KNOWLEDGE, PRACTICE AND TECHNIQUE ON HAND HYGIENE AMONG NURSES WHILE CARING FOR PATIENTS.

BY

Malarvizhi .A

A DISSERTATION SUBMITTED TO THE TAMILNADU DR.M.G.R.MEDICAL UNIVERSITY, CHENNAI, IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR DEGREE OF MASTER OF SCIENCE IN NURSING

MARCH 2011

KNOWLEDGE, PRACTICE AND TECHNIQUE ON HAND HYGIENE

AMONG NURSES WHILE CARING FOR PATIENTS

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DECLARATION

I hereby declare that the present dissertation entitled "**KNOWLEDGE, PRACTICE AND TECHNIQUE ON HAND HYGIENE AMONG NURSES WHILE CARING FOR PATIENTS."** is the outcome of the original research work carried out by me under the guidance of Prof. S.Ani Grace Kalaimathi M.Sc(N)., PGDNA., DQA., Ph.D, Research Guide and .Prof.N.Jayasri M.Sc(N)., M.phil(N)., Ph.D,HOD, Department of Medical Surgical Nursing, MIOT College of Nursing, Chennai. I also declare that the material of this has not been formed in any way, the basis for the reward of any degree or diploma in this university or other universities.

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II Year M.Sc (N)

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"Man needs challenges and difficulties as they need to enjoy the real success."

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ABSTRACT

A study was conducted to assess the knowledge, practice and technique on hand hygiene among the nurses while caring for patients in selected areas of a selected hospital. The conceptual frame work was developed on the basis of Becker and Miman's health belief model.

In this study, quantitative research approach and descriptive research design were used to achieve the objectives of the study. The study subjects were nurses from Medical Intensive care unit, Coronary care unit, Trauma Intensive care unit and Post operative ward. The nurses were selected through convenience sampling technique. Pilot study was done and all the strengths and weaknesses were analyzed. Data collection was done for 6 weeks. Assessment of practice and technique on hand hygiene among nurses was done by concealed participatory observation method and questionnaire was provided on the last two days of data collection in each of the four settings to assess the knowledge on hand hygiene among the nurses. The collected data were tabulated and analyzed using descriptive and inferential statistics.

The demographic revealed that majority of the participants were females (93.9%), below 25 years (84.8 %), B.sc nurses (57.6%).45.5% of the nurses were having total work experience of 7-12 months and48.5% of them were having 7-12 months work experience in the current area.. Only 63.3 % of the nurses had previous source of information on hand hygiene and among this group 48.5%of the nurses got the information only from textbooks. It was noted that only 39.4% of the nurses had adequate knowledge on hand hygiene. It was also noted that 21 nurses (63.6%) were having the average (51%-64%) score on hand hygiene technique, whereas one nurse (3%) was having the excellent (> 80%) and good score (65 – 75%) on hand hygiene

technique. It was also revealed that the practice on hand hygiene before and after procedure was poor (<50 %) for all the nurses. None of the participants were having good & excellent hand hygiene practice before and after procedures.

The study findings revealed that the age of the nurses had significant association with knowledge on hand hygiene at the level of $P<0.05$. The age, present experience of the nurses had significant association with technique on hand hygiene at the level of $P<0.01$.It was also revealed that the age of the nurses had significant association with practice before and after procedure on hand hygiene of nurses at the level of $P<0.001$. No other demographic variables had significant association with knowledge, practice and technique on hand hygiene. It also found that there was a negative correlation between knowledge with practice and technique. It was also revealed that there was a positive correlation between practice and technique. There was no significant relationship between knowledge, practice and technique. This could be interpreted that even though the nurses had adequate knowledge, continuous monitoring was needed to enhance adherence to practice and technique on hand hygiene. It was also revealed that through the results, the researcher found that an in-service education should be conducted periodically to update knowledge on hand hygiene and to improve the practices and techniques among the nurses. The researcher conducted in -service education on hand hygiene among the nurses in all of the four setting

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CHAPTER I

INTRODUCTION

"Hospitals are intended to heal the sick, but they are also the sources of infection".

Though we have an advanced medical facility that increase the life span of human beings, yet we face the problem of hospital acquired infections. Health care-associated infections occur worldwide and affect both developed and resource-poor countries. Infections acquired in health-care settings are among the major causes of death and increased morbidity in hospitalized patients. They represent a significant burden for both the patient and his or her family and for public health. A prevalence survey conducted under the auspices of WHO in 55 hospitals of 14 countries revealed that on an average, 8.7% of hospital patients affected from nosocomial infections. At any time, over 1.4 million people world widely suffered from infectious complications associated with health care and 80,000 deaths annually. In England, health care-associated infection caused 5,000 deaths each year among the critically ill, even in highly resourced units, at least 25% of patients who admitted would be affected with a health care-associated infection. In some countries, this proportion might be much higher. For example, in Trinidad and Tobago as many as two-thirds of patients who admitted in intensive care units affected with at least one health care-associated infection. Tribune news service, Chandigarh (2006) reported that in some states of India, there is mandatory reporting for individual hospitals regarding hospital acquired infections. In India, nosocomial infection rate is over 25 per cent and it was responsible for more mortality than any other forms of accidental death.

About 5-10% of hospital acquired infections (HAI) are in most developed nations; in India, one in four patients admitted into hospital suffer hospital acquired infections.

The Center for Disease Control and Prevention (CDC) said that ‘’Hand washing is the single most effective way to prevent the transmission of disease.” Among all steps of infection control or infection prevention “hand washing” is the cheapest, easiest and most desirable method. Unfortunately, infection control in the majority of our hospitals is completely neglected and hand hygiene had never been given priority. The hands of nurses who provide health care to patients palpate, percuss, and perform procedures, comfort parents and hold children, among many other activities. These procedures provide ideal chances for microorganisms to travel between the nurse and the patient.

“Hands that heal are hands that harm”

Nurses use their hands to perform countless deeds that heal and comfort. They connect catheters for the critically ill. Their reassuring grip calms tense mothers in childbirth. And their steadfast clasp brings silent dignity to patients experiencing peaceful death. Nurses use their hands constantly to dispense expert care. Ironically, when they rush to meet patients’ needs, nurses may unwittingly be dispensing something else to patients via their hands; disease-causing germs. Nurses routinely check patient identification wristbands before administering medication; they know that dispensing the wrong drug to patients could be disastrous. Like this, they should give importance to hand hygiene also. If proper hand hygiene becomes as habitual activity among nurses as patient identification checks hospital infections might decline and nurses would have incorporated another significant measure of personal

safety into their profession. Hence the hands of the nurse that heal would no longer dispense unintended harm.

Need for study

"Clean hands save lives"

With advances in the health care system, the threats to hospital acquired infections (HAI) are still remain**.** Hospital acquired infections are known to result in substantial morbidity and are estimated to cause or contribute to nearly 80,000 deaths annually in the United States. Many nosocomial infections are caused by pathogens transmitted from one patient to another by the way of health care team members who did not wash their hands between patients. Although Semmelweis demonstrated that hand washing itself was sufficient in reducing the incidence of nosocomial infections, compliance of health care team members with the recommended hand washing practice remains low. Poor compliance is associated with lack of awareness among personnel.

Medical hand hygiene pertains to the hygiene practices relating to the administration of medicine and medical care that prevents or minimizes the spreading of disease. The main medical purpose of washing hands is to clean the hands off pathogens (including bacteria or viruses) and chemicals which can cause personal harm or disease. To reduce the spread of germs, it is better to wash the hands and/or use a hand antiseptic before and after treating a sick person. If your hands are not visibly dirty or soiled, washing one's hands with a good hand antiseptic like alcohol hand rub is the most effective way to prevent the spread of infectious disease. If your hands are dirty or soiled, washing your hands with soap and water is the most

effective overall way to prevent the spread of infectious disease. Hand hygiene reduced the incidence of health care associated infection (66.67 %). In 1960, a prospective controlled trials sponsored by the National Institute of Health and Office of the surgeon general demonstrated that infants cared by nurses who did not follow hand hygiene practice acquired staphylococcus aureus infections more often and more rapidly than infants cared by nurses who followed hand hygiene. The care of critically ill patients in the intensive care unit (ICU) is a primary component of modern medicine. ICUs created potential for recovery in patients who otherwise may not have survived. However, they may suffer from problems associated with nosocomial infections. Urinary tract infections are the most frequent nosocomial infection, accounting for more than 40% of all nosocomial infections. Critical care units increasingly use high technology medicine for patient care such as hemodynamic monitoring, ventilator support, haemo dialysis, parenteral nutrition, and a large battery of powerful drugs, particularly antibiotics to counter infection. Inspite of using modern medicines the hospital acquired infections would occurr more in intensive care settings.

Nurses put themselves as well as their patients at risk when they don't follow hand hygiene said, Georia Dash, RN,MS,CIC president of Association of Professionals in Infections control and Epidemiology .The purpose of the study is to understand the level of knowledge, practice and technique among the nurses in various intensive care settings on hand hygiene. Despite advances in infection control and hospital epidemiology, nurses' adherence to recommended hand hygiene practice is unacceptably low. From the investigator's own experience in the hospital setting found that patients admitted in hospital for longer duration had MRSA infections

because of poor adherence to hand hygiene .So the investigator would like to know the nurses' knowledge and adherence to hand hygiene practices and techniques.

Statement of the problem

A study to assess the knowledge, practice and technique on hand hygiene among the nurses while caring for patients in selected areas of a selected hospital.

Objectives

- To assess the knowledge on hand hygiene among the nurses while caring for patients.
- To assess the practice & technique on hand hygiene among the nurses while caring for patients.
- To correlate knowledge, practice and technique on hand hygiene among the nurses while caring for patients.
- To associate the knowledge, practice and technique on hand hygiene among the nurses with selected demographic variables.

Operational Definition

Knowledge

In this study, knowledge refers to the state or fact of knowing about hand hygiene by the nurses.

Practice

In this study, practice refers to the act of carrying out hand hygiene before and after doing the procedure while taking care of patients.

Technique

In this study, technique refers to the practical method or art applied to hand hygiene-7steps of hand washing or using alcohol hand rub before and after doing the procedures.

Hand hygiene

In this study, hand hygiene refers to the act of cleansing of hands with the cleaning agent such as soap & water or using alcohol hand rub.

Nurses

In this study, nurses refer to the persons educated and trained to care for the sick or disabled at selected hospital.

Patients

In this study, Patients refer to the persons who require medical care.

Selected Areas

In this study, selected areas are Trauma intensive care unit **(**TICU**),** Medical intensive care unit (MICU**),** and Coronary care unit (CCU), Post operative ward (POW). Here after, these are referred to as TICU, MICU, CCU and POW in this study.

Assumptions

- Hand hygiene is imperative in hospital setting.
- Nurses may have adequate knowledge on hand hygiene.
- Nurses are not following adequate hand hygiene practice & technique for safety of themselves & patients.

Delimitation

- The study is limited to staff nurses in selected areas (TICU, Post operative ward, MICU, CCU) of a selected hospital.

- The duration of the study is limited to 6 weeks.

Projected Outcome

The results of the study will help the researchers and hospital administrators to know the level of knowledge, practice and technique on hand hygiene among the nurses.

Through the results of the study, the investigator would be able to conduct an in-service education on hand hygiene and also recommend the hospital to prepare pamphlets, protocols and posters on hand hygiene to display in the wards.

CHAPTER II

REVIEW OF LITERATURE

Introduction

A literature review involves the systematic identification, location, scrutiny, and summary and written materials that contain information on a research problem. (Polit&Beck, 2004)

This chapter deals with a review of published and unpublished research studies and from related materials for the present study.

This review of literature in this chapter is presented under following headings.

Section A-Literature related to hospital acquired infections

Section B–Literature related to hand hygiene

Section C-Literature related to nurses' knowledge on hand hygiene

Section D-Literature related to nurses' adherence to hand washing practice and technique

Section E-Literature related to importance of education on hand hygiene

Section A - Literature related to hospital acquired infections

Karthikeyan kumaraswamy (2010) researcher at the University of Madras stated that the hospitals in India don't have registers regarding mortality and morbidity due to hospital acquired infections.

Mathew Wainstock (2009) pointed out that 90% of the nosocomial infections can be prevented by proper hand washing.

Umesh S Kamat et al. (2009) conducted a prospective observational study on hospital acquired infections among 498 in-patients at the Medical College hospital in Goa. The findings showed that overall infection rate was eight per 100 admissions and 33.6% of the catherized patients developed hospital acquired urinary tract infections.

