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Research article

Planned teaching programme improves knowledge about nosocomial infections among staff nurses in regional centre in Maharashtra

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Abstract

Introduction: Nocosomial infections or hospital infections are increasing in developing countries. There is much need to improve knowledge of healthcare personnel. Objective: To assess nurse's knowledge about nosocomial infection at regional centre in Maharashtra. Methodology: A descriptive study was carried out at regional centre in Maharashtra consisted of 30 nurses who were working as registered nurse in the hospital. The questionnaires was designed and constructed by the researcher according to review of literature and related study. The content validity of the instrument was established through penal of experts. Reliability of the Instrument was determined by a pilot study. Data was gathered by interview technique using the questionnaire format and data was analyzed by application of descriptive and inferential statistical methods. Results: The study found that there was significant increase in nurses' knowledge regarding nocosomial infections after planned teaching programme. Conclusion: The study concluded that the nurses have appropriate knowledge toward nosocomial infection; however, it can be improved through a proper teaching programme.

Keywords: Nosocomial infections, staff nurses, planned teaching programme

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1. Introduction

A nosocomial infection also called "hospital acquired infection" can be defined as: An infection acquired in hospital by a patient who was admitted for a reason other than that infection [1]. An infection occurring in a patient in a hospital or other healthcare facility in whom the infection was not present or incubating at the time of admission. This includes infections acquired in the hospital but appearing after discharge, and also occupational infections among staff of the facility [2]. Patient care is provided in facilities which range from highly equipped clinics and technologically advanced university hospitals to front-line units with only basic facilities. Despite progress in public health and hospital care, infections continue to develop in hospitalized patients, and may also affect hospital staff. Many factors promote infection among hospitalized patients: decreased immunity among patients; the increasing variety of medical procedures and invasive techniques creating potential routes of infection; and the transmission of drug-resistant bacteria among crowded hospital populations, where poor infection control practices may facilitate transmission

Nosocomial infections affect 1 in 10 patients admitted to hospital. On average, a patient with hospital acquired infection spent 2.5-times longer in hospital, incurring additional costs as an uninfected patient. Intensive care units (ICU) have the highest prevalence of hospital-acquired infections in the hospital setting. The European Prevalence of Infection in Intensive Care Study (EPIC), involving over 4500 patients, demonstrated that the nosocomial infection prevalence rate in ICU was 20.6%. ICU patients are particularly at risk from nosocomial infections as a result of mechanical ventilation, use of

invasive procedures and their immunocompromised status [3].

Gram-positive bacteria are the commonest cause of nosocomial infections 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. Bacteria develop resistance when they acquire new genetic material. Poor antibiotic prescribing selects for resistant bacteria. The genetic material that encodes resistance is transferred to other strains. Methicillin-resistant S. aureus (MRSA) causes up to 60% of nocosomial infection in ICU. A broad-spectrum antibiotic such as vancomycin is usually prescribed for treatment. However, vancomycin-resistant enterococci and isolated cases of vancomycin-resistant *S. aureus* have been reported. This highlights the need for the use of appropriate antibiotics and some centres now discourage the use of vancomycin as first line treatment for Clostridium difficult diarrhea.

Both developed and developing countries are facing the problem of nosocomial infection. WHO (World Health Organization) reports about 8.7% hospitalized patient with nosocomial infection in 55 hospitals in 14 countries. After 6years of survey (2002-2007) of ICUs and OTs from Southeast Asia region revealed higher rates of central line associated blood stream infection, ventilator associated pneumonia (VAP) and catheter associated urinary tract infections. The study on the efficacy of nosocomial infection control project (SENIC) from 1970s showed nosocomial could be reduced by 32%. The infection surveillance were coupled with appropriate infection programmes.

The CDC released a report estimating overall directed medical costs of nosocomial infection that ranged from $28-45 billion. The blood stream were in patient with central IV lines (CVL)95% of pneumonia cases were in patient undergoing mechanical ventilation and 77% of urinary tract catheter infection.

In survey done on pediatric ICUs and neonatal ICUs, it was observed that blood stream infection accounted for 28%, pneumonia 21%, and urinary tract infection for 15%.Each of these infections who strongly associated with use of an invasive device.

According to statistics from World Health Organization (WHO), at any time, 1,400,000 people suffer from complications related to hospital acquired infections (HAI). In developing countries, the rate of preventable hospital acquired infections due to medical care is estimated to be about 40% or above [4].

