

Effective Nursing Practices in the Prevention of Nosocomial (Hospital-Borne Infections)

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Abstract

Nurses are an important part of the any healthcare team who play a unique role in the control of Hospital acquired infections. In treatment centres and hospitals around the world, nosocomial infections are very common causing major risks and complications that even leads to the death of patients. Several preventive measures have been attempted to prevent hospital acquired infections to increase the safety and well-being of the patients.

Despite many preventive approaches implemented to reduce the microbial contamination, the infection remains to cause serious complications and increase hospital stay and treatment cost. Effective nursing practices with appropriate control measures have contributed to a substantial reduction in the incidence of hospital acquired pathogens. Nurses can effectively prevent infection from occurring with prudential measures such as "hand hygiene, skin disinfection, wearing masks and gloves to prevent the spread of infection, infusion set change, following standard caution principles, averting inadvertent contact with needle stick, preventing from the exposure to respiratory discharges". Their practices concerning hygienic environment play a crucial role to assure patients health by controlling the infections..

INTRODUCTION

Nosocomial infection is a global health problem resulting in serious complications and most importantly they are of great concern for patients as well as healthcare providers. Prevalence of this infection differ among countries. It has been reported that in a developed country, 7-10 patients out of 100 patients admitted to treatment centres were affected with hospital borne infection [1]. There is an increasing in the incidence of infection particularly surgical site and the trend continue to rise with eight percent in 2002 to thirty four percent in 2013 raising a great matter of concern. Hospital acquired infection causes potential risks to the patients that result in length of hospitalization and significantly raise the healthcare services and treatment cost. In many cases these infections reported to increase morbidity and mortality [2].

Foremost responsibilities of nurses include dressing, giving medications. It is very well known that nurses are in more contact with patients admitted in the hospitals compared to other healthcare workers and are frequently exposed to various hospital borne microbial pathogens. Since nursing professionals are more exposed to resistant microorganisms and transmit them, it is important to comply with preventive measures in controlling and transmission of nosocomial infections [3]. According to a survey conducted by a National Healthcare Safety Network, the healthcare associated infection results from an antagonistic response to a pathogen or an infectious agent. Usually, the healthcare associated infection occurs during hospital stay i.e., 48 hours or more or sometimes within 30 days after discharge [4].

Often these infection results in infirmity, paralysis, anxieties and further causes a decline in the quality of patient's well-being. It has been reported that hospital

acquired infection treatment cost ranges between \$4.5 billion to \$11 billion annually and contribute to nearly 4% of deaths [3][4]. Approximately 50% of patients who underwent surgeries return to the same hospital or a treatment centre with 23% of reported infections caused by hospital acquired pathogens. Measures to prevent nosocomial infections are highly dependent on implementing aggressive strategies, frequent modifications in medical and surgical approaches, variations in medicinal compounds, effective antibiotic treatment to inhibit drug resistant microorganisms [5].

Despite many hospital personnel are considered as key sources of spreading the infection, they also play an imperative role

in the regulation and management of hospital acquired infections. In order to control nosocomial infections, it is essential for an hospital personnel especially nurses to have an accurate, up to date scientific information on aetiology of hospital acquired pathogens, their pathogenesis, rate of infection, effects of infection and patient risk factors and adoptive measures to prevent microbial contamination [6]. Nurses are considered as the main therapeutic team in treatment centres and their increased knowledge certainly has a positive impact on their performance. Their practices concerning hygienic environment play a crucial role to assure patients health by controlling the infections. The need of the hour to control nosocomial infections is to develop policies and continuous surveys for proper hygiene and therapeutic services [7].