New York Times (2008) reported that in a given year, 1.7 million patients got hospital acquired infections during the hospital stay. Out of those, 99,000 patients annually or about 170 per day died.

Shabins Habib et al. (2008) conducted a prospective observational study on 182 patients to assess the rate of nosocomial infections in the department of pediatrics at All India institute of medical sciences in New Delhi. The findings of the study showed that 77% of the patients got pneumonia, 24% got urinary tract infections followed by 24% got bloodstream infections.

The Pennsylvania hospital cost containment council (2007) reported that the average hospital charge without a hospital acquired infection is nearly six times less than for patients who experienced hospital acquired infection.

CDC (2002) reported that over 2 million patients experienced hospital acquired infection per year and 88,000 of those people died as a result of direct or indirect cause of infections.

Piett et al. (2000) presented data from the University of Geneva Hospital stated that the total cost of hand hygiene promotion corresponded to less than 1% of the costs associated with nosocomial infections.

Williams Jarvis (2000) stated that at least 5% of the patients who are receiving care in the acute care hospitals get hospital acquired infections.

Section-B Literature related to hand hygiene

Carol Taylor (2008) stated that WHO guidelines recommended of removing all the jewellery (except wedding rings) in which bacteria tends to accumulate.

Meers et al. (2008) conducted the laboratory study of shedding of skin squames and viable bacteria from hands before and after washing with bar soap, surgical scrubs containing either Chlorhexidine Gluconate, hexachlorophene or povidone-iodine, or an alcohol hand rinse among 16 nurses in Medical intensive care setting at UK hospitals. Bacterial shedding is greatest with bar soap, and least with Chlorhexidine Gluconate detergent and alcohol rinse.

APIC(2005) stated that nail polish did not appear to increase the number of micro organisms as long as the polish is not chipped.

CDC (2005) reported that hand hygiene using only with soap and water prevented the patients from clostridium difficile associated diseases; alcohol based hand rubs was not effective against spores forming bacteria.

Doebbeling et al. (2005) stated that the bacteria were able to penetrate gloves and contaminate hands of volunteers. So he emphasized the need of cleaning hands after glove removal.

In 2005, the Geneva hospital launched a highly visible program including promoting the use of alcohol hand sensitizer. He found that hand hygiene compliance had risen from 17%to 60% after four months.

Arthur et al. (2004) conducted a study at Walter reed army medical center, Washington to assess the effectiveness of two methods of pre surgical hand

preparation, the 10 minute routine scrub and the 90 second Hydro scrub, in reducing microbial numbers under the fingernails was determined. Bacteriological cultures of 162 subungual areas of nine subjects revealed that pre scrub microbial counts were up to 1.9 X 105 colony-forming units per area. After the surgical scrub, bacterial concentrations were reduced to a different degree among the persons tested. The study results showed that scrubbing hands removed subungual bacteria more effectively when fingernails were short.

CDC (2002) collaborated with the society for health care epidemiology and the infectious Disease society of America, released updated guidelines for hand hygiene in health care settings. They also included the routine use of alcohol hand sensitizers in clinical settings.

Pottinger et al. (2002) undertook a culture survey of flora on fingertips of 56 nurses with artificial nails and 56 with natural nails before and after hand washing at veterans administration medical center, Sioux. The results found that a greater number of gram-negative rods were recovered from the fingertips of nurses with artificial nails both before and after hand washing.

Korniewicz et al. (2001) Johns Hopkins University, Baltimore stated that Serratia marcescens was able to penetrate vinyl gloves more frequently than latex gloves under conditions simulating clinical use. He emphasized the importance of cleaning the hands after removal of gloves.

McNeil et al. (2001) stated that switch from soap and water hand washing to an alcohol-based hand rub in a Russian neonatal intensive care unit resulted in a slight increase in hand hygiene compliance and a decrease in transmission of Klebsiella.

Berndt et al. (2000) conducted a prospective, randomized clinical trial of comparing the impact of soap and water hand washing with an alcohol hand gel on skin condition of nurses' hands among 25 nurses at Friedrich-Schiller-University, Jena, Germany. Objective measurements and visual assessments of nurses' hands documented that nurses experienced significantly less skin dryness when using the alcohol hand gel.

Piett et al. (2000) stated that hand sanitizers containing a minimum of 60 to 95% alcohol were efficient germ killers. Alcohol rub sanitizers killed bacteria, multi-drug resistant bacteria (MRSA and VRE), tuberculosis, and viruses (including HIV, herpes, RSV, rhinovirus, influenza, and hepatitis) and fungus. Alcohol rub sanitizers containing 70% alcohol killed 99.9% of the bacteria on hands 30 seconds after application and 99.99 to 99.999% of the bacteria on hands 1 minute after applications.

Rotter et al. (2000) conducted a prospective, randomized; double blind study among 20 nurses at Hygiene-Institute, University Vienna, Austria to assess the acceptability of alcohol hand rinse with and without emollients. The results revealed that skin condition of hands was significantly better when nurses used the alcohol rinse containing emollients.

Section C Literature related to nurses' knowledge on hand hygiene

Tai et al. (2009) conducted a multi center exploratory study among 129 healthcare personnel at 4 acute care hospitals in Honkong. The results revealed that the knowledge score was 59.3% and practice was also less than50% on hand hygiene. It was also revealed that hand hygiene practice before procedure was very low (30%) than after procedure.

Akyol et al. (2007) conducted a descriptive study among 129 clinical nurses at University of Ege faculty of medicine .The findings showed that the nurses had poor (<50%) knowledge on hand hygiene.

Kennedy et al.(2004) conducted a descriptive study in NICU to assess the knowledge and practice among the three categories of nursing personnel .The findings revealed that only 31.2% of the nurses had excellent knowledge(>89%)and there was a significant differences among the groups on hand hygiene practice.($p<.001$).

Beghadadli et al. (2003) conducted a survey in a Western Algerian hospital to assess the knowledge & practice on hand hygiene. The results revealed that the majority of the nurses (95%) washed their hands after removing the gloves and 69% of them washed their hands between two patients. It also found that the knowledge level of the nurses on hand hygiene was poor

Section D -literature related to nurses' adherence to hand hygiene practice and technique

DiaNM et al. (2008) conducted a descriptive study on 256 health care personnel at Fann hospital to assess the nurses' adherence to hand hygiene technique. They found that 59% of the health care personnel were not adhering to hand hygiene technique completely followed by 34% of them were not used dry towels.

Chandra PN (2007) conducted an observational study in neonatal unit at Mahathma Gandhi Institute of medical sciences, New Delhi to assess the lapses in measures recommended for preventing HAI. These results showed that lapses in hand washing were observed with 41% of the time where as lapses in method of drying hands was seen around 7-8%of the time.

McArdle et al. (2006) conducted a 10-month study involving 124 hours of observation in an intensive care unit among the nurses at Edinburgh Royal Infirmary, Edinburgh, UK. The results inferred that each patient was contacted an average of 159 times/day and contacts with the immediate environment occurred 190 times/day, which would require 230 minutes/patient/day for hand hygiene if compliance were 100%. The authors noted that time requirements for hand hygiene are not frequently considered when determining staffing levels for intensive care units.

Voss et al. (2004) documented that it took an average of 62 seconds for intensive care nurses to walk to a sink, wash hands, and return to patient care in the intensive care settings. The duration of hand washing was required four times more than using an alcohol hand rub available at patient bedsides. So it was concluded that using alcohol hand rub saves the time.

Olsen et al. (2003) conducted a study to assess the need for hand hygiene after removing gloves among health care workers at Harborview Medical Center, Seattle. It revealed that healthcare workers contaminated their hands with patient skin flora despite wearing gloves during patient contact, presumably via tiny holes in gloves or by contaminating their hands when removing the gloves.

Vernon et al. (2003) conducted an observational study to assess the adherence to hand hygiene in 14 intensive units at Cook county hospital, Chicago with varying sink-to-bed ratios (range, 1:1 to 1:6). They found that adherence was less than 50% in all units and there was no significant trend towards improved hand hygiene with increased sink-to-bed ratios.

Lankford et al. (2003) conducted a comparative study to assess the adherence of healthcare workers to recommend hand hygiene procedures between an old

hospital and a new hospital with improved facilities at Northwestern Prevention Epicenter, Chicago. Surprisingly, adherence was lower in the new hospital. Adherence was lower when a high-ranking healthcare worker in the hospital did not wash their hands, suggesting that role models may influence hand hygiene habits among healthcare workers

Lucet et al. (2002) undertook a study to compare the use of hand washing with an antimicrobial soap and hand disinfection with an alcohol-based hand rinse among 43 healthcare workers at Bichat-Claude Bernard hospital, Paris, France. The results revealed that the reduction of bacterial counts on the hands of personnel significantly with alcohol hand rub was better than washing hands with plain soap.

Quashmaq IA (2000) conducted a prospective observational study to assess the adherence to hand hygiene among 115 health care personnel at King Faisal specialist hospital & research center, Jeddah, Saudi Arabia. The findings revealed that all the health care personnel adhered to hand hygiene before putting on gloves and 57.4% of them were not adhered fully to hand hygiene technique whereas 42.6% did not attend to hand hygiene at all.

Section E Literature related to importance of education on hand hygiene among the nurses.

Dr.Anitha Sharma (2010) conducted a study to assess the impact of multi method approaches to improve the adherence to hand hygiene practice among nurses at Fortis hospital Mohali, India. The study results revealed that hand hygiene compliance was improved from 30% to 62% after providing all the adequate supplies, displaying hand hygiene posters ,conducting induction programs and performing competency assessment.

Horne Briter et al. (2010) conducted a quasi experimental study to assess the practice on hand hygiene among the nurses. The findings showed that the adherence to hand hygiene among nurses was significantly improved ($p<0.01$) five months after conducting education paired with positive behavior interventions.

Susan C Lathan (2008) conducted a study to assess the impact of monitoring of hand hygiene among nurses in intensive care setting .The results found that 38% hospital acquired infections were reduced after 2 years.

Williams Picheansathan (2008) conducted the quasi experimental study to identify the impact of promotion program on hand hygiene practice and its effect on nosocomial infections rate among the 26 nurses in NICU of University hospital, Thailand. After 7 months of implementing hand hygiene promotion program, compliance with hand hygiene among the nurses was improved.

JB Suchitra, N Lakshmi Devi (2007) conducted a study among 150 HCWs, doctors (n=50), nurses (n=50) and nursing aides (n=50), on nosocomial infections at Mysore University, Mysore. Subjects in each category of staff (n=10) were observed for compliance to hand washing practices in the ward after giving an education. The study showed an increase in the number of subjects in each category scoring good and excellent in the post-education questionnaire. Total compliance was 63.3% (95% CI= 58.80-88.48).The study stressed that an education has a positive impact on retention of knowledge, attitudes and practices in all the categories of staff. In order to reduce the incidence of nosocomial infections, compliance with interventions are mandatory.

Bischoff et al. (2005) conducted a pre experimental study to assess the effectiveness of education on hand hygiene practice among 150 nurses in medical ICU, cardiac surgery ICU at 728-bedded, tertiary care, teaching hospital, Richmond.

The results showed that the hand hygiene compliance was 9% (before),22%(after) in medical ICU and 3%(before),13%(after)in the surgical ICU respectively. After education hand hygiene compliance was increased to 4% (before),25%(after) in medical ICU and 6%(before),13%(after) in cardiac surgery ICU. After introduction of alcohol hand rub, hand hygiene compliance was increased to 19% (before) & 41% (after) with 1 dispenser per 4 beds and 23% (before), 48% (after) with 1 dispenser per each bed.

Victor Daniel Rosenthol et al. (2001) conducted the pre experimental study to assess the effect of education and performance feedback on hand hygiene among the health care personnel in intensive care units of 3 hospitals at Argentina. The study results revealed that the baseline rate of hand hygiene before contact with patients increased from17% to 44% ($p<0.001$) with education and the rate is further increased to58% with education and performance feedback.

Muto et al. (2000) stated that a brief educational program and making an alcohol hand rub available in wards did not necessarily lead to sustained improvement in hand hygiene compliance among the health care personnel. Implementing long term multidisciplinary program should be conducted to promote hand hygiene practice and technique.

