infections and thereby contributing to Neonatal morbidity and mortality. Even if the staff have knowledge but the practices are not being followed in NICU. Thus with this background and with personal experience, the researcher felt the need of assessing the existing knowledge and selected practice regarding Infection Control Measures in an attempt to develop a Planned teaching programme.

## 2. Statement of the Problem

“A study to assess the existing knowledge and selected practices regarding infection control measures among NICU staffs in selected hospitals of Sangli Miraj Kupwad Corporation Area.”

## 3. Objectives of the Study

1)To assess the existing knowledge and selected practices regarding Infection Control Measures among NICU Staffs of selected Hospitals.

2)To find out the association of test scores of the knowledge and selected practices with the selected socio demographic variables.  
3)To make an attempt to develop a planned teaching programme regarding Infection Control Measures in NICU.

## 4. Operational Definition

### 1. Assess

In this study, “assess means gathering information through structured questionnaire and observation with the help of observation checklist regarding Infection control Measures among NICU Staffs.”

### 2. Knowledge

In this study, “Knowledge refers to expressed opinions to knowledge questionnaires regarding Infection Control Measures in NICU.”

### 3. Practice:

In this study “Practice refers to Hand hygiene techniques, disinfection of articles, Use of gown and slipper.”

### 4. Staff

In this study “staffs means employees working in NICU i.e. Doctors and Nurses.”

### Assumptions

The staffs working in NICU have some knowledge and practices regarding Infection Control Measures.

### Delimitations

Study was limited to short period of time.

### Sampling Criteria:

### Inclusion Criteria

- 1) Staffs working in NICU
- 2) Staffs who knows English or Marathi

### Exclusion Criteria

- 1) NICU Staff unavailable during data collection.
- 2) Staffs who are not willing to participate.

## 5. Review of Literature

Review of related literature is the key step in research process. It refers to an extensive, exhaustive and systematic examination of publications relevant to the research project. One of the most satisfying aspects of the literature review is the contribution it makes to the new knowledge before delivering into a new area of study while conducting a study, when interpreting the results of the study and when making judgement about the application of a new knowledge in nursing practice[12].

### Literature Related To Nosocomial Infection In Newborns

The article was published on “Unit Based Procedures: Impact on the Incidence of Nosocomial Infections in the Newborn Intensive Care Unit”. It emphasized to examine the effects of

common procedures on the incidence of nosocomial infections. Unit based procedures included visitation, hand washing and nail care, skin and cord care, maintenance of hubs in peripheral and central lines, gowning and isolation procedures, use and misuse of antibiotics and unit design and staffing. They found that overall infection rate ranged from 8.9 to 62 infections per 1000 patient days or 6 to 25% of the NICU population [13].

A cohort study was conducted at Kasturba Medical College, Mangalore to determine the profile and risk factors of neonatal nosocomial infections and determine the antibiotic susceptibilities of these isolates. Samples were the neonates admitted for more than forty-eight hours in the NICU, who developed infections/ sepsis as evidenced by the clinical findings were included in the study. It was found that the Extended spectrum beta lactamase (ESBL) producing *Klebsiella* species and Methicillin resistant *Staphylococcus aureus* (MRSA) were the predominant nosocomial pathogens and significant risk factors included prematurity, low birth weight and increased duration of hospital stay. It was also concluded that a revised infection control program with emphasis on hand washing techniques and antibiotic cycling helped to control these hospital infections[14].

The study was conducted on “*Pseudomonas aeruginosa* in a neonatal intensive care unit: molecular epidemiology and infection control measures. It was concluded that *Pseudomonas aeruginosa* infections in the NICU were caused by the cross transmission of an epidemic clone in 4 neonates and sporadic clones in 7 other. An infection control programme that included active surveillance and strict adherence to hand disinfection policies was effective in controlling NICU acquired infections and colonizations caused by *Pseudomonas aeruginosa*[15].