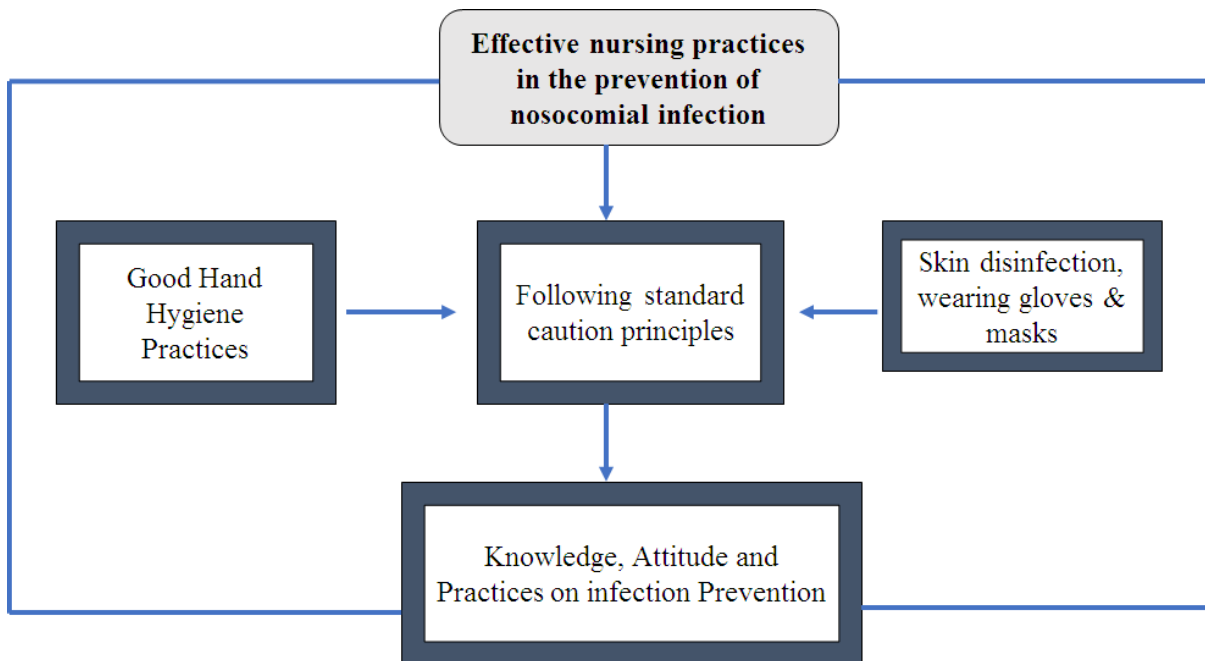
AETIOLOGY OF NOSOCOMIAL INFECTIONS

There is a growing concern worldwide due to the increase in the incidence of multi-resistant bacteria. Commonly acquiring nosocomial infections are acquired through RT and

intravascular devices. Mode of infection and pathogenesis vary depending on the type of microorganism and their antibiotic resistance. Gram positive Staphylococcus aureus, Gram negative Bacilli, Gram negative Enterococcus accounts approximately twenty percentage of nosocomial infections [8].

RISK FACTORS FOR NOSOCOMIAL INFECTION

Nosocomial infections are very common in new-borns, children, aged population and in immuno-compromised patients. Factors that contribute to the infection includes mechanical ventilation, indwelling catheters, prolonged use of antibiotics resulting in antibiotic resistance and continuous uptake of histamine receptor blockers due to overgrowth of potent microorganisms [9].



Previous studies confirming the role of nurses in the prevention of nosocomial infections

Despite developments in the health care system, nosocomial infections still remain the problem of great concern. Hospital acquired infections contribute to nearly eighty thousand deaths in U.S. alone [10]. Mode of transfer of the infection is from one patient to another through health care and nursing professionals who have not sanitised their hands properly with inadequate preventive control practices. Effective nursing practices with appropriate control measures have contributed to a substantial reduction in the incidence of hospital acquired pathogens. Many authors have concluded that taking part in medical and healthcare education programmes had a positive impact on the nosocomial infection prevention procedures [11].

Nurses can effectively prevent infection from occurring with prudential measures such as “hand hygiene, skin disinfection, wearing masks and gloves to prevent the spread of infection, infusion set change, following standard caution principles, averting inadvertent contact with needle stick, preventing from the exposure to respiratory discharges” [12]. Although, many research states that hospital personnel have adequate knowledge to prevent the spread of hospital acquired infections, many studies have also reported that nursing practices on infection control is sometimes inconsistent. McBride and his team conducted a study in

America of effective nursing practices to prevent infectious microbial contamination and the outcomes of the analysis reports that almost 65% had inadequate knowledge to prevent these infections [13]. Other studies by Angelillo et al. and Bota et al. also revealed that many of nursing professionals had no appropriate knowledge in controlling the infection. This issue highlights the need for consideration in improving appropriate knowledge in resisting the occurrence of microorganisms. Prevention and control measures to hospital acquired infections depends on individual’s education and attending infection control programs in offering complete hygiene [14][15]. Gould and his team results revealed that continuous medical education on the prevention of nosocomial infections is highly effective in delivering effective nursing practices in hospital acquired infections [16].