A crossover intervention trial was conducted by Larson et al. (2005) in two pediatric units at New York-Presbyterian hospital, New York. They used observations and counting devices installed in manual and in touch-free alcohol hand sanitizer dispensers to compare the frequency of hand hygiene episodes and the level of compliance among the personnel. Although the overall compliance rate was low (38.4%), the mean number of hand hygiene episodes/hr and the mean numbers of

hand hygiene episodes per indication were significantly greater when touch-free dispensers were in use. The authors suggested that electronic counters or unit-specific sanitizer volume measurements may have a value as methods for monitoring hand hygiene compliance.

CONCEPTUAL FRAME WORK

Introduction

The theoretical framework for research study presents that the reasoning on which the purposes of the proposed study are based.

Theoretical framework consists of concepts and proposition about how these concepts are related. The frame serves three important functions in nursing research.

- It clarifies the concepts on which the study is built.
- It identifies and states the assumptions, hypotheses underlying study.
- It specifies relationship among the concepts.

The framework provides the prospective from which the investigator views the problem and is not merely "restatement of previous research but an integration of the existing theoretical traditions and knowledge about the topic".

Becker and Miman's health belief model

The framework for this study was based on Becker Miman's health belief model. The health belief model was proposed by Becker & Miman (1975) who addressed relationship between person's belief and behaviors. It provides a way of

understanding and predicting how the clients will behave in relation to their health and how they will comply with health care therapies. This study focuses on accessing nurses' knowledge on hand hygiene and to identify whether they are adhering to hand hygiene practice & technique or not. It also predicts the relationship between knowledge, practice & technique.

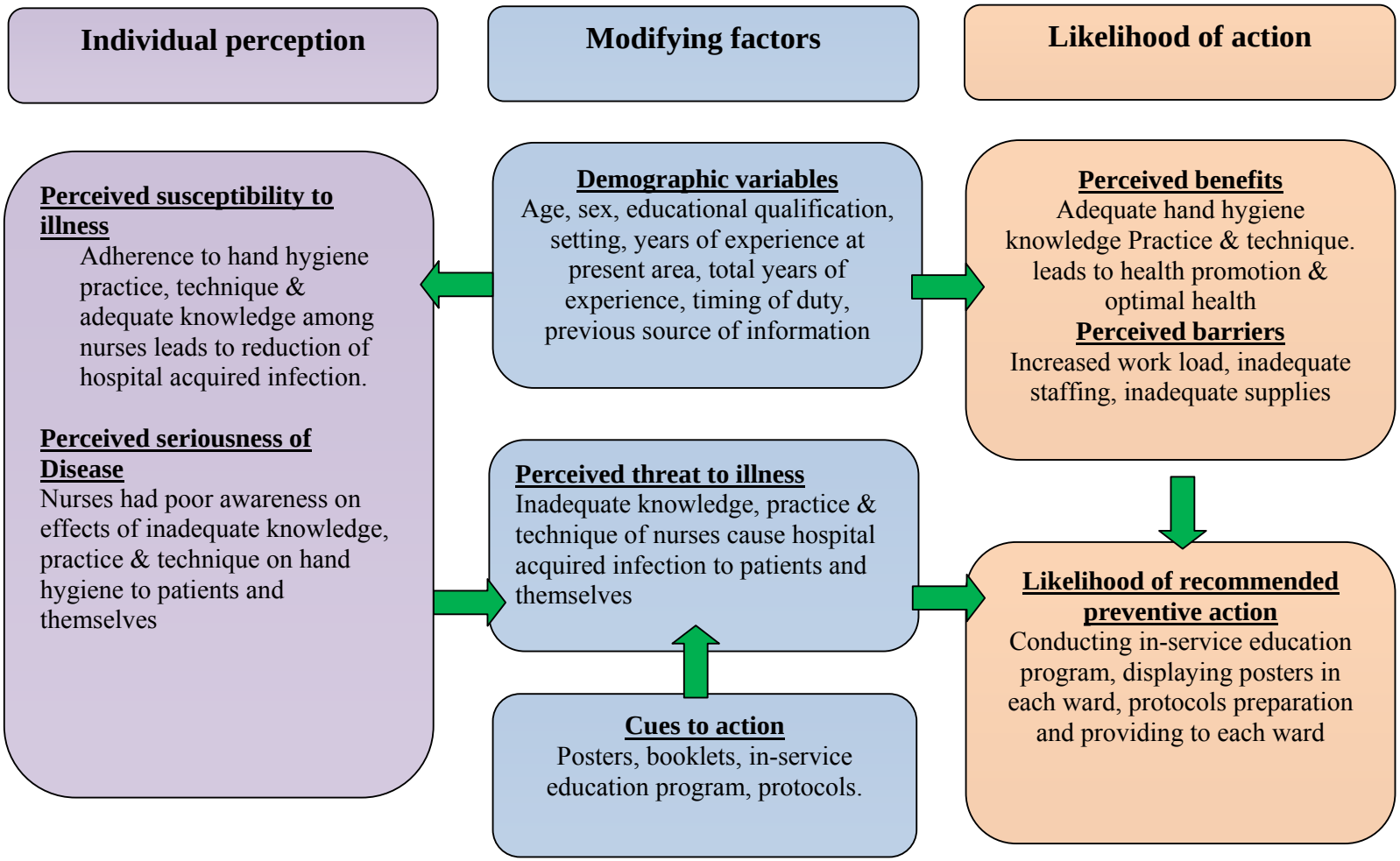
The first component of this model involves the nurses' perception of susceptibility to hospital acquired infection.

The second component is the nurses' perception of the seriousness of the inadequate knowledge, practice & technique on hand hygiene.

This perception is influenced and modified by demographic variables like age, present &total years of experience, timing of duty, setting, previous sources of information, and perceived threats of hospital acquired infection to patient and themselves. Cues to action were from posters, booklets, in service education program and protocols.

The third component is the likelihood of recommended action that a nurse will take preventive action resulted from the nurses' perception of the benefits of adequate hand hygiene knowledge, practice & technique. It enhances the health promotion & optimal health. Barriers for these were increased work load, inadequate staffing, and inadequate supplies to take action. Preventive action may include conducting inservice education program, displaying posters in each ward.

The health belief model helps the nurses to understand the factors influencing inadequate knowledge, practice & technique on hand hygiene in order to plan care that will most effectively assist clients in maintaining or restoring health and preventing nosocomial infections.


Individual perception
Modifying factors
Likelihood of action
Perceived susceptibility to illness
Adherence to hand hygiene practice, technique & adequate knowledge among nurses leads to reduction of hospital acquired infection.
Perceived seriousness of Disease
Nurses had poor awareness on effects of inadequate knowledge, practice & technique on hand hygiene to patients and themselves
Demographic variables
Age, sex, educational qualification, setting, years of experience at present area, total years of experience, timing of duty, previous source of information
Perceived threat to illness
Inadequate knowledge, practice & technique of nurses cause hospital acquired infection to patients and themselves
Cues to action
Posters, booklets, in-service education program, protocols.
Perceived benefits
Adequate hand hygiene knowledge Practice & technique. leads to health promotion & optimal health
Perceived barriers
Increased work load, inadequate staffing, inadequate supplies
Likelihood of recommended preventive action
Conducting in-service education program, displaying posters in each ward, protocols preparation and providing to each ward

Conceptual frame work based on Becker and Miman's health Belief model (1975).

CHAPTER III

METHODOLOGY

This chapter deals with Research methodology adopted by the researcher to assess the knowledge, practice and technique on hand hygiene among the nurses.

Research approach

As this study attempted to assess the knowledge, practice and technique on hand hygiene, the quantitative research approach was found to be appropriate.

Research design

The research design used for this study was descriptive research design.

Setting of the Study

The present study was conducted at a selected hospital with the bed strength of 450 equipped with qualified health care personnel and recent technologies. It was done in following four settings :TICU, Post operative ward, MICU and CCU.

Population

The population in this study comprised of all the staff nurses who were working at a selected hospital.

Sample

Samples consisted of the staff nurses who were working in selected areas (MICU, TICU, CCU, and POW) of a selected hospital.

Sample size

To assess the knowledge, practice and technique on hand hygiene, samples of 33 nurses were selected.

Sampling technique

The convenience sampling technique was used to select the nurses for this study.

Inclusion criteria

The study included nurses who were working in selected areas (TICU, MICU, CCU, Post operative ward)of a selected hospital.

Exclusion criteria

- ANMS
- Student Nurses

Data Collection tool

Description of tool

The tools used in this study were demographic variable proforma, questionnaire on assessing knowledge, observation checklists on assessing practice and technique on hand hygiene among the nurses.

Section-A of this tool consisted of demographic variables which were collected through interview among the nurses.

Section -B of this contained questionnaire on assessing knowledge on hand hygiene among the nurses. It consisted of thirty questions regarding knowledge on hand hygiene. The score of one was given for correct response and zero was given for incorrect response. The total score was 30.

Grading for knowledge score

>80%	Highly adequate
65% - 79%	Adequate
50% - 64%	Moderately adequate
Below 50%	Inadequate

Blue print of the tool

Content	Knowledge	No of Items	Comprehension	No of Items	Skills	No of Items	total
Hospital acquired infection	1,2,3,4,5,6	6	-	0	-	0	6
Hand Hygiene	7,8,9,10	4	-	0	-	0	4
Hand washing practice & Technique	-	0	12,15,22	3	11, 13,14,16, 17,18,19,20, 21,	9	12
Alcohol hand rub practice & Technique	-	0	28	1	23,24,25, 26,27,29,30	7	8
total %	33 %	10	13 %	4	53%	16	30

Section –C of this tool consisted of the observation check list for assessing hand hygiene practice among the nurses. It consisted of 22 hand washing opportunities and performance before & after the procedure. The observations in this check list were categorized as low risk, medium risk & high risk. The number of the times, in which the nurses had an opportunity to practice hand hygiene, is marked in hand hygiene opportunity (HH OPP) column.

The number of the times, which the nurses performed hand hygiene is marked in 'Yes' column in hand hygiene observations and other observations which is not performed by nurses is marked in 'No column. YES - carries 1 mark; NO- carries 0 mark.

$$\text{Practice \%} = \frac{\text{Hand hygiene performance X 100}}{\text{Hand hygiene opportunity}}$$

Grading for practice score

>80%	Excellent
65% - 79%	Good
51% - 64%	Average
Below 50%	Poor

Section D of this tool contained observation check list for assessing hand hygiene technique among the nurses. It consisted of 24 observations. If nurses performed correct technique, tick mark was put on the 'Yes' option. If not, tick mark was put on the 'No' option. YES - carries 1 mark; NO- carries 0 mark.

Grading for technique score

>80%	Excellent
65% - 79%	Good
51% - 64%	Average
Below 50%	Poor

Validity

The tool was developed through a review of literature. For content validity, the tool was reviewed by experts in the area of study.

Reliability

Reliability of the knowledge questionnaire was established by test retest method with the score of 0.86 and observation check lists on hand hygiene practice and technique by inter rater reliability method with the score of 0.87.which indicates that the tool was valid and reliable.

Pilot study

The pilot study was conducted on 6 samples of nurses. The results proved that the instrument was valid and reliable and the present study was feasible to conduct.

Data collection procedure

Investigator conducted the study for 6weeks.The data collection was done in three different shifts (morning, afternoon, evening) in TICU, MICU, CCU and POW among 33 nurses. Assessment of the practice, technique on hand hygiene was done by using concealed participatory observation method. The knowledge was assessed by providing questionnaire after getting oral consent from the nurses on the last day of data collection in each of the four setting

Human rights protection

The pilot study and main study were conducted only after approval of the research proposal by the college of nursing and the institutional ethical committee. The permission for conducting the study was obtained from the administrative heads. The verbal consent was obtained only for assessing the knowledge and the consent was not obtained for assessing practice and technique, being a concealed study

CHAPTER IV

DATA ANALYSIS AND INTERPRETATION

Chapter IV deals with data analysis and interpretation. Data analysis is defined as the method of organizing data in such a way that the research question can be answered. Interpretation is the process of making sense of the result and of examining the simplification of finding with in a broader context. (Polit and Beck 2004).

Organization of findings

The findings of the study based on the descriptive and inferential statistical analysis are presented under the following headings.

Section 1: Distribution of sample according to demographic characteristic.

Section 2: Existing level of knowledge on hand hygiene among nurses.

Section 3: Existing level of Practice & technique on hand hygiene among nurses.

Section 4: Correlation between knowledge, practice and technique among nurses.

Section 5: Association between knowledge, Practice & technique scores and demographic variables among nurses.