The study was conducted on “Nosocomial infections in a Newborn Intensive Care Unit.” Samples were 904 infants hospitalized for over 48 hours in a regional newborn intensive care unit during 41 months of surveillance. The nosocomial infection rate was 24.6%. among which the surface infections accounted for 40.1% of total, pneumonia 29.3%, bacteremia 14.0%, surgical wound infection 8.1%, UTI 4.5% and meningitis for 4.0%. *Staphylococcus aureus* (47.3%) and gram negative enteric bacilli (45.1%) were the most common organisms recovered. Nosocomial infections were higher in a infant with a birth weight less than 1500 grams. The mortality rate in infants with any nosocomial infection was 33% in contrast to 14% in non infected babies ( $P < 0.001$ )[16].

A cohort study was conducted on “The objectives of the study were to determine the incidence rate and the most frequent sites of infection. Samples were 225 neonates who remained atleast 24 hrs in neonatal intensive care unit were followed up. Neonates with nosocomial infection were identified and presence of risk factor was studied. It was found that the influence rate and incidence density rate were 50.7% and 62 infections per 1000 patients – days respectively. Out of these the sites of infection were pneumonia (40.3%), primary bloodstream (16.7%), skin and soft tissue (14.9%) and meningitis (9.6 %). It was also found

that following risk factors were associated with nosocomial infection ( $P < 0.05$ ) : birth weight, gestational age, mechanical ventilation, total parenteral nutrition, umbilical catheter, use of antibiotics and intubation in delivery room[17].

The article was published on “High neonatal mortality in rural India : What options to explore?” the article concluded that the neonatal mortality rate in India is still high and skewed towards rural areas. Much of the problem lies in the non availability of trained manpower and this inturn influences the quality of care the neonates receive. Urban Rural differences in neonatal mortality exist with the mortality rates higher by 50% in rural (42.5/1000 live births) compared to urban (28.5/1000 live births) areas, as per National Family Health Survey (NFHS-3) the common cause of neonatal deaths in India were infections, birth asphyxia and prematurity which contribute to 32.8%, 22.3% and 16.8% of the total neonatal deaths respectively[18].

#### **Literature Related to Prevention of Infection In Newborns.**

The article was published on “Infection Control in the neonatal intensive care unit”, by Carolyn. She stated on her article that Healthcare associated infection is one of the main causes of adverse events in the neonate. Despite current infection control policies and practices and ongoing education programmes for healthcare workers, HCAI infection rates within the NICU continue to increase, often with devastating results. Teare and Peacock (1996) worked to support and suggested that a link/ liaison system has been successful in raising the infection control profile and changing practice in clinical areas. However, a study by the National Audit Office (NAO) in 2000 found that only 59% of NHS trusts in England were using the infection control link nurse system. 18% of these trusts reported that the system had been unsuccessful, while 7% abandoned the system as a result of high turnover of staff [19].

A comparative study was done on Weekly ventilator Circuit Changes: A Strategy to Reduce Costs without Affecting Pneumonia Rates. In this study ventilator-associated pneumonia rates and costs associated with 48-h and 7-day circuit changes were compared. Ventilator circuits were changed at 48-h intervals during the control period and at 7-day intervals during the study period. Nosocomial pneumonias were prospectively identified using the criteria of the Centers for Disease Control and Prevention. The annual cost difference of changing circuits at 48-h and 7-day intervals was calculated using the distribution of ventilator days for the control and study periods. There were 1,708 patients, 9,858 ventilator days, and a pneumonia rate of 9.64 per 1,000 ventilator days in the control group (48-h circuit changes). There were 1,715 patients, 9,160 ventilator days, and 8.62 pneumonias per 1,000 ventilator days when circuits were changed at 1-week intervals (study group). Using a logistic regression model, there were significantly greater odds of developing a ventilator-associated pneumonia in surgical patients and patients in critical care units, but no significant risk of ventilator-associated pneumonia in patients in whom circuits were changed at 1-week intervals. Changing circuits at 7-day intervals resulted in a 76.6% reduction in the

annual cost for materials and salaries. It was found that there was no difference in pneumonia rates with ventilator circuit changes at 48-h and 7-day intervals. The study concluded that the Ventilator circuits can be safely changed at weekly intervals, resulting in large cost savings [20].

