A study to assess the effectiveness of self instructional module on prevention of nosocomial infection in Neonatal Intensive Care Unit (NICU) among staff nurses in selected hospitals at Mangalore

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Abstract:

Health care associated infections (nosocomial) are responsible for significant morbidity and mortality among neonatal intensive care patients. The purpose of the study was to assess the effectiveness of Self instructional module in the prevention of nosocomial infection. The study also aimed at improving the knowledge of staff nurses regarding prevention of nosocomial infection. An evaluative approach with one group pre-test post-test design was used in the study.

The result of the study showed that in the pre-test knowledge assessment, the mean percentage of response was 50.73% with mean and SD of 15.223 ± 2.5, which was increased to 92.83% with mean and SD of 27.85± 1.20 in the post-test. The results showed a significant difference suggesting that the self instructional module was effective in increasing the knowledge of staff nurses regarding prevention of nosocomial infection (t =26.82, p<0.05).

Key words: Self Instructional Module, Nosocomial infection, Hospital acquired infection

Introduction:

Nosocomial infections also termed hospital-acquired infections are the infections which develop within hospitals and are produced by microorganisms acquired during hospitalization. It is an infection whose development is favoured by a hospital environment, such as one acquired by a patient during a hospital visit or one developing among hospital staff. All infections in newborns delivered in the hospital need to be considered "acquired" except those caused by organisms reaching the baby from the mother or before the time of birth.[1]

In many developing countries, neonatal mortality rates (deaths in the first 28 days of life) is as high as 40–50 per 1000 live births with infections being the major cause of death. Unfortunately, hospitals in developing countries are at high risk of infection transmission and improvement in neonatal outcomes are subverted by hospital-acquired infections and their associated morbidity, mortality and cost. These infections can be attributed to lack of knowledge and training about basic infection control processes, coupled with inadequate infrastructure, systems of care and resources. This has serious consequences when devices such as intravenous catheters and ventilators are introduced without sufficient attention to the substantial risk of infections they entail.[2]

The risk of nosocomial infection in neonates is the direct consequence of the severity of illness, prematurity, congenital defects, systemic diseases, level of invasive monitoring, indiscriminate use of antibiotics, lapses in sterilization and disinfection techniques and the nature of diagnostic procedures. Hospital-acquired infections are one of the leading causes of preventable morbidity and mortality in neonatal intensive care units. Device-

related infections, such as Catheter-Associated Blood Stream Infections and Ventilator-Associated Pneumonia (VAP) are the most common nosocomial infections.[3] Gram-positive bacteria are the commonest cause of nosocomial infection with *Staphylococcus aureus* being the predominant pathogen. There has been an increase in the rate of antibiotic resistant bacteria associated with nosocomial infections in ICU.[4]

Hospitalized neonates, who may have multiple invasive procedures, exposure to antimicrobial agents and indwelling medical devices are at risk of hospital acquired infections. Innate vulnerabilities such as the immature skin and immune systems of preterm infants, predispose infants to infection even without the added risks related to day-to-day care in the neonatal intensive care unit.[5] Sepsis and meningitis are responsible for most of these deaths. The most common causes of death in the neonatal period are infections, including septicaemia, meningitis, respiratory infections, diarrhoea, and neonatal tetanus (32%), followed by birth asphyxia and injuries (29%), and prematurity (24%).[6]

A cohort study was conducted in Mangalore, Karnataka to determine the profile and risk factors of neonatal nosocomial infections and to determine the antibiotic susceptibilities of these isolates. The study concluded that a revised infection control program with emphasis on hand washing techniques and antibiotic cycling will help to control the hospital infection rates.[3]

To plan effective strategies to reduce the burden of neonatal sepsis, it is essential to define the sources of infection. Therefore, continuous surveillance is essential. Preventive measures need to be implemented. The review of literature reveals that there is lack of knowledge regarding nosocomial infections. Hence, this study was taken up to assess the effectiveness of self instructional module on prevention of nosocomial infection in Neonatal Intensive Care Unit (NICU) among staff nurses in selected hospitals.

Materials and Methods:

The study had an experimental research design. An evaluative approach with one group pre-test post-test design was used in the study. The sample consisted of 30 staff nurses who met the inclusion criteria and were chosen by purposive sampling technique. The study was conducted at two tertiary care hospitals in Mangalore. Data collection was done from 20-10-2013 to 20-11-2013. Data was collected by using structured knowledge questionnaire. On day one, Pre-test was given and the self instructional module was administered on the same day and the post-test was conducted on the seventh day.

The study included staff nurses who are registered nurses and have secured their G.N.M., B.Sc. & PB.B.Sc. Nursing qualifications and working in the Neonatal Intensive Care Unit (NICU). The plan for data analysis was done using both descriptive and inferential statistics on the basis of the objectives and hypotheses of the study. Baseline performance containing sample characteristics was analysed using frequency and percentage. The knowledge of staff nurses on prevention of nosocomial infection before and after the administration of self instructional module was calculated using mean, median, range and standard deviation. The significance of difference between the mean pre-test and post-test knowledge score regarding the prevention of nosocomial infections was calculated using paired 't' test. The association between demographic variables and pre-test knowledge score regarding prevention of nosocomial infection was determined by using Chi-square test.