SECTION 1

This section consists of distribution of sample according to demographic characteristics.

Table 1: Distribution of sample according to demographic characteristics.

Demographic Variables	Nurses(n=33)	
	No.	%
1. Age in years		
a) Below 25 yrs	28	84.8
b) 26 - 30 yrs	2	6.1
c) 31 – 35 yrs	2	6.1
d) Above 36 yrs	1	3.0
2. Gender		
a) Male	2	6.1
b) Female	31	93.9
3. Educational qualification		
a) DGNM	14	42.4
b) B.Sc.	19	57.6
4. Timing of duty		
a) 7 am. to 2 pm	11	33.3
b) 2 pm to 9 pm	11	33.3
c) 9 pm to 7 am	11	33.3
5. Setting		
a) TICU	10	30.0
b) Post operative ward	10	30.3
c) MICU	9	27.3
d) CCU	4	12.1
6. Present work experience		
a) 0 to 6 months	9	27.3
b) 7 to 12 months	16	48.5
c) 1 to 2 years	5	15.2
d) Above 2 years	3	9.1

7. Total years of work experience		
a) 0 to 6 months	6	18.2
b) 7 to 12 months	15	45.5
c) 1 to 2 years	3	9.1
d) Above 2 years	9	27.3
8. Previous source		
a) Yes	21	63.6
b) No	12	36.4
9. Previous source details		
a) Text book information	16	48.5
b) Workshop attended	4	12.1
c) In-service education	1	3.0
d) No	12	36.4

The table 1 reveals that the majority of the participants were females (93.9 %), below 25 years (84.8 %), B.sc nurses (57.6%). 45.5 % of the nurses were having the total work experience 7-12 months and 48.5% of the nurses were having 7-12 months experience in the current area. Only 21 nurses (63.3 %) had previous source of information on hand hygiene and 48.5%of the nurses got the information only from textbooks among them. Through the results, the researcher found that the selected hospital was having shortage of experienced staff nurses. The investigator felt that continuing education on hand hygiene can be provided to all the nurses to improve the knowledge.

SECTION 2

This section consists of existing level of knowledge on hand hygiene among nurses.

Figure 1 Mean knowledge score on hand hygiene among nurses (n=33).

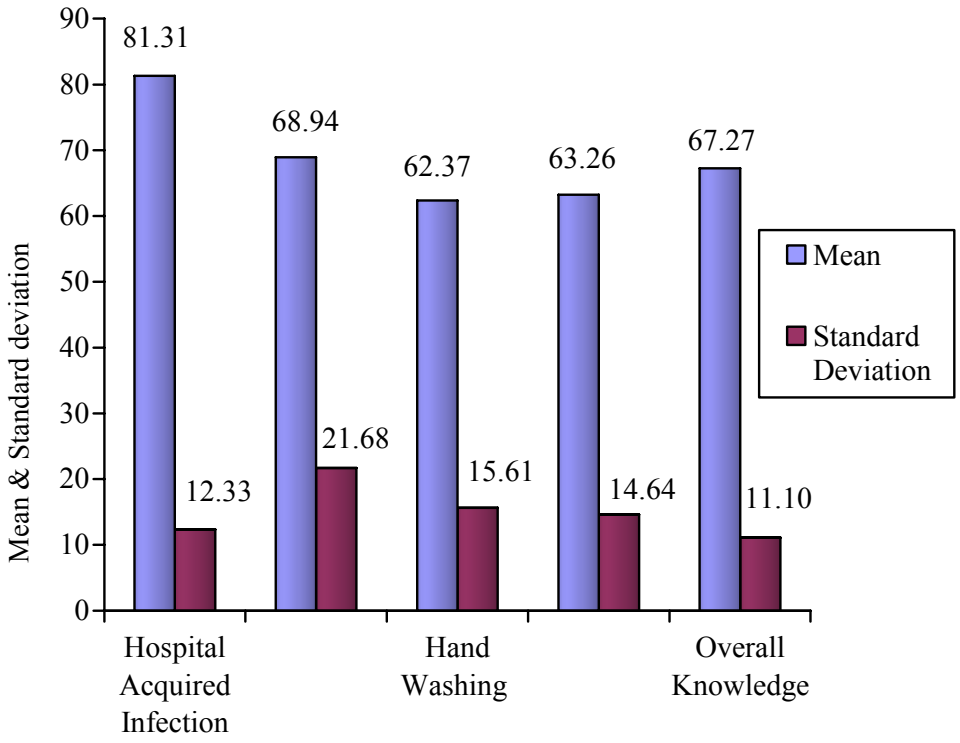


Figure 1 shows that the nurses were having the high mean knowledge score of (81.31) with standard deviation (12.33) on hospital acquired infection .They had almost same score(60 to 70) on all other aspects(hand hygiene, hand washing practice & technique, alcohol hand rub practice &technique). These results imply the need of conducting an in-service education on hand hygiene to update the knowledge among the nurses.

Table 2: Percentage distribution of knowledge score on hand hygiene among Nurses (n=33).

Knowledge Aspects	Inadequate Knowledge		Moderately Adequate Knowledge		Adequate Knowledge		Highly Adequate	
	No.	%	No.	%	No.	%	No.	%
Hospital Acquired Infection	2	6.1	0	0.0	5	15.2	26	78.8
Hand Hygiene	11	33.3	0	0.0	16	48.5	6	18.2
Hand Washing	9	27.3	4	12.1	16	48.5	4	12.1
Alcohol Hand Rub Practice	11	33.3	10	30.3	8	24.2	4	12.1
Overall Knowledge	3	9.1	12	36.4	13	39.4	5	15.2

Table 2 reveals that the majority of the participants (78.8 %) were having highly adequate knowledge on hospital acquired infection. Regarding hand washing& hand hygiene, 48.5% of them were having adequate knowledge ,where as for alcohol hand rub, only 24.2%were having adequate knowledge. It also noted that only 15.2% of the nurses had highly adequate knowledge overall.

SECTION 3

This section consists of existing level of practice & technique on hand hygiene among nurses.

Figure 2 Mean practice score on hand hygiene among nurses before and after procedure

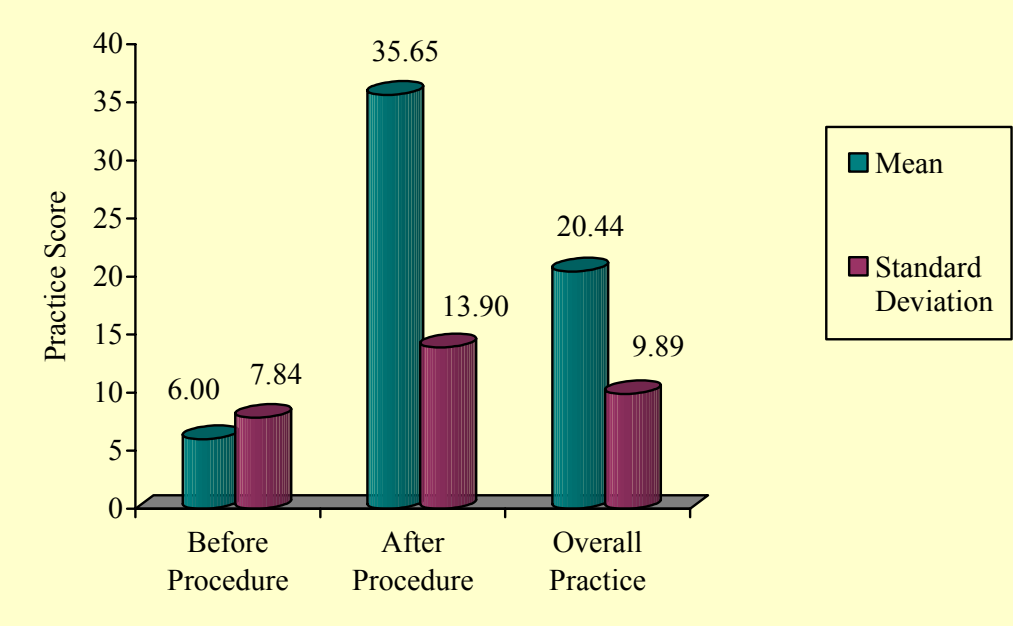


Figure 2 reveals that nurses were having the mean practice score of 35.65 with the standard deviation of 13.90 after procedure and the mean practice score of 6 with standard deviation of 7.84 before procedure. It reveals that though the nurses had more adherences to hand hygiene after procedure than before procedure, still the overall mean practice score was 20.44 only with standard deviation of 9.89.

Figure 3 Mean practice score on hand hygiene among nurses at different levels

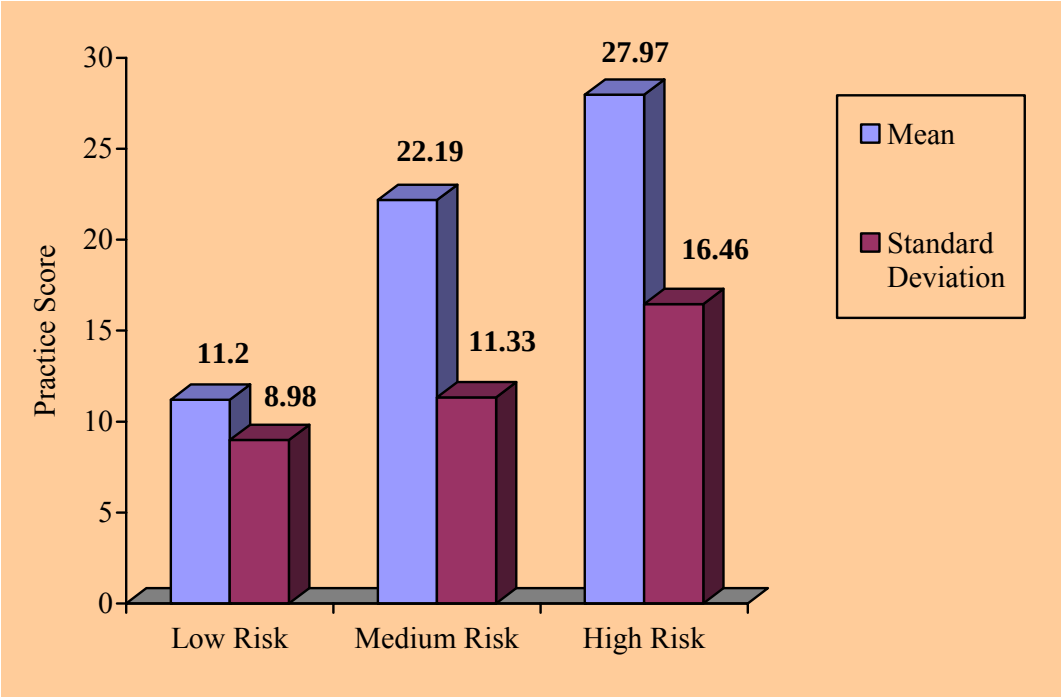


Figure 3 reveals that a mean score of 27.97was noted for practice on hand hygiene in high risk category with the standard deviation of 16.46 but for medium and low risk category was 22.19 and 11.9 respectively. This showed that nurses were comparatively more cautious while performing high risk procedures.

Figure 4 Mean technique score on hand hygiene among nurses

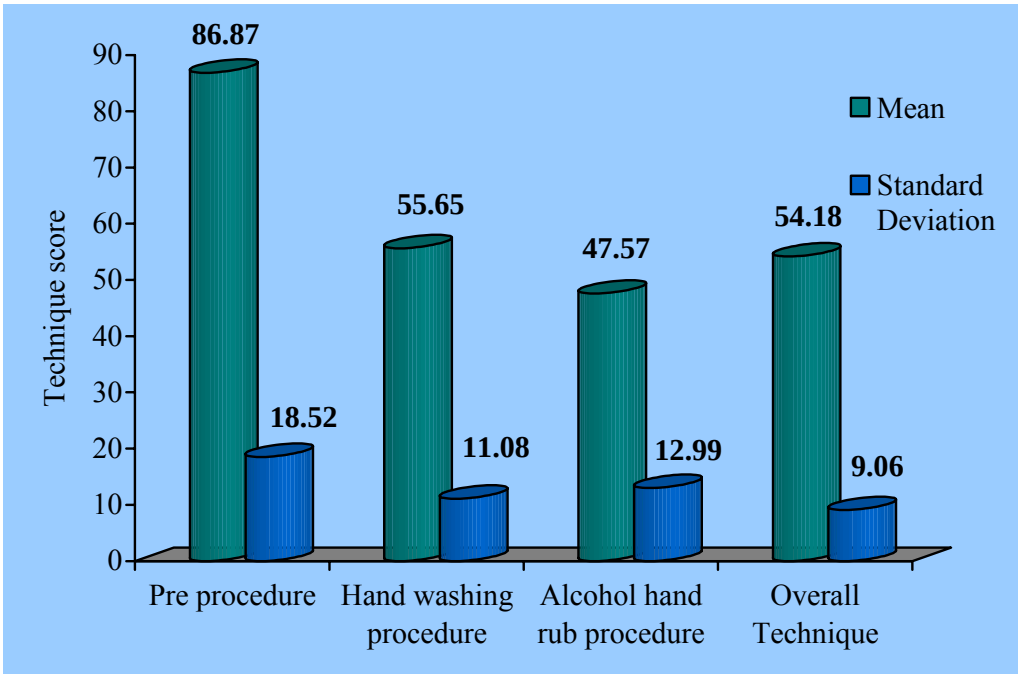


Figure 4 reveals that a high mean score of 86.87 was noted for pre procedure technique on hand hygiene with the standard deviation of 18.52. They had almost same score (45 to 60) on all other aspects (hand washing & alcohol hand rub procedure).