An interventional study was done in University of Alabama at Birmingham to determine if comprehensive infection control (CIC) measures decreases rates in a larger neonatal intensive care nursery. It was found that the baseline infection rate came down from 8.5 per 1000 hospital days to 26% ( $P = 0.002$ ) in the first year and 29% ( $P < 0.001$ ) in the second and third year after the Comprehensive infection control (CIC) intervention [21].

An article was published on Role of hand hygiene in healthcare-associated infection prevention. According to this article Healthcare workers' hands are the most common vehicle for the transmission of healthcare-associated pathogens from patient to patient and within the healthcare environment. Hand hygiene is the leading measure for preventing the spread of antimicrobial resistance and reducing healthcare-associated infections (HCAIs), but healthcare worker compliance with optimal practices remains low in most settings. This paper reviews factors influencing hand hygiene compliance, the impact of hand hygiene promotion on healthcare-associated pathogen cross-transmission and infection rates, and challenging issues related to the universal adoption of alcohol-based hand rub as a critical system change for successful promotion. The article also reviewed that the widespread use of alcohol-based hand rubs in healthcare settings has been blamed repeatedly for the increase in *Clostridium difficile*-associated disease rates. Available evidence highlights the fact that multimodal intervention strategies lead to improved hand hygiene and a reduction in HCAI. However, further research is needed to evaluate the relative efficacy of each strategy component and to identify the most successful interventions, particularly in settings with limited resources. The main objective of the First Global Patient Safety Challenge, launched by the World Health Organization (WHO), is to achieve an improvement in hand hygiene practices worldwide with the ultimate goal of promoting a strong patient safety culture [22].

## 6. Research Methodology

### Research Approach

The Research approach adopted for the study was Quantitative research approach.

### Research Design

The research design adopted was Non Experimental Exploratory Descriptive research design.

### Setting of the Study

The study was proposed to be conducted in selected Hospitals of Sangli Miraj Kupwad Corporation area named Bharati Hospital, Wanless Hospital, Vasantdada Patil Government hospital and Government Medical College and Hospital Miraj.

### Population

In this study, population consisted of staffs working in NICU.

### Sample and Sampling Technique

The sample for the study consisted of 60 staffs working in NICU of selected hospitals at the time of data collection. Non probability purposive sampling technique was chosen.

### Sample Size

Sample size for this study was calculated as 45.

### Description of the Tool

It comprises of III Sections

SECTION I consisted the socio-demographic data like Professional Qualification, Working experience in NICU, Designation, Inservice education attended and awareness regarding Infection control policy in NICU.

SECTION II: A knowledge questionnaire regarding Infection Control Measures.

SECTION III: An observation checklist.

### Validity

To ensure the validity of the tool it was submitted to 16 experts along with the questionnaire and the observation checklist.

### Reliability

The reliability coefficient for questionnaire was 0.81, 0.99 for observation checklist I and 1 for observation checklist II as it was above 0.7, the tool prepared was found to be reliable.

### Pilot Study

A pilot study was conducted from 17/8/13 and 18/8/13 to assess the feasibility of the study and to decide on a plan for statistical analysis. The pilot study did not show any major flaw in the design of observation checklist and the questionnaire.

### Collection of Data

Formal administrative permission was obtained from Padmabhushan Vasantdada Patil Government hospital, Bharati Hospital, Wanless Hospital and Government Medical College and Hospital, Miraj. Dean and NICU Incharge of the Hospital were contacted and explained about the study. The study was conducted from 27/8/13 to 13/9/13. The investigator personally contacted each subject and the informed consent was obtained after explaining the purpose of the study. Questionnaire was administered to the subjects; they were asked to fill and were collected within 15 minutes and the investigator waited in the setting for observation. The investigator collected samples for 4-5 days from each hospital during the three shifts.