Askarian et al estimated the prevalence of hospital infections in Iranian health care settings as 9.4%. Also, these authors reported that the most common type of hospital infection is related to circulatory system [5].

One of the main problems and challenges in intensive care units (ICU) are hospital acquired infections. [6] Patients admitted to ICU more than other patients are at risk for nosocomial infection due to some risk factors such as multiple trauma, low levels of awareness, and lack of preventive mechanisms [7].

The results of some studies have shown that HAI is one of the main causes of infant mortality in developing countries. [8]On the other hand, in the last century, the number of premature and twinning birth increased in developing countries due to the technological advancement in the treatment of infertility [9].

In result, preterm infants hospitalized in neonatal units are more susceptible to infection and mortality due to their immature immune systems. [10, 11]. Therefore, prevention and treatment of nosocomial infections in neonatal units is very important.

Based on recommendations from World Health Organization (WHO) and the Centers for Disease Control, hand hygiene is the most important and easy way for the control of hospital infections. Due to the critical role of nurses in patient care, there is more emphasis on the role of them in the control of hospital acquired infections. So, according to the vital role of nurses in preventing of

nosocomial infections, they are key members of infection control team in hospitals. Therefore, nurses should have sufficient knowledge and skills in the field of infection control.

Nurses are always closer to the patient more than other health team members. So, the nurse's knowledge and practice in treating the patient plays an important in prevention of the infection which is arises from health care settings and these infections are called as, "Nosocomial infection".

It was assumed that nurses have some knowledge about the nosocomial infection. Providing knowledge and skill about the nosocomial infection to the nurses to improve the practice in ICU and OT after the planned teaching programme. Planned teaching will improve the confidence of the nurses working in the ICU and OT.
Hence, the present study was planned to assess the existing knowledge of nosocomial infection among the nurses and to assess the effect of planned teaching on nosocomial infection among the staff nurses.

Study population and methods
It was pre-test post-test study which was conducted in selected regional centre in Maharashtra. The reason for selecting the hospital was owing to, the geographical proximity, economy in terms of time, adequate number of sample, administrative approval, cooperation and availability of the subjects. The population of the study consisted of 30 registered staff nurses in the selected area of hospital which were selected through convenient sampling technique.

The study was aimed at evaluating the effectiveness of planned health teaching programme regarding prevention of nosocomial infection in terms of the knowledge gained and improvement in the skill of the staff nurses. Hence, a Self-administered Structured Knowledge Questionnaire, after planned health teaching programme was used for the collection of data. Knowledge regarding prevention of nosocomial infection was assessed by a self-administered questionnaire. Planned teaching programme was given to the staff nurses and after 4days (post-test) of planned health teaching programme, knowledge about the prevention of nosocomial infection was assessed by a self-administered structured questionnaire.

Development of the tool
Structured Knowledge Questionnaire was prepared for assessing the knowledge of prevention of nosocomial infection as the following: review of research and non-research literature used in the area related to prevention of nosocomial infection; opinions and suggestions taken from experts, which helped in determining the important areas to be included.

Description of the tool
The structured knowledge questionnaire consisted of two sections i.e. sections I and sections II. Section I consisted of demographic data i.e. age, gender, professional qualification, clinical experience, and source of information on nosocomial infection. Section II comprised of 15 knowledge based items with a maximum score of 15, categorized under two broad areas, one score was given for each correct response and zero for wrong response. The maximum score was 15.
Development of planned teaching programme regarding prevention of nosocomial infection was done under following: Introduction to the nosocomial infection; Definition of nosocomial infection, Incidence, Sources of infection, Risk factors, Known nosocomial infections, Routes of transmission of infection, Clinical features, and Prevention of nosocomial infection.

Content validity
To ensure the content validity of the tool, it was submitted to 5 experts along with the blue print. One from obstetrics and gynecology department, two from medical surgical nursing, one from community health nursing departments, and two from mental health nursing dept.. The experts were selected based on their clinical expertise, experience and interest in the problem being studied. They were requested to give their opinion on the appropriateness and

relevance of items in the tool. The experts suggested comments and the modified tool contained 15 items after incorporating the suggestions.

Pilot study

A Pilot study was conducted from 16th Feb 2011 to 18th Feb 2011 to assess the feasibility of the study and present the planned health teaching, and to decide on a plan for a statistical analysis. Prior administrative permission was obtained from the Medical Superintendent Sidhivinayak Cancer Hospital, Miraj. The study was conducted on 10 staff nurses. The Sample was selected by convenient sampling technique. Data was collected through the Self-structured Questionnaire. Pre-test was given on 1st day, planned health teaching was administered, and post-test was done on the 3rd day using the same tool. After post-test the data was analyzed with the help of paired t- test. The findings indicated that planned teaching was effective for staff nurses in increasing their knowledge regarding prevention of nosocomial infection (Unpublished data).