Figure 5 Distribution of level of practice score on hand hygiene among nurses before and after procedures

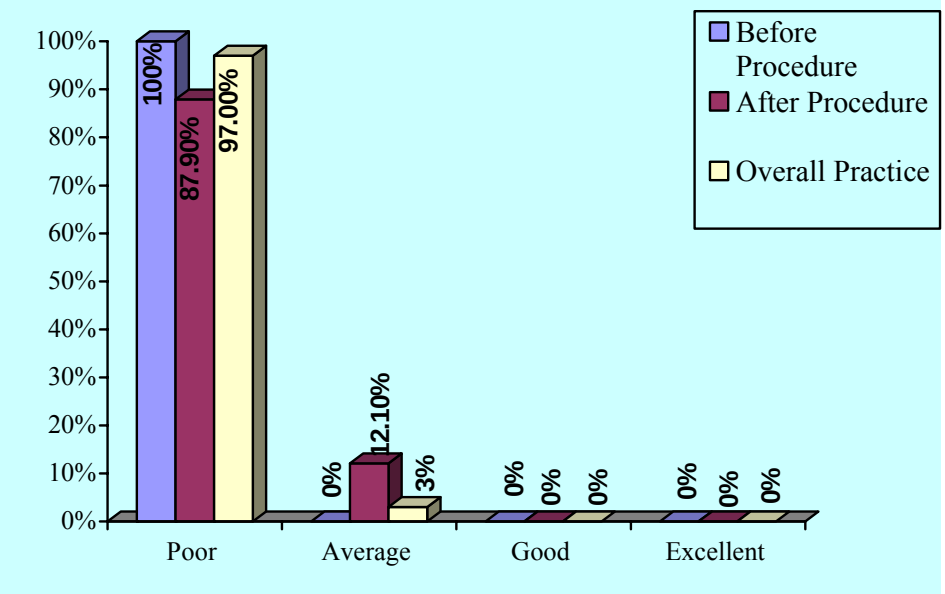


Figure 5 reveals that 97 % of the nurses were having poor (<50 %) total hand hygiene practice and 100 % of the nurses were having poor (<50%) hand hygiene practice before procedure. Through the results, the researcher found that the practice on hand hygiene among the nurses can be improved by multi method approach.

Figure 6 Distribution of level of practice on hand hygiene among nurses at different levels

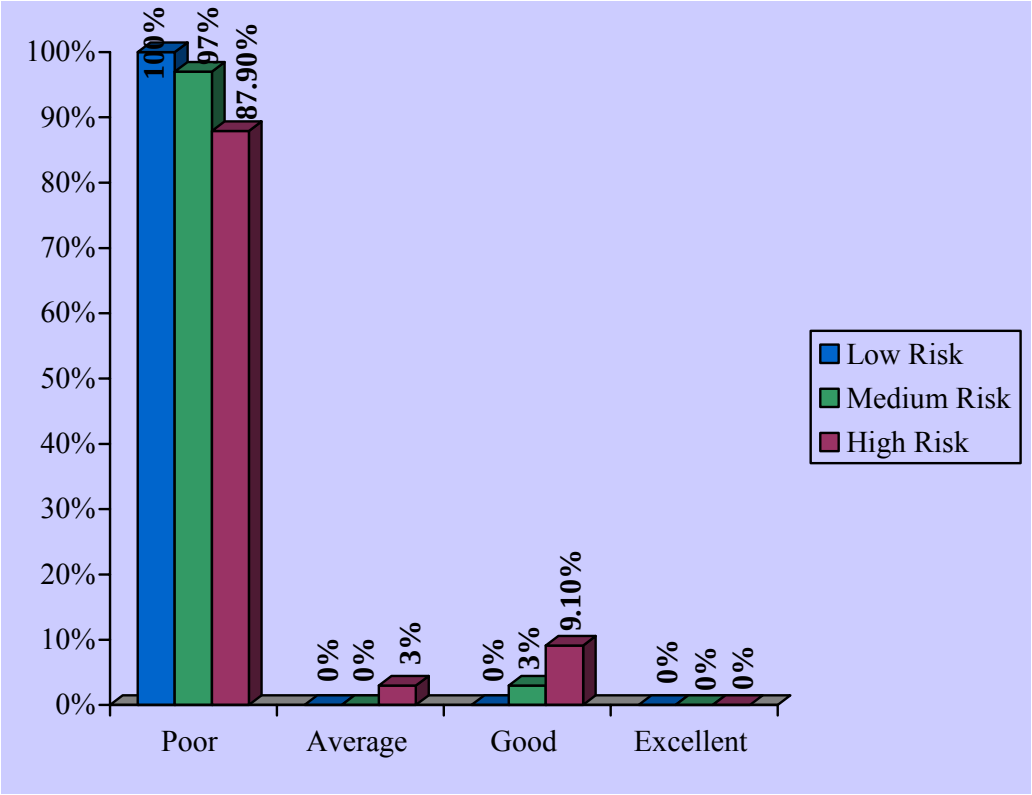


Figure 6 reveals that all the nurses were having poor (<50%) hand hygiene practice at low risk level followed by 97 % of the nurses were having poor (<50%) hand hygiene practice at medium risk level and 87.9 % of the nurses were having poor hand hygiene practice at high risk level.

Figure 7 Distribution of level of technique score on hand hygiene among nurses

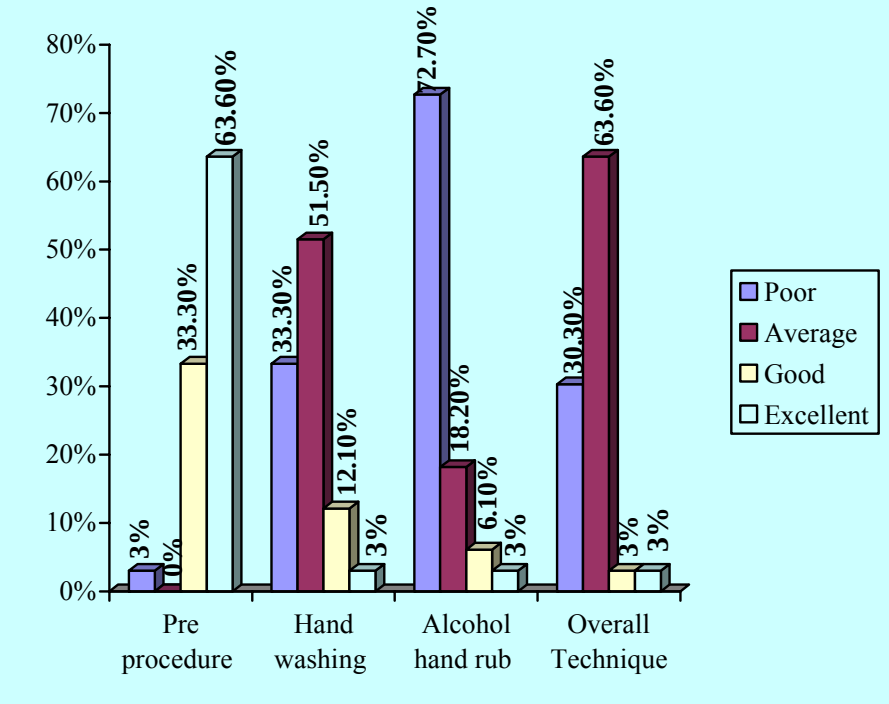


Figure 7 reveals that 63.6 % of the nurses were having excellent score (>80%) for pre procedure followed by 51.5 % of the nurses were having average score (51 to 64%) and 72.7 % of the nurses had poor score (<50 %) for alcohol hand rub. It also revealed that 63.6 % of nurses were having average technique score overall. The results inferred that continuous supervision, feedback monitoring and positive reinforcement are needed to improve the adherence to hand hygiene technique among the nurses.

SECTION 4

This section consists of correlation between knowledge, practice and technique among nurses.

Table 3: Correlation between knowledge, practice and technique among nurses

Score	Knowledge Score		Practice Score	
	r - value	**P - value**	**r - value**	**P - value**
Technique	r = -0.113	P = 0.531 (N.S)	r = 0.321	P = 0.069 (N.S)
Practice	r = -0.275	P = 0.122 (N.S)		

Table 3 shows that there was a negative correlation between knowledge with practice and technique. It was also revealed that there was a positive correlation between practice and technique. There was no significant relationship between knowledge, practice and technique. This could be interpreted that even though the nurses had adequate knowledge, continuous monitoring was needed to enhance adherence to practice and technique on hand hygiene.

SECTION 5

This section consists of association between knowledge, practice & technique scores and demographic variables among nurses

Table 4: Association between knowledge scores and demographic variables among nurses

Demographic Variables (n=33)	Inadequate		Moderately Adequate		Adequate		Highly Adequate		Chi Square value & P value
	No.	%	No.	%	No.	%	No.	%	
1. Age in years									
a) Below 25 yrs	1	3.6	11	39.3	12	42.9	4	14.3	χ 2 = 18.547,
b) 26 - 30 yrs	1	50	0	0	0	0	1	50	d.f = 9
c) 31 – 35 yrs	0	0	1	50	1	50	0	0	P=0.029 *
d) Above 36 yrs	1	100	0	0	0	0	0	0	
2. Gender									χ 2 = 5.077,
a) Male	1	50	0	0	1	50	0	0	d.f = 3
b) Female	2	6.5	12	38.7	12	38.7	5	16.1	P=0.166 (N.S)
3. Educational qualification									χ 2 = 5.187,
a) DGNM	3	21.4	5	35.7	5	35.7	1	7.1	d.f = 3
b) B.Sc.	0	0	7	36.8	8	42.1	4	21.1	P=0.159 (N.S)
4. Timing of duty									χ 2 = 3.915,
a) 7 am. to 2 pm	1	9.1	5	45.5	5	45.5	0	0	d.f = 6
b) 2 pm to 9 pm	1	9.1	3	27.3	5	45.5	2	18.2	P=0.688 (N.S)
c) 9 pm to 7 am	1	9.1	4	36.7	3	27.3	3	27.3	
5. Setting									
a) TICU	2	20	0	0	6	60	2	20	χ 2 = 12.176,
b) POW	1	10	4	40	3	30	2	20	d.f = 9
c) MICU	0	0	6	66.7	3	33.3	0	0	P=0.204 (N.S)
d) CCU	0	0	2	50	1	25	1	25	

6.Present work experience									
a) 0 to 6 months	1	11.1	3	33.3	4	44.4	1	11.1	$\chi 2 = 8.689$,
b) 7 to 12 months	0	0	7	43.8	5	31.3	4	25	d.f = 9
c) 1 to 2 years	1	20	2	40	2	40	0	0	P=0.466 (N.S)
d) Above 2 years	1	33.3	0	0	2	66.7	0	0	
7. Total years of experience									
a) 0 to 6 months	1	16.7	2	33.3	2	33.3	1	16.7	$\chi 2 = 6.292$,
b) 7 to 12 months	0	0	7	46.7	5	33.3	3	20	d.f = 9
c) 1 to 2 years	0	0	1	33.3	2	66.7	0	0	P=0.710 (N.S)
d) Above 2 years	2	22.2	2	22.2	4	44.4	1	11.1	
8. Previous source									$\chi 2 = 2.357$,
a) Yes	2	9.5	7	33.3	10	47.6	2	9.5	d.f = 3
b) No	1	8.3	5	41.7	3	25	3	25	P=0.502 (N.S)
9. Previous source details									
a) Text book	2	12.5	5	31.3	8	50	1	6.3	$\chi 2 = 5.739$,
b) Workshop	0	0	1	25	2	50	1	25	d.f = 9
c) In-service	0	0	1	100	0	0	0	0	P=0.766 (N.S)
d) No	1	8.3	5	41.7	3	25	3	25	