## 7. Findings of the Study

### Section I

**Professional Qualification:** It was found that 6.7% of staffs were A.N.M, 13.3% of the samples were B.Sc, 65% i.e. majority of them were G.N.M, 5% were M.B.B.S, 6.7% were

M.B.B.S D.C.H, and remaining 3.3% were M.B.B.S and M.D pediatrics.

**Working Experience in NICU:** It was found that majority i.e. 80% of samples had an experience of less than 3 yrs, 11.7% of them had 3-6 yrs of experience, 3.3% of them had 6-10 yrs of experience, and 5% of the samples had more than 10 years of experience.

**Designation:** 15% were Resident Doctors, 5% were Sister Incharge, and majority of them i.e. 80% were staff nurses.

**Inservice education attended:** 46.7% of the staffs had attended the inservice education whereas remaining 53.3% had not attended.

**Awareness regarding Infection Control Policy in NICU:** 81.7% of the samples were aware and remaining 18.3% were not aware regarding infection control policy in their NICU.

## Section II

### Existing knowledge of NICU staffs regarding Infection Control Measures.

Structured questionnaire was used to collect data. The total score was 20 and was divided as 0 – 5 (poor knowledge scores), 6 – 10 (average knowledge score), 11 – 15 (good knowledge score) and 16 – 20 (Excellent knowledge score). It was found that majority of the staffs (56.7%) were having good knowledge score, 38.3% were having excellent knowledge score and remaining 5% were having average knowledge score.

## Section III

### Selected practices regarding Infection Control Measures among NICU Staffs of selected Hospitals.

It consisted of two parts. Part I comprised of assessment of hand hygiene practice scores. Total practice were 12 and was divided as 0 – 3 (poor hand hygiene practice), 4 – 6 (average hand hygiene practice), 7 – 9 (good hand hygiene practice) and 10 – 12 (excellent hand hygiene practice). It was found that 51.7% had good hand hygiene practice, 45% were having average practices whereas only 3.3% had excellent practice scores.

Part II comprised of selected practices, it was found that 100% of staffs removed footwear's before entering the unit, 100% wore NICU slippers, only 55% washed their hands after entering the unit, 75% of them wore gowns/ special uniform, 30% washed hands before handling the baby, 55 % washed hands after handling the baby, 73.33% washed hands before and after procedure, 100 % used sterilized articles, 73.3% removed gown before leaving the NICU, and 98.33% removed foot wears before leaving the NICU.

## Section IV

### Association between the knowledge and practice scores with the selected demographic variables

As per the professional qualification, 4 samples were A.N.M, out of those 1 (25%) had average knowledge score, 1(25%)

had good knowledge scores and 2 (50%) had excellent knowledge score. 39 samples were G.N.M, out of those 2(5.1%) had average knowledge, 27 (69.2%) had good knowledge and 10 (25.6%) had excellent knowledge score. 8 samples were B.Sc nurses, out of those 3 (37.5%) were having good knowledge score and 5 of them had the excellent knowledge score. 3 samples were M.B.B.S, out of 3, 1 (33.3%) had good knowledge score and the other 2(66.7%) had excellent knowledge score. 4 samples were M.B.B.S, D.C.H, out of 4, 2 had good knowledge score and the other 2 had excellent knowledge score. the remaining 2 were M.B.B.S, M.D pediatrics both of them had excellent knowledge score. The study found that there is no association between professional qualification and knowledge scores as the fisher's exact value is more than 0.05.

As per the working experience in NICU(48) 80% of the sample belong to less than 3 years of experience, out of 48 samples, 2(4.2%) samples had average knowledge score, 29(60.4%) were having the good knowledge score, and remaining 17(35.4%) were having the excellent knowledge score. (7)11.7% of the samples were having working experience of 3-6 years, out of 7, 1(14.30%) belonged to the category of average knowledge score, 4(57.10%) belonged to good knowledge score and 2(28.60%) had excellent knowledge scores. (2)3.3% of the samples had 6-10 years of experience. Out of these 2, 1 had good knowledge score and the other had excellent knowledge score. (3)5% of the samples had more than 10 year of experience and 3 of them had the excellent knowledge scores. It was found that there is no association between the years of experience in NICU and the knowledge scores.