Results:

As per the frequency and percentage distribution of demographic variables of staff nurses according to their age group, the majority of the staff nurses 14 (47%) were in the age group of 21- 25 years, 9 (30 %) were in the age group of 26- 30 years, 3(10%) were in the age group of 31-35 years and 4 (13%) were above 35 years. The distribution according to their professional qualifications showed that the staff nurses 12(40 %) were with G.N.M. qualifications, 12 (40%) were with B.Sc. Nursing qualifications and 6 (20 %) were with Post-basic.B.Sc. Nursing qualifications. Distribution according to their years of experience showed that 6(20%) had less than 1 year experience, 14 (47%) had 1-3 years of experience, 6(20%) had 3- 5 years of experience and 4 (13%) had more than 5 years of experience.

The effectiveness of the self instructional module with mean percentage knowledge with pre-test and post test knowledge scores of staff nurses was analysed. In the area of 'concept of nosocomial infection' the mean percentage knowledge score in the pre test was 54.33% and in the post test it was 98.66%; the knowledge increase was 44.33%. In the area of 'causes and risk factors' mean percentage knowledge was increased from 55.2% to 94%, knowledge increase was 38.8%. In the area of "methods and pathogenic organisms" mean percentage knowledge score was increased from 47.33% to 89.3; knowledge increase was 41.97%. In the area of 'signs and symptoms' and complications, the mean percentage knowledge score increased from 52.5 % to 92.5%, the knowledge increase was 40%. And in the area of management and prevention, the mean percentage knowledge score increased from 50 % to 94.5%; knowledge increase was 44.5%. The results thus revealed that the overall percentage of post-test mean percentage score was more

compared to pre-test mean percentage score. Hence, it is observed that the self instructional module was effective in improving the knowledge of staff nurses regarding prevention of nosocomial infection (Graph I)

The data represented in Table I shows that the computed' value is greater than the tabled value (tabled value t_{29} is 2.05) at 0.05 level of significance. The computed 't' value shows that there is a significant increase in the post-test knowledge score. On the basis of this, research hypothesis (H_1) was accepted. This indicates that the self instructional module was effective in increasing the knowledge of staff nurses working in NICU in the prevention of nosocomial infections.

Findings of the present study show that there is no significant association between pre-test knowledge scores and selected demographic variables like age ($\chi 2$ =1.1413), professional qualification ($\chi 2$ =0.05625) and years of experience ($\chi 2$=3.1687).

Discussion:

The present study and other studies have shown that educational programmes are helpful in increasing the knowledge of staff nurses in increasing their knowledge on prevention of nosocomial infections. With regard to the pre-test knowledge assessment, the mean percentage of response was 50.73% with mean and SD of 15.223 ± 2.5, which was increased to 92.83% with mean and SD of 27.85± 1.20 in the post-test. It shows that post-test knowledge score is higher than the pre-test knowledge score. The result showed the significant difference suggesting that the self instructional module was effective in increasing the knowledge of staff nurses