Procedure for data collection

Formal written permission was obtained from the Medical Superintendent, regional centre in Maharashtra. Data was collected from 18th Feb 2011 to 23th Feb 2011.Data collection technique used was paper and pen test. On day one (pre-test day), the purpose of the study was explained to each staff nurse and the confidentiality of their response was assured. After pre-test, on day2 planned teaching was administered to the staff nurses. Post-test was conducted on the 4thday.

Data analysis and interpretation

Data analysis included descriptive and inferential statistics. The following analysis was made with the opinion of experts. The analysis was done based on the objectives and hypothesis to be tested. Mean median, standard deviation and mean percentage of pre and post-test knowledge scores was computed. Paired "t" test was applied to determine the significance of mean difference between mean pre-test knowledge scores and mean post-test knowledge scores.

Results

The present study identified that there was markedly change in the knowledge regarding nosocomial infection after planned teaching. Pre-test score was 7.37 which was significantly increased to 14.23 after planned teaching programme (P=0.000) (fig 1).

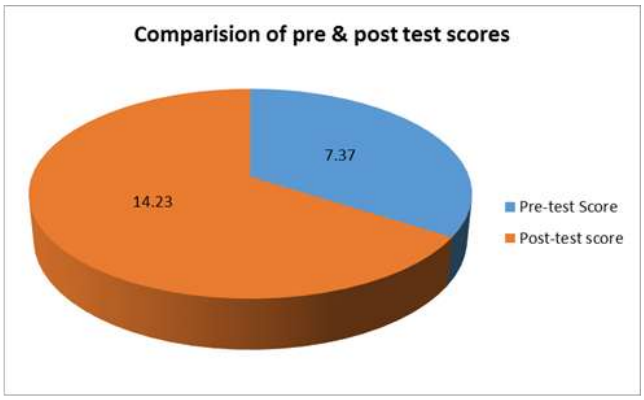

Figure 1: Pre-test and Post-test score

The present study showed that there was significant increase in knowledge of nurses regarding knowledge of nocosomial infections after planned teaching programme. Previous studies have shown role of planned teaching programme in raising knowledge of healthcare workers. [12, 13]. The teaching programme could be an inexpensive means to prevent infections.

Nosocomial infections have reached epidemic proportions and are one of the main concerns in the health care arena. A continuously increasing prevalence, 10 % of patients on general hospital units will acquire a nosocomial infection during their hospital stay. This warning alarm raises the necessity for qualifying and updating knowledge of health care providers who carry out the clinical responsibilities while providing an optimal quality of level of patient care [14, 15].

In India, 30 to 35 percent of persons admitted to hospitals develop HAIs. Among hospital-acquired infections 30to40% are urinary tract infections, 15 to 20% surgical wound infections, 15 to 20% lower respiratory tract

infections and 5 to 15% blood stream infections [16]. The incidence of HAI in Karnataka has been recorded 6.5% [17]. The nurse should be aware of the problem of nosocomial infection, their effects on patient morbidity, mortality and increased hospital costs, as well as the legal aspects concerning them. The nurse also should be knowledgeable about the types of infections seen most often, the common pathogens and how they are transmitted, factors that predispose a patient to a nosocomial infection, how to recognize persons at risk of infection, and the prevention and control measures necessary to decrease the incidence of nosocomial infections [17].

In the hospital there are many potential sources of infection, including patients, personnel, visitors, equipments, and linen. The patient may become infected with organisms from either the external environment or as is often seen in the severely immunocompromised host from their own internal organisms. Most of the causative organisms are present in the external environment of the patient and are introduced into the body through direct contact or by contact with contaminated materials. In many instances nosocomial infections could be prevented by practicing strict aseptic technique when giving care to the patents. Predominantly, it is on the hand of hospital staff as good hand hygiene could help reduce the economic burden and present distress caused by HAI, but there is evidence that it is infrequently and poorly performed by nurses [17].

Conclusion

The present study found that there was significant increase in posttest knowledge regarding prevention of nosocomial infection among the staff nurses. The planned teaching was significantly effective in increasing the knowledge of the staff nurses. The pie diagram represented significant increase in mean of pre-test score and post-test score.

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