As per the designation 9(15%) doctors, out of 9, 3(33.3%) had good knowledge scores whereas 6 (66.7%) of them had the excellent knowledge score. 51 (85%) were Nurses. out of 51, 3 (5.9%) had average knowledge score, 31(60.80%) had good knowledge score and 17(33.3%) of them had excellent knowledge score. The study found there is no significant association between the designation and knowledge scores as the fisher's exact value was not less than 0.05

As per the Inservice education attended, 28 (46.7%) answered yes, out of these 28, 2 (7.1% ) of them had average knowledge score, 16 (57.1%) had good knowledge score, and the remaining 10(35.1) had excellent knowledge score. 32 ( 53.3%) answered No, out of those 32 samples, 1(3.1%) had average knowledge score, 18 (56.3%) had good knowledge score, 13 (40.6%) had excellent knowledge score. The majority of the staff who did not attend inservice education was in the group of good and excellent knowledge score as the fisher's exact value was not less than 0.05.

As per the awareness regarding Infection control policy, out of 60 samples 49 were aware of having the infection control policy in their NICU and out of these 49, 3 i.e. 6.1% had average knowledge score, 28 (57.1%) had good knowledge score and remaining 18 (36.7%) had excellent knowledge score. 11 were not aware regarding the infection control policy, out of 11, 6 (54.50%) had good knowledge scores and 5 (45.5%) had excellent knowledge score. The fisher's exact value is 0.8 which is not less than 0.05 that indicates that

there is no association between the infection control policy and the knowledge score

#### **Association of Hand Hygiene practice score with selected demographic variables**

As per the professional qualification, among 4 A.N.M, 3 had average hand hygiene score and 1 had good scores. Among 39 G.N.M staff, 15 (38.5%) had average, 23 (59%) had good and 1 (2.6%) had excellent hand hygiene practice scores. Among 8 B.sc nurses, 4(50%) of them had average hand hygiene, 3(37.5%) had good scores and 1 (12.5%) had excellent hand hygiene practice scores. Among 3 M.B.B.S, 1 had average practice and 2 had good hand hygiene practice scores. 4 were M.B.B.S, D.C.H, 3(75%) had average and 1(25%) had good hand hygiene practice scores. among 2 M.B.B.S, M.D Pediatrics 1 had average and the other 2 had good hand hygiene practice scores.

As per the Working experience (48) 80% of the sample belong to less than 3 years of experience, out of these 23(47.9) had average hand hygiene practice score, 23(47.9) had good hand hygiene practice score whereas only 2 i.e. 4.2% had excellent hand hygiene practice scores. 7 samples were having 3-6 years of experience, out of them, 2 (28.6%) had average practice, 5( 71.4%) had good practice scores. 2 samples were having a working experience of 6-10 years, 2 of them had good hand hygiene practice scores. 3 samples had more than 10 year of experience, among those 2 were having average practice score and 1 was having good practice score.

As per the Designation, 9 were M.B.B.S, Out of these 5 (55.6%) had average practice, 4 (44.4%) had good practice and none of them had excellent hand hygiene practice scores, 51 samples were Nurses. out of 51, 22 (43.2%) had average hand hygiene practice scores, 27 (52.9%) had good hand hygiene practice scores, and 2(3.9%) had excellent hand hygiene practice scores.

As per the Inservice education attended, 28 samples responded Yes, out of those 12(42.9%) of them had average hand hygiene practice scores, 15 (53.6%) had good hand hygiene practice score and 1 had excellent hand hygiene practice scores and remaining 32 responded No, out of those 15 (46.9%) of them had average hand hygiene practice score, 16 (50%) had good hand hygiene practice scores and 1 (3.1%) had excellent hand hygiene scores. It was found that there is no significant association between inservice education and hand hygiene scores as the fisher's exact value was 0.89.