Graph 1: Areawise effectiveness of self instructional module with mean percentage knowledge with pre-test and post-test knowledge scores of staff nurses
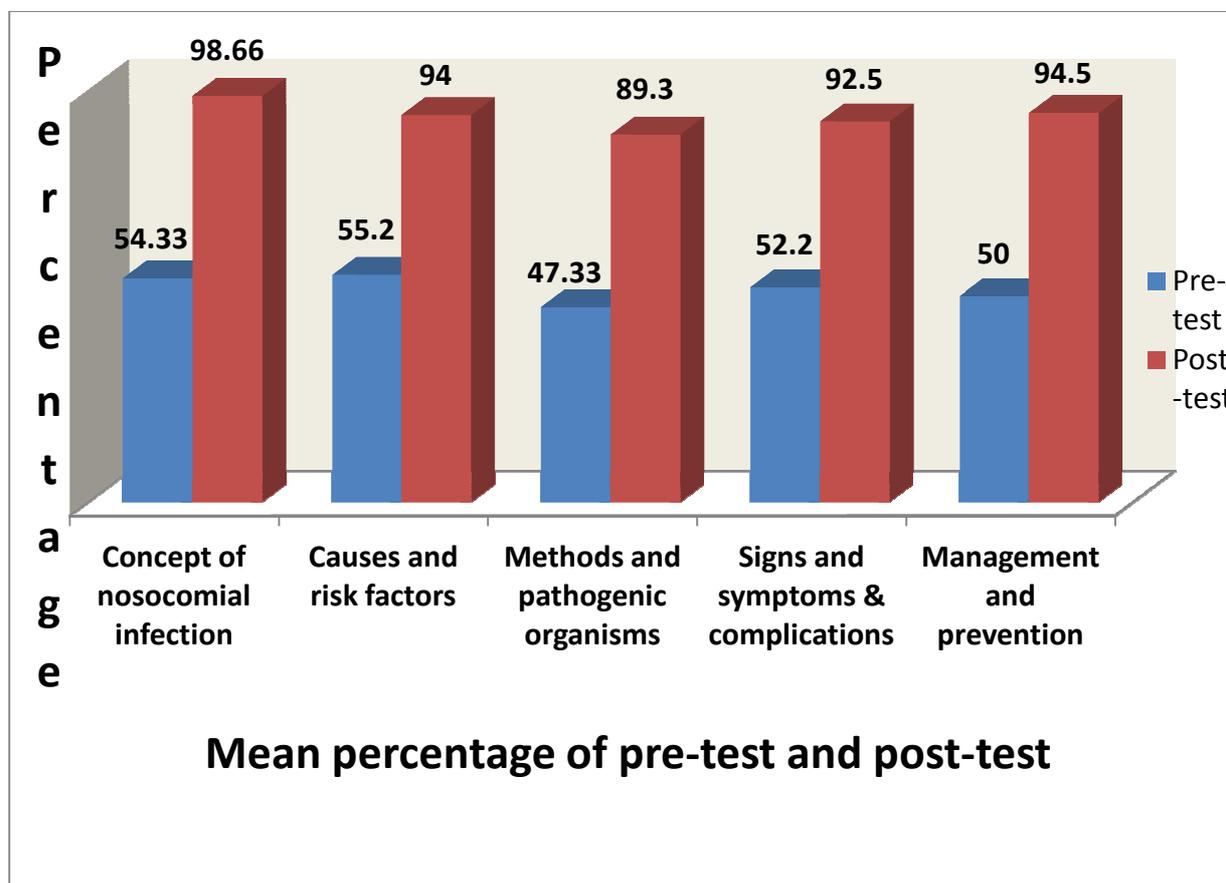

Table 1: Overall effectiveness of Self instructional module with mean, SD, mean percentage and 't' value of pre-test post-test knowledge scores of staff nurses

Parameter	Mean	SD	Mean %	Mean difference	SD difference	't' value
Pre-test	15.23	2.5	50.73%			
Post-test	27.86	1.20	92.83%	12.63	2.57	26.82

(t_{29} = 2.05, p<0.05)

regarding prevention of nosocomial infection (t =26.82, p<0.05). Findings of the present study shows that there is no significant association between pre-test knowledge scores and selected demographic variables like age ($\chi 2$ =1.1413), professional qualifications ($\chi 2$ =0.05625) and years of experience ($\chi 2$=3.1687).

Nursing implications

The present study was conducted to determine the effectiveness of self instructional module in the prevention of nosocomial infections among staff nurses in NICU in selected hospitals at Mangalore. The findings of the present study have implications in the field of nursing education, nursing practice, nursing administration and nursing research. Hospitals should organize programmes such as conducting camps and health education to impart knowledge to the staff nurses. They can also evaluate the conducted programmes and can make necessary steps to make improvements for next time. The nurses should provide proper guidance when new staff comes to neonatal intensive care unit for prevention of nosocomial infections and impart efficient newborn care.

Conclusions

Findings of the study showed that the knowledge of the staff nurses prior to administration of Self Instructional Module was not satisfactory. The Self Instructional Module helped them to learn more about prevention of nosocomial infection. The post-test knowledge score showed significant increase in the knowledge of staff nurses. Hence, the Self Instructional Module was an effective strategy for providing information and in improving the knowledge of the respondents.

References:

1. Gupte S. The short text book of pediatrics.9th edition. New Delhi: Jaypee publications; 2004.
2. Mahfouz AA, Al-Azraqi TA, Abbag FI, Al-Gamal MN, Seef S, Bello CS. Nosocomial infections in a neonatal intensive care unit in South Western Saudi Arabia. Eastern Mediterranean Health Journal 2010; 16(1): 40-44.
3. Kamath S, Mallya S, Shenoy S. Nosocomial infections in neonatal intensive care units: Profile, risk factor assessment and antibiogram. Indian Journal of Pediatrics 2010; 77(1): 37-39.
4. Inweregbu K, Dave J, Pittard A. Nosocomial infections. Continuing education in anaesthesia, critical care and pain 2005; 5(1): 14-17.
5. Cipolla D, Giuffre M, Mammina C, Corsello G. Prevention of nosocomial infections and surveillance of emerging resistance in NICU. J Matern Fetal neonatal Med 2011; 24(Suppl 1): 23-26.
6. Chapman A, Stoll BJ. Prevention of nosocomial infections in the neonatal intensive care unit. Current Opinion in Pediatrics 2002; 14(2): 157-164.

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