RaeisKarimian and his team conducted a study on the performance of nurses in the management of nosocomial infections and the results showed that almost 75.8% of nurses involved in the study had adequate knowledge and proper performances. However, there was no significance relationship observed based on performance and their level of knowledge [17]. Effective approaches to control these infections involve hand hygiene following treatment procedures. Nurses play an imperative role in reducing potential risks of hospital borne infections by following

simple yet effective measures such as frequent hand washing. It is essential to offer support (suitable equipment, continuous medical education) systems that facilitate in delivering excellent performance. World Health Organization has recommended continuous observations and routine monitoring on performances of nurses concerning the nosocomial infections. Many studies have reported that with adequate knowledge nursing practices can be improved with respect to hospital acquired infection. Results of several studies highlighted the importance to implement national database system to evaluate nursing practices and interventions [18][19].

A study conducted by Alrubaiee et al. on the control measures to prevent infection transmission in hospital environment shows that 52.9% of nurses had excellent knowledge on cleaning procedures and 81% had adequate level of information on routine waste handling and disposal. This study also revealed that 83% of them had a good level of knowledge equipment reprocessing related to patient care only very few percentages of nurses had a fair level of knowledge on linen handling procedures. Outcomes related to nosocomial infection control measures revealed that 87% had excellent and 4% had good level of knowledge respectively. Only 9% of participants reported with poor performance on nosocomial infection preventive measures [20].

According to Ginny et al. hospital acquired infections result in morbidity, mortality across the world and increases the length of stay and cost of treatment. To overcome these complications, it is vital for nurses to have good level of knowledge and excellent practices to control and prevent the occurrence of nosocomial infections. The results of their study showed that almost 73% of nurses had a good level of practice on hand hygiene and 35% had an excellent level of personal protective equipment handling and practices. Overall, 87% of nursing professionals perform excellently in control and prevention of different hospital acquired pathogens. The results also highlighted that those who attended continuous medical education and training courses accomplished high knowledge scores [21].

A survey with support from World Health Organization was conducted in fifty-five hospitals representing fourteen

Gloves are highly beneficial in preventing microbial contamination and transmission of nosocomial pathogen. Foremost consideration while using a single use glove is that it should be changed after attending each patient. Secondly, it should never be resterilised, sanitized and washed after every single use. For procedures such as insertion of urinary catheters or central venous catheters, sterile gloves are preferred than clean gloves. For other indwelling procedures such as wound dressings, clean gloves can be used [26].

Intravenous catheters

Intravenous lines contribute to one fourth of all hospital acquired blood stream infections. In critically ill patients,

these nosocomial infections result in serious complications with a reported mortality rate at 25%. The organisms responsible for causing blood stream infections include gram positive cocci particularly 2/3rd of the infection is caused by Staphylococcus species with 15% reported cases of Staphylococcus infection. In many cases there is lack of body's natural defence mechanism due to the insertion of intravenous needles/cannula and microbial pathogens enter the circulation as a result of any contamination and started to grow on the surface of cannula [27].

Preventive Measures

Preventive measures to overcome these complications include vigilant insertion and ideal catheter practices. In surgical procedures, insertion of peripheral catheter requires careful and best precautionary measures and practices. Before inserting cannula, the insertion site must be carefully disinfected for a minimum of 30 seconds and permitted to dry and the site of insertion are allowed to touch after disinfection procedure. It has been reported that nursing professionals who followed strict disinfectant practices resulted in a manifold reduction in catheter associated bacterial infections. The need of the hour in healthcare practices is to prevent nosocomial infections that often result in increase in hospital stay and known to result in significant morbidity and mortality. Promotion of aseptic techniques and good sanitary practices through continuous healthcare education programmes have largely contributed to the success in the reduction of hospital acquired pathogens. In many developing countries' efforts are being made to ensure the implementation of nosocomial infection control measures into practice through vigilant nursing practices[28].

CONCLUSION

Hospital acquired infection causes potential risks to the patients that result in length of hospitalization and significantly raise the healthcare services and treatment cost. In many cases these infections reported to increase morbidity and mortality. Nurses can effectively prevent infection from occurring with prudential measures such as "hand hygiene, skin disinfection, wearing masks and gloves to prevent the spread of infection, infusion set change, following standard caution principles, averting inadvertent contact with needle stick, preventing from the exposure to respiratory discharges". Effective nursing practices with appropriate control measures have contributed to a substantial reduction in the incidence of hospital acquired pathogens.

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