As per the Infection control policy 49 samples responded Yes for having infection control policy in their hospitals, out of those 19(38.8%) had average hand hygiene practice scores, 28 (57%) had good hand hygiene practice score and 2(4.1%) had excellent hand hygiene practice scores. remaining 11 responded No, out of these, 8 (72.7%) had average hand hygiene practice scores and 3 (27.3%) had good hand hygiene practice score. it was found that there is no significant association between infection control policies and hand hygiene practice scores as the fisher's exact value was 0.142.

#### **Association of selected practice scores with selected demographic variables**

As per the professional qualification, among 4 A.N.M, 4 had excellent selected practice scores. Among 39 G.N.M staff 2 (5.1%) had average practice, 17 (43.6%) had good selected practice scores and 20 (51.3%) had excellent selected practice scores and among 8 B.Sc staff, 4 (50%) had good and remaining 4(50%) had excellent selected practice scores. Among 3 M.B.B.S, 3 of them had good selected practice score. Among 4 M.B.B.S, D.C.H 1 (25%) had average whereas 3(75%) had good practice score. Among 2 M.B.B.S, M.D Pediatrics, both of them had good selected practice scores. It was found that there is no significant association between professional qualification and selected practice scores as the fisher's exact value is 0.061 which is less than 0.05.

As per the Designation, out of 9 Doctors, 1(11.1%) had average selected practice score and the other 8 (88.9%) had good practice scores , among 51 Nurses 2 (3.9%) of them had average scores, 21 (41.2%) of them had good practices whereas 28 (54.9%) of them had excellent practice scores. It was found that there is association between designation and selected practice scores as the fisher's exact value is 0.006 which is less than 0.05.

As per the working experience in NICU, 48 samples had the working experience of less than 3 years, 2 (4.2%) of samples had average practices, 26 (54.2%) had good practice scores, 20 (41.6%) had excellent practice scores. 7 samples had experience of 3 – 6 years of experience, 1(14.3%) of them had average practice score, 1 (14.3%) had good practice score, and 5 (71.4%) had excellent practice score. Out of 2 samples having working experience of more than 6 – 10 years, 2 (100%) were having excellent practice scores and 3 sample were having more than 10 years of experience, out of them 2(66.7%) had good practice score and 1 (33.3%) had excellent practice score. It was found that there is no significant association between working experience in NICU and selected practice scores.

As per the Inservice education attended, among 28 samples who responded Yes, 1(3.6%) had average practice, 13 (46.4%) had good practice scores and 14 (50%) had excellent practice score whereas for the samples responded No, 2(6.3%) had average practice score, 16 (50%) had good practice score, 14 (43.8%) had excellent practice score. Hence the staffs who answered yes and No , in both the groups 14 samples were found to have excellent practice. No significant association was found as the fisher's exact value was 0.91.

As per the awareness regarding infection control policy in NICU, 49 samples were aware of having infection control policy in their NICU. Out of them 3(6.1%) had average practice scores, 22(44.9%) had good practice and 24 (49%) had excellent practice score. 11 samples responded No, 7 (63.6%) of them had good practices and 4 (36.4%) had excellent practice scores. No significant association was found between infection control policy and selected practice scores.

## 8. Discussion

Based on the objectives the researcher tried to assess the existing knowledge and selected practices of 60 samples regarding infection control measures.

A similar study was conducted in Isfahan with an objective to assess the Nurse's knowledge of hospital infections and sterilization methods of hands, equipments and surfaces in neonatal wards; it was found that average 63.9% of nurses had the knowledge related to hospital infection.

In the present study, it was found that 56.7% of the staff had good knowledge regarding infection control measures in NICU.