Note: * - P<0.05 Level of Significant, N.S. – Not Significant

Table 4 reveals that the age of the nurses had significant association with knowledge on hand hygiene at the level of P<0.05. None of the other demographic variables had significant association with knowledge on hand hygiene

Table 5: Association between technique score and demographic variables among nurses

Demographic Variables(n=33)	Poor (<50%)		Average (51-64%)		Good (65 – 75%)		Chi Square value & P value
	No.	%	No.	%	No.	%	
1. Age in years							
a) Below 25 yrs	9	32.1	18	64.3	1	3.6	$\chi 2 = 17.398$,
b) 26 - 30 yrs	1	50	1	50	0	0	d.f =6
c) 31 – 35 yrs	0	0	2	100	0	0	P=0.008 **
d) Above 36 yrs	0	0	0	0	1	100	
2. Gender							$\chi 2 = 1.217$,
a) Male	0	0	2	100	0	0	d.f = 2
b) Female	10	32.3	19	61.3	2	6.5	P=0.544 (N.S)
3. Educational qualification							$\chi 2 = 2.899$,
a) DGNM	4	28.6	8	57.1	2	14.3	d.f = 2
b) B.Sc.	6	31.6	13	68.4	0	0	P=0.235 (N.S)
4. Timing of duty							
a) 7 am. to 2 pm	3	27.3	7	63.6	1	9.1	$\chi 2 = 1.200$,
b) 2 pm to 9 pm	3	27.3	7	63.6	1	9.1	d.f = 4
c) 9 pm to 7 am	4	36.4	7	63.6	0	0	P=0.878 (N.S)
5. Setting							
a) TICU	1	10	9	90	0	0	$\chi 2 = 5.287$,
b) Post operative ward	4	40	5	50	1	10	d.f = 6
c) MICU	3	33.3	5	55.6	1	11.1	P=0.508 (N.S)
d) CCU	2	50	2	50	0	0	

6.Present work experience							
a) 0 to 6 months	1	11.1	8	88.9	0	0	$\chi 2 = 17.858$,
b) 7 to 12 months	8	50	8	50	0	0	d.f = 6
c) 1 to 2 years	1	20	2	40	2	40	P=0.007 **
d) Above 2 years	0	0	3	100	0	0	
7. Total years of experience							
a) 0 to 6 months	1	16.7	5	83.3	0	0	$\chi 2 = 9.462$,
b) 7 to 12 months	7	46.7	8	53.3	0	0	d.f = 6
c) 1 to 2 years	1	33.3	1	33.3	1	33.3	P=0.149 (N.S)
d) Above 2 years	1	11.1	7	77.8	1	11.1	
8. Previous source							$\chi 2 = 4.108$,
a) Yes	6	28.6	15	71.4	0	0	d.f = 2
b) No	4	33.3	6	50	2	16.7	P=0.128 (N.S)
9. Previous source details							
a) Text book information	4	33.3	6	50	2	16.7	$\chi 2 = 5.500$,
b) Workshop attended	4	25	12	75	0	0	d.f = 6
c) In-service education	2	50	2	50	0	0	P=0.481(N.S)
d) No	0	0	1	100	0	0	

Note: ** - P<0.01 Level of Significant, N.S. – Not Significant

Table 5 indicates that the age and present experience of the nurses also had significant association with technique on hand hygiene at the level of P<0.01. None of the other demographic variables had a significant association with technique on hand hygiene.

Table 6: Association between overall practice score and demographic variables among nurses

Demographic Variable (n=33)	Practice score			F – Test Value & P – Value
	Number	Mean	S.D.	
1. Age in years				
a) Below 25 yrs	28	18.36	5.64	F= 20.658 P= 0.000 ***
b) 26 - 30 yrs	2	27.12	4.98	
c) 31 – 35 yrs	2	21.02	10.68	
d) Above 36 yrs	1	64.28	0.0	
2. Gender				
a) Male	2	21.54	2.91	F= 0.025
b) Female	31	20.37	10.20	P=0.875 (N.S)
3. Educational qualification				
a) DGNM	14	22.07	13.46	F= 0.654
b) B.Sc.	19	19.24	6.28	P=0.425 (N.S)
4. Timing of duty				
a) 7 am. to 2 pm	11	25.84	13.89	F= 2.743 P= 0.081 (N.S)
b) 2 pm to 9 pm	11	18.09	3.21	
c) 9 pm to 7 am	11	17.39	7.84	
5. Setting				
a) TICU	10	16.20	4.78	
b) Post operative ward	10	26.01	14.88	F= 2.058
c) MICU	9	20.67	6.64	P=0.128 (N.S)
d) CCU	4	16.60	3.19	
6. Present work experience				
a) 0 to 6 months	9	16.18	7.14	
b) 7 to 12 months	16	20.33	5.69	F= 2.453
c) 1 to 2 years	5	29.95	19.70	P=0.083 (N.S)
d) Above 2 years	3	17.97	5.16	
7. Total years of experience				
a) 0 to 6 months	6	16.29	8.92	
b) 7 to 12 months	15	19.64	5.15	F= 1.397
c) 1 to 2 years	3	17.01	3.56	P=0.264 (N.S)
d) Above 2 years	9	25.68	15.58	
8. Previous source				
a) Yes	21	22.96	14.80	F= 1.230
b) No	12	19.00	5.49	P=0.276 (N.S)

9. Previous source details				
a) Text book information	16	18.63	5.32	
b) Workshop attended	4	18.11	5.21	F= 0.718
c) In-service education	1	28.57	0.0	P=0.549 (N.S)
d) No	12	22.96	14.80	

Note: *** - P<0.001, Level of Significant, N.S. – Not Significant

Table 6 reveals that the age of the nurses had significant association with practice on hand hygiene at the level of P<0.001. None of the other demographic variables had significant association with practice on hand hygiene.

CHAPTER V

DISCUSSION

This chapter deals with discussion of study finding. The present study was designed to evaluate the knowledge, practice and technique on hand hygiene among 33 nurses. The descriptive design was used to assess the knowledge, practice and technique on hand hygiene among nurses in Trauma ICU, Medical ICU, CCU, Post operative ward at a selected hospital.

The demographic characteristics reveal that majority of the participants were females (93.9%), below 25 years (84.8 %), B.sc nurses (57.6%). It could be interpreted that the females led the nursing field and also there was a steady growth of B.Sc. nursing graduates .45.5 % of the nurses were having 7-12 months of total work experience and 48.5 % of them were having 7-12 months of experience in the current area. It is inferred that these selected areas had young nursing population than experienced ones. Only 21 nurses 63.3 % had previous source of information on hand hygiene and 48.5% of them got the information only from textbooks. The investigator felt that continuing education on hand hygiene can be provided to all the nurses.

The first objective was to assess the knowledge on hand hygiene among nurses while caring for patients

Figure 1 shows that the nurses were having the high mean knowledge score of 81.31 with standard deviation of 12.33 on hospital acquired infection. They had almost same score of 60 to 70 on all other aspects like hand hygiene, hand washing practice &technique, alcohol hand rub practice& technique. These results imply the need of conducting an in-service education on hand hygiene to update the knowledge among nurses.

Table 2 reveals that the majority of the participants 78.8 % were having highly adequate knowledge on hospital acquired infection. Regarding hand hygiene &hand washing 48.5% were having adequate knowledge ,whereas for alcohol hand rub, only 24.2% had adequate knowledge .It was also noted that only15.2% of the nurses had highly adequate knowledge overall. Through these results, the researcher found that the in-service education can be conducted to improve the knowledge on hand hygiene in order to reduce the incidence of nosocomial infections.

These results can be supported by the study of JB Suchitra, N Lakshmi Devi (2007) among 150 HCWs, doctors (n=50), nurses (n=50) and nursing aides (n=50) on nosocomial infections. Subjects in each category of staff (n=10) were observed for compliance to hand washing practices in the ward after giving an education. The study showed an increase in the number of subjects in each category scoring good and excellent in the post-education questionnaire. Total compliance was 63.3% (95% CI= 58.80-88.48).The study stressed that an education has a positive impact on retention of knowledge, attitudes and practices in all the categories of staff. In order to reduce the incidence of nosocomial infections, compliance with interventions are mandatory.

The second objective was to assess the practice and technique on hand hygiene among nurses

Figure 2 infers that 63.6 % of the nurses had average score on hand hygiene technique and very less number of nurses (3 %) were having excellent and good score. The result necessitates the need for continuing education, supervision, feedback monitoring and positive reinforcement.

Figure 3 reveals that nurses were having the mean practice score of 35.65 with the standard deviation of 13.90 after procedure and the mean practice score of 6 with

standard deviation of 7.84 before procedure. It revealed that though the nurses had more adherences to hand hygiene after procedure than before procedure still the overall mean practice score was 20.44 only with standard deviation of 16.46. The investigator felt that continuous education and reinforcement are required for the nurses to improve the adherence to hand hygiene practices.

A mean score of 27.97 was noted for practice on hand hygiene in high risk category but for medium risk and low risk category it was 22.19 & 11.2 respectively. (Figure4). This showed that nurses were comparatively more cautious while performing high risk procedures.

Figure 5 reveals that 97 % of the nurses were having poor (<50 %) total hand hygiene practice and 100 % of the nurses were having poor (<50%) hand hygiene practice before procedure. Through the results, the researcher found that the practice on hand hygiene among the nurses should be improved by multi method approach.

Figure 6 reveals that all the nurses were having poor (<50%) hand hygiene practice at low risk level followed by 97 % of the nurses were having poor (<50%) hand hygiene practice at medium risk level and 87.9 % of the nurses were having poor hand hygiene practice at high risk level.

In this study, the researcher noted a lack of alcohol-based hand rub on each bed and non availability of dry towel as the major deficiencies. It was also found that breaks in the technique were common, and duration of hand washing and using alcohol hand rub was too short. Similar findings were observed in the study conducted by Fox M. K., et.al (2005) on hand washing technique among 90 nursing personnel.

In this study the researcher found that there was one sink for10-15 beds. Voss et al. (2004) documented that it took an average of 62 seconds for intensive care

nurses to walk to a sink, wash hands, and return to patient care in the intensive care settings. The investigator felt that providing one more sink in these areas might reduce the time consumption for carrying out hand hygiene and thereby increasing the adherence.

The finding of the present study explains that most of the nurses were not practicing hand hygiene after glove removal. Observational study by Olsen et al. (2004) demonstrated that healthcare workers contaminated their hands with patient skin flora despite wearing gloves during patient contact, presumably via tiny holes in gloves or by contaminating their hands while removing gloves. It emphasizes the need of cleaning the hands after glove removal.

The third objective was to find out the correlation between knowledge, practice and technique

Table 3 shows that there was a negative correlation between knowledge with, practice and technique. It also revealed that there was a positive correlation between practice and technique. There was no significant relationship between knowledge, practice and technique. This could be interpreted that even though the nurses had adequate knowledge, continuous monitoring was needed to enhance adherence to practice and technique on hand hygiene. A similar study was conducted in 2004, (Kennedy et.al) in NICU to assess the knowledge on hand hygiene practices among nurses. They reported that there were significant deficits in the knowledge and also there was no connection between knowledge and practice.

The fourth objective was to find out the association of knowledge, practice and technique on hand hygiene with selected demographic variables

The study finding reveals that the age of the nurses had significant association with knowledge on hand hygiene at the level of $P<0.05$.It was interpreted that nurses between 31-35 years were having more knowledge on hand hygiene. The age and present experience of the nurses had significant association with technique on hand hygiene at the level of $P<0.01$. It also reveals that the age of the nurses had significant association with practice before and after procedure on hand hygiene of nurses at the level of $P<0.001$ .No other demographic variables had significant association with knowledge, practices and techniques on hand hygiene. It was clearly stated that experienced nurses had more knowledge, practice and technique than young nurses. So the researcher felt that experienced nurses in the hospital can educate, supervise and monitor the young nurses to improve the knowledge, practice and technique.

Inspite of many promotive measures for hygiene among health care workers, it was found that hand hygiene practices were not adhered as required. Continuing education, 'feedback monitoring', supervision and positive reinforcements are very much essential on a regular basis to improve the important aspects of infection prevention. An in-service education was conducted on hand hygiene in TICU, Postoperative ward, CCU, and MICU for the nurses.

CHAPTER VI

SUMMARY, CONCLUSION, LIMITATIONS, IMPLICATIONS, & RECOMMENDATIONS

Summary

A study was conducted to assess the knowledge, practice and technique on hand hygiene among 33 nurses while caring for patients in Medical ICU, Coronary care unit, Trauma ICU and Post operative ward at selected hospital. The conceptual frame work was developed on the basis of Becker and Miman's health belief model. An extensive review of literature and guidance by experts formed the foundation to the development of the study tools.

In this study, quantitative research approach and descriptive research design were used to achieve the objectives of the study. The data collection tools were validated by medical, nursing experts. The reliability value of 0.86 for knowledge questionnaire and 0.87 for observation check lists were established. Pilot study was done and all the strengths and weaknesses were analyzed. Data collection was done for 6 weeks. Assessment of practice and technique on hand hygiene among the nurses were done by concealed participatory observation method and questionnaire was provided on the last two days in each of the four settings to assess the knowledge on hand hygiene among the nurses. The collected data were tabulated and analyzed using descriptive and inferential statistics.

The demographic characteristics revealed that the majority of the participants were females (93.9),below 25 years (84.8 %),B.Sc. nurses(57.6%). 45.5% nurses were having 7-12 months of total work experience and 48.5% of them were having 7-

12 months experience in the current area. Only 63.3 % of the nurses had previous source of information on hand hygiene and among this group 48.5%of the nurses got the information only from textbooks. It was noted that 39.4% of the nurses had adequate knowledge. It was also noted that 21 nurses (63.6%) were having the average (51%-64%) score on hand hygiene technique, whereas one nurse (3%) was having the excellent (> 80%) and good score (65 – 75%) on hand hygiene technique. It was also revealed that the practice on hand hygiene before and after procedure was poor (<50 %) for all the nurses .None of the participants were having good & excellent hand hygiene practice before and after procedures.

It was noted that the age of the nurses had significant association with knowledge on hand hygiene at the level of $P<0.05$. The age and present experience of the nurses had significant association with technique on hand hygiene at the level of $P<0.01$. It was also revealed that the age of nurses also had a significant association with practice before and after procedure on hand hygiene of nurses at the level of $P<0.001$. It was also noted that there was a negative correlation between knowledge with practice and technique. It was also revealed that there was a positive correlation between practice and technique. There was no significant relationship between knowledge, practice and technique. This could be interpreted that even though the nurses had adequate knowledge, continuous monitoring was needed to enhance adherence to practice and technique on hand hygiene. The results were revealed that an in service education should be conducted periodically for updating their knowledge. The continuous supervision and monitoring of hand hygiene practice should be done to improve the nurses' adherence to practice and technique. The

researcher conducted inservice education on hand hygiene among the nurses in all of the four settings.

Conclusion

Through the present study, researcher found that the knowledge and practice on hand hygiene among nurses were poor in all the study setting and the technique on hand hygiene among nurses was average in all the study setting. The study results showed that the continuous in-service education should be conducted for updating the nurses' knowledge and continuous feedback monitoring , supervision of hand hygiene practice and providing rewards for better practice on hand hygiene should be followed to improve the hand hygiene practice and technique among nurses.

Limitations

The study was conducted only among nurses from selected hospital. So generalization is possible only for the selected samples.

The study was done only with 33 nurses; hence generalization is only for the small samples.

The study was done in intensive care setting &post operative ward. So generalization is possible only for the selected areas.

The continuous in-service education should be conducted to all the nurses in hospital.

Nursing Implications

The findings of the study have implications in various areas of nursing profession like nursing practice, nursing education, nursing administration, nursing research.

Nursing practice

The present study will help the nurses to know their knowledge and practice on hand hygiene. The study will emphasize in reducing the nosocomial infections by practicing hand hygiene. Nurses can be provided in-service education to update their knowledge and practice regarding hand hygiene. Knowledge and practice on hand hygiene is essential for nurses because it reduces the hospital acquired infections as well as the cost effectiveness and length of hospitalization. Constant reinforcement and supervision will help the nursing personnel to practice hand hygiene strictly as much as possible. Periodical conferences, seminars, symposium can be arranged regarding hand hygiene practice and technique. The findings of the study have to be applied on evidence based nursing practice.

Nursing education

"A Stitch in time saves nine"

During the basic period of fundamentals of nursing, the nursing students should be taught and explained about the importance of hand hygiene. Insisting the use of hand hygiene helps in prevention of nosocomial infections. The in-service education which has been conducted by the investigator helps the student nurses, trained nurses to understand the importance of hand hygiene. The study also enlightens the fact that knowledge on hand hygiene among nursing personnel can promote their practice and technique. The nurse educator is needed to be equipped with curriculum emphasizing the role of hand hygiene in prevention and control of Hospital acquired infections.

Nursing administration

Nurse administrator should take initiative to conduct the periodical in service education programme in order to minimize hospital acquired infections. Hand hygiene practice manual must be formulated and circulated to all the nurses. The protocol should be prepared and provided to the nurses. Nurse administrator should evaluate the practice and technique on hand hygiene by conducting regular clinical audit. The nurse administrator should support the nurses with needed equipments and supplies that would help to follow hand hygiene practice and technique. The nurse administrator should provide pamphlets/posters to each ward. Nurse administrator should emphasize and encourage the nurses to follow hand hygiene practice and technique by periodically conducting workshops, conferences etc.

Nursing research

Adequate allocation of funds, man power and time should be provided to the nurses for conducting research. The Nurse administrator should motivate for doing more research in this aspect. This study can motivate researchers to conduct experimental studies, further regarding hand hygiene which ultimately led the way to many research studies.

Recommendations

On the basis of the present study, the following recommendations can be made,

- A study can be conducted for a larger group on a long term basis.
- The same study can be conducted to find out the factors responsible for improper practice of hand hygiene.
- The study can be conducted among the nursing students in the clinical field

- The similar study can be conducted among the other disciplines who involved in the patient care
- A similar study can be conducted in other hospital settings &ward settings.
- In-service education may be conducted continuously to all categories of health personnel as per their job description.
- Standard protocol can be formulated by Hospital infection control committee and provided to all the wards in hospital settings.

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Appendix 1

TOOL FOR ASSESSING HAND HYGIENE KNOWLEDGE,

PRACTICE &TECHNIQUE OF NURSES

Demographic Profile

1. **Sample No:…….**
2. **Age**
    a. **Below 25 Years** □
    b. **26 -30 Years** □
    c. **31 – 35 Years** □
    d. **Above 36 Years** □
3. **Sex**
    a. **Male** □
    b. **Female** □
4. **Educational qualification**
    a. **DGNM** □
    b. **Bsc (N)** □
5. **Timing of duty**
    a. **7 am to 3 pm**
    b. **1pm to 9 pm**
    c. **9 pm to 7 am**

6. **Setting**

    a. **T ICU** □

    b. **Post operative ward** □

    c. **MICU** □

    d. **CCU** □

7. **Experience at present work area**

    a. **0 to 6 Months**

    b. **7 to 12 Months**

    c. **1 to 2 years**

    d. **Above 2years**

8. **Total years of work experience**

    a. **0 to 6 Months**

    b. **7 to 12 Months**

    c. **1 to 2 years**

    d. **Above 2years**

9. **Previous source of information ……..**

    a. **Yes**

    b. **No**

    If yes……..

Hand Hygiene Knowledge Assessment Questionnaire

Instruction: Read the following questions carefully and place a tick mark (✔) against the response .Each right answer carries one mark and wrong answer, zero mark

Hospital acquired infection

1) What is known as hospital acquired Infection?

a) Chronic Infection

b) Acute Infection

c) Nosocomial Infection

2) Which one is the universal precaution followed by the nurses to prevent hospital acquired infection?

a) Hand hygiene

b) Urinary hygiene

c) Dental hygiene

3) When are nurses at risk for getting hospital acquired infection?

a) Wearing gloves

b) Wearing ornaments in the hands

c) Wearing anklets

4) Which is the common source of hospital acquired Infection?

a) Nurse's poor hand hygiene

b) Sterilization of instruments

c) Vaccination

5) Which is the commonest infection occurring in hospital to the patients?

a) Respiratory tract infections

b) Skin Infections

c) Gastrointestinal infections

6) What is medical asepsis?

a) Clean technique

b) Sterile technique

c) Drying technique

Hand Hygiene

7) What is the meaning of hand hygiene?

a) Washing hands with water

b) Washing hands with soap and water or decontaminating with alcohol hand rub

c) Wearing gloves without hand washing

8) What is the purpose of hand hygiene?

a) Prevention of nosocomial infection

b) Skin integrity enhancement

c) Prevention of skin infection

9) Which method of hand hygiene is used to remove the resident microorganisms from the hands?

a) Hand washing with water

b) Alcohol hand rub

c) Hand washing with soap & water

10) Which method of hand hygiene is used to remove the transient microorganisms from the hands?

a) Hand washing with water

b) Hand washing with soap & water

c) Hand washing with soap solution

Hand washing with soap & water Practice & Technique

11) What are the essential elements of hand washing?

a) Soap, water and Friction

b) Water and Friction

c) Soap and water

12) What is the rationale for discouraging nail polish?

a) Obscuring the subungual space

b) Obscuring the fingers

c) Obscuring the nail plate

13) What is the technique used for washing the hands?

a) Rotary motion & holding hands down

b) Rubbing & holding hands up

c) Tapping motion & holding hands down

14) What is the rationale for keeping hands & fore arm lower than elbow during hand washing?

a) Prevention of rapid drying

b) Prevention of rinsing up of microorganisms

c) Prevention of rinsing down of microorganisms

15) Which organization set up the guidelines for hand washing in 1985?

a) CDC

b) WHO

c) UNICEF

16) Which type of hand hygiene is used if hands are visibly soiled?

a) Hand washing with soap and water

b) Alcohol hand rub

c) Hand drying

17) What is the disadvantage of using hand washing with soap & water?

a) Skin infection

b) Skin irritation and dryness

c) Skin injury

18) How much time should be taken for doing medical hand washing?

a) 15 seconds

b) 30 seconds

c) 60 seconds

19) How will you dry the hands after hand washing?

a) Drying is not necessary

b) From fore arm to wrists & fingers

c) From fingers to wrists & fore arm

20) How will you turn off the tap, after doing hand washing?

a) Elbow

b) Palm of the hands

c) Fingers

21) How many steps should be followed during hand washing?

a) 6 Steps

b) 5 Steps

c) 7 Steps

22) When will nurse's poor hand hygiene cause infection to patient?

a) Before doing procedures

b) After taking care of the patient

c) Before eating

Alcohol hand rub Practice & Technique

23) How much amount of alcohol is required for hand rub?

a) 1.5 ml - 3 ml

b) 3.5ml – 5 ml

c) 5.5 ml – 7 ml

24) What is the duration of using alcohol hand rub?

a) 15-30 seconds

b) 35-45 seconds

c) 55-70 seconds

25) Which is the safest place for storing alcohol hand rub?

a) Warm & wet place

b) Cool dry place

c) Hot & dry Place

26) Where should alcohol hand rub dispensers located?

a) Head end of the bed

b) Foot end of the bed

c) On the cardiac table

27) What is the advantage of using alcohol hand rub?

a) Less time consuming

b) Less accessible

c) Cost effective

28) When was alcohol based hand rub recommended by Association of professionals in infection control (APIC)?

a) 1988

b) 1985

c) 1979

29) How much length of the nails should be kept well manicured?

a) 3/4 inches

b) 1/2 inches

c) 1/4 inches

30) How much % of alcohol concentration is used in the effective hand rub technique?

a)10 % -25 %

b) 30 % -50 %

c) 60 % -95 %

Scoring key

Question No	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Key Answer	c	a	b	a	a	a	b	a	b	b	a	a	a	b	a
Score	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Question No	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Key Answer	a	b	c	c	a	c	a	a	a	b	b	a	a	c	c
Score	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