A similar study was done to assess the nature of patient contact and the hand hygiene practices of nurses and physicians in the neonatal intensive care unit in a tertiary hospital in Ghana. Unobtrusive observation was done of patient contact, hand hygiene practices, and hand washing technique among nurses and physicians attending randomly selected newborns for five hours daily for two weeks. Patient contact categorized as low-risk or high-risk. Hand hygiene practice before and after patient contact categorized as clean uncontaminated, clean recontaminated, new gloves, unchanged gloves. Compliance to alcohol rub use was also assessed. It was found that the patient to nurse/physician ratio varied from 9:1 to 12:1. There were 97 patient contacts of which 49 were high-risk and 48 low-risk. Most (73%) patient contacts were from nurses. Compliance to hand hygiene recommendations before versus after patient contact was 15.4% versus 38.5% for physicians and 14.1% versus 9.9% for nurses. The study concluded that Hand hygiene compliance of physicians and nurses was low. The study emphasized on incorporating effective education programs that improve adherence to hand hygiene guidelines into the continuing education curriculum of health professionals is recommended.

In the present study, the study found that compliance to hand hygiene recommendations before versus after handling the baby was 33% before handling the baby and 55% after handling the baby.

The study found that the practices were lacking, the reasons are as follows.

- 1) Inadequate staffing was one of the reasons for the staff for not following the infection control measures. – Need of adequate staffing.
- 2) In spite of having the written infection control guidelines, Staffs were not following the infection control measures. – Need of close supervision.
- 3) The study also found that the practice scores of staffs who attended in-service education were as same as those who didn't attended – Need of continued education programme.

## 9. Conclusion

After the detailed analysis, this study leads to the following conclusions.

Even though the knowledge scores of the staffs were high but the practices scores of the staffs were less. As the infection remains the major cause of mortality amongst newborns, practicing infection control measures remains a major responsibility of the staffs working in NICU.

### Implication

#### In Practice

Health care personnel should enhance their professional knowledge in practice. All the personnel can be provided opportunity to attend in-service education, conferences in order to improve their knowledge and practice. Education and demonstrations regarding infection control measures will help to prevent an infection which remains the main cause of neonatal mortality. Health care personnel have to be more careful in providing care to the newborns. High quality management of knowledge and practice will shorten the stay of newborns and it will contribute to the cost effectiveness of hospital care.

#### In Education

With changing trends in health care, education must emphasize on primary health care approach by focusing on prevention which is better than cure and promotion of health. Education should help in inculcating values and a sense of responsibility of staff towards the clients. Health care personnel should be given opportunity to update their knowledge and practice periodically. For improvement of practice of infection control measures in NICU, regular supervision should be implemented. This shall enhance the professional standards of care and education.

#### In Administration

In the event of ever changing disease manifestations, knowledge explosion, technological and ever-growing challenges of maternal and child health nursing, the administration has a responsibility to provide health care personnel with substantial continuing educational opportunities. This will enable them in updating their knowledge, acquiring special skills and demonstration of high quality care by deputing them for in service education programme. This shall also ensure better professional standards. Special courses, workshops and conferences can be arranged and attended by the all the personnel. Necessary administrative support should be provided for the development of such educational material. Administration must emphasize on written guidelines on infection control or must have an Infection control policies. In the finding, the present study reveals the need of the ongoing education and training programme as well as close supervision of staffs working in NICU. Administrator should also provide needed facilities as well as adequate staff in NICU.

#### In Research

Research is an essential aspect of profession as it uplifts the profession and develops new norms and a body of knowledge. There is a need for extended and intensive research in the area of clinical teaching of the staff regarding infection control measures in NICU.

In highlights the area requires future exploration. The suggestion and recommendation can be utilized for further studies in the same field.

## 10. Limitation

- 1) A limited time available for data collection.
- 2) The investigator had to wait for long hours to observe the practice.
- 3) Even though the topic is very important, the relevant literatures were scanty, as hardly studies are conducted on the topic under investigation.

## 11. Recommendations

On the basis of the finding of the study, it is recommended that,

- 1) A similar study may be replicated on a larger sample for better generalization of findings.
- 2) A similar study can be conducted by implementing the planned teaching programme.
- 3) A comparative study can be done on knowledge and selected practices of staff working in government hospital and private hospital regarding infection control measures in NICU.
- 4) A study including all practices regarding infection control measures may be conducted.

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