Hand Hygiene Practice Observation Tool

Sample No:							
Date:		**Before**			**After**		
Time:		**HH Opp**	**HH Performance**		**HH Opp**	**HH Performance**	
Sl.No			**Yes**	**No**		**Yes**	**No**
	Low Risk						
1	Touching sterile goods						
2	Making clean bed						
3	Contact with notes, telephone, computer						
4	Medication round						
5	Other						
	Low Risk Tally Total						
	Medium Risk						
6	Stripping a non-soiled bed						
7	Manipulating medical devices in immediate patient environment						
8	Helping to move patient in/out of bed						
9	Cleaning beds, furniture						
10	Observations (TPR & BP)						
11	Setting up & removing IVI, giving injections						
12	Wearing and removing gloves						
13	Bed bath						
14	Other						
	Medium Risk Tally Total						
	High Risk						
15	Dealing with bodily secretions (urine, faeces, blood) eg catheter bags						
16	Suctioning, tracheostomy care						
17	Wound dressings						
18	Phlebotomy, cannulation						
19	Between procedures on same patient						

20	Other						
	High Risk Tally Total						

Before procedures

Total HH OPP -

Total HH Performance-

After procedures

Total HH OPP -

Total HH Performance -

Note:

OPP-Opportunities

HH –Hand Hygiene

Adherence % =HH Performance X 100

HH Opportunities

Scoring key

YES - carries 1 mark; NO- carries 0 mark

Hand Hygienic Technique Observation Tool

Sample No:			
Date: **Time:**			
Sl.No	**Observation**	**Observation**	
		Yes	**No**
	Pre procedure		
1	Staff fingernails are clean and short		
2	Artificial nails are not observed		
3	Jewellery is not worn (wedding ring exempted)		
	Hand washing procedure		
4	Hands are wet first, then hand wash product is applied		
5	Rub palms together.		
6	Rub the back of both hands.		
7	Interlace fingers and rub hands together.		
8	Interlock fingers and rub the back of fingers of both hands.		
9	Rub thumb in a rotating manner followed by the area between index finger and thumb for both hands.		
10	Rub fingertips on palm for both hands.		
11	Rub both wrists in a rotating manner.		
12	Rinse and dry thoroughly using paper towel or single use towel, including under- ring area.		
13	Hands are rubbed together vigorously for at least 15 seconds		
14	Hands are rinsed free of soap		
15	The process should take 60 sec		
	Alcohol hand rub procedure		
16	3ml product is applied in cupped hand		
17	Rub palms together.		
18	Rub the back of hands with other hands, Interlace fingers and rub hands together.		
19	Rub palm to palm with interlaced fingers and rub hands together.		
20	Rub the back of fingers to opposing palm with interlocked fingers of both hands.		

21	Rub each thumbs clasped in opposite hand using rotating movement.		
22	Rub fingertips in a opposite palm in a circular motion.		
23	Rub both wrists with opposite hand.		
24	Wait until evaporation of product and drying hands.		
25	The process should take 15 to 30 sec		
	Total		
	Total Scoring		

YES - carries 1 mark; NO- carries 0 mark

Appendix 2

LESSON PLAN

ON HAND HYGIENE

Malar vizhi A

M.Sc(N) II year

Topic	:	Hand hygiene
Group	:	Trained Nurses
Name of the Teacher	:	Malar vizhi A
Method of teaching	:	Lecture cum discussion
Audio visual aids	:	Power point presentation

INTRODUCTION

Nosocomial infections are increasing alarmingly and are emerged as a critical issue in hospital care outcome. Opportunistic microorganisms primarily cause hospital acquired infections; and multidrug-resistant pathogens that are commonly involved in hospital acquired infections are difficult to treat.

“Hands that heal or harm.”

The hands of health care workers are the primary mode of transmission of these multidrug-resistant pathogens and infections to patients. Hand hygiene is one of the most effective means of reducing healthcare associated infection (HCAI). However compliance by nurses with recommended hand hygiene frequencies and techniques has been reported as suboptimal. Improving adherence with hand hygiene requires considerable effort to ensure nurses having access to appropriate equipment and supplies and have sufficient knowledge about the importance of hand hygiene.

CENTRAL OBJECTIVES

The participants will be able to acquire knowledge, practice & technique on hand hygiene and to develop the desirable attitudes and skills while giving nursing care to the patient

BEHAVIOURAL OBJECTIVES

The participants will be able to

- Define hand hygiene
- Illustrate Need for hand hygiene
- Mention the Present status of hospital & patient
- Explain the risk of nosocomial infections in ICU
- Explain the categorization of levels of risk for getting hospital acquired infections
- Describe hand hygiene technique

Sl.No	Time	Behavioral Objectives	Content	Teacher activity	Listener activity	AVI Aid
1	1minute	Define hand hygiene	**Hand Hygiene** • Hand hygiene is defined as hand washing or washing hands with soap and water or using a waterless hand sanitizer.	Explaining Questioning	Listening Answering	PPT
2	2minutes	Illustrate need for hand hygiene	**Need forhand hygiene** • Poor persistent hand washing can cause irritant dermatitis. • Irritant dermatitis results in carriage of more pathogenic organisms. • It is under performed in terms of frequency and quality. • The poor quality and frequency is not acknowledged by healthcare workers. • Nearly 5 billion US dollars is added to US health costs every year as a result of nosocomial infections. • Nearly 2 million patients annually get an infection while being treated for another injury. • Nearly 88,000 die as a direct cause of their infection (CDC,Atlanta,U.S.A)	Explaining Questioning	Listening Answering	PPT

Sl.No	Time	Behavioral Objectives	Content	Teacher activity	Listener activity	AVI Aid
3	2minutes	Mention the present status of hospital & patient	**The hospital & patients flora today** • More resistant to antibiotics. • Necessitates more toxic antibiotics. • More expensive to treat. • Causes greater anxiety among patients and healthcare workers. • More vulnerable than ever. • More severe consequences may develop as a result of hospital acquired infection**.**	Explaining Questioning	Listening Answering	PPT
4	2minutes	Explain the risk of hospital acquired infections in ICU	**Risk of hospital acquired infections in ICU** • ICU clients are critically ill • More invasive devices such as IV or intra arterial lines are used in ICU • More invasive procedures are performed in the ICU than in other general care areas • Often surgical procedures are performed in the ICU	Explaining Questioning	Listening Answering	PPT

			instead of operating room			
Sl.No	Time	Behavioral Objectives	Content	Teacher activity	Listener activity	AVI Aid

			• Over use of broad spectrum antibiotic course • The formation of resistant micro organisms that later cause infection • The pace of activities in an ICU can often cause nurses and other health care provider to become less diligent with aseptic technique			
5	4minutes	Explain the categorization of levels of risk for getting hospital acquired infections	**Low Risk** • Touching sterile goods • Making clean bed • Contact with notes, telephone, computer • Medication round **Medium Risk** • Stripping a non-soiled bed • Manipulating medical devices in immediate patient environment &helping to move patient in/out of bed • Cleaning beds, furniture • Observations (TPR & BP)	Explaining Questioning	Listening Answering	PPT
Sl.No	Time	Behavioral Objectives	Content	Teacher activity	Listener activity	AVI Aid

6	4miniutes	Describe the hand hygiene technique	• Setting up & removing IVI, giving injections • Wearing and removing gloves • Bed bath **High Risk** • Dealing with bodily secretions (urine, faeces, blood) eg catheter bags • Suctioning, tracheostomy care • Wound dressings • Phlebotomy, cannulation • Between procedures on same patient **Pre procedure** • Staff fingernails are clean and short • Artificial nails are not observed • Jewellery is not worn (wedding ring excepted) **Hand washing procedure** • Hands are wet first, then hand wash product is applied	Explaining Questioning Explaining Questioning	Listening Answering Listening Answering	PPT PPT

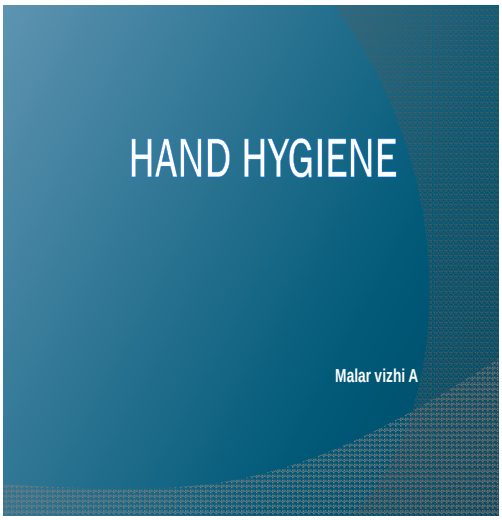
Sl.No	Time	Behavioral Objectives	Content	Teacher activity	Listener activity	AVI Aid
			• Rub palms together. • Rub the back of both hands. • Interlace fingers and rub hands together. • Interlock fingers and rub the back of fingers of both hands. • Rub thumb in a rotating manner followed by the area between index finger and thumb for both hands • Rub fingertips on palm for both hands. • Rub both wrists in a rotating manner. Rinse and dry thoroughly using paper towel or single use towel, including under- ring area. • Hands are rubbed together vigorously for at least 15 sec. Hands are rinsed free of soap • The process should take 60 sec			

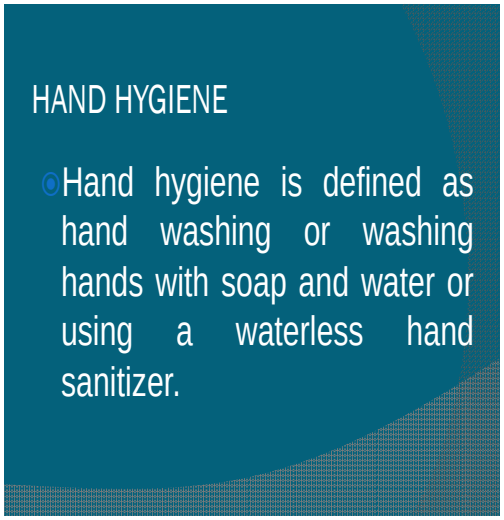
Sl.No	Time	Behavioral Objectives	Content	Teacher activity	Listener activity	AVI Aid
			Alcohol hand rub procedure • 3ml product is applied in cupped hand • Rub palms together. • Rub the back of hands with other hands, Interlace fingers and rub hands together. • Rub palm to palm with interlaced fingers and rub hands together. Rub the back of fingers to opposing palm with interlocked fingers. • . Rub each thumbs clasped in opposite hand using rotating movement. • Rub fingertips in a opposite palm in a circular motion. • Rub both wrists with opposite hand. Wait until evaporation of product and drying hands. • The process should take 15 to 30 sec			

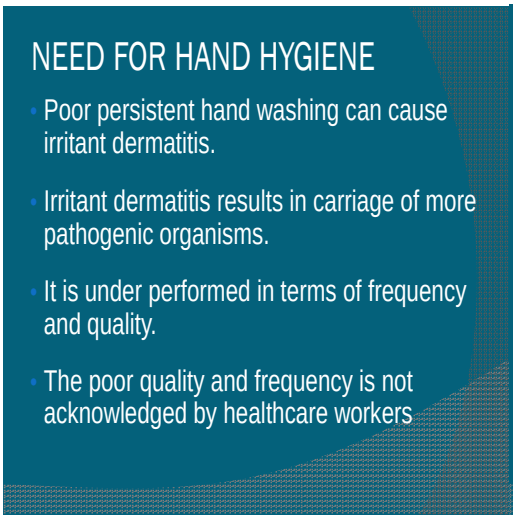
CONCLUSION

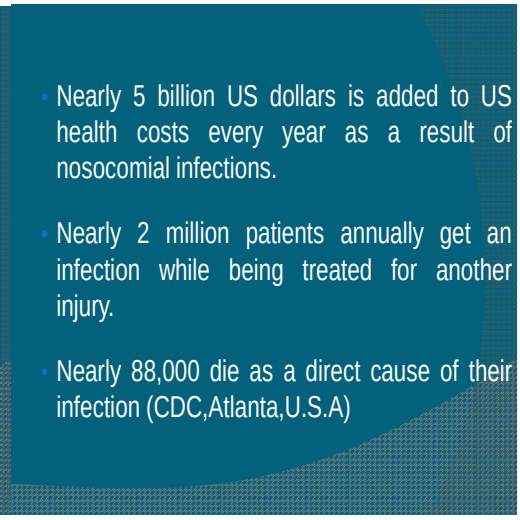
Despite advances in infection control and Hospital epidemiology, nurses' adherence to hand hygiene practice is low. The nurses have a responsibility to provide safety to the patients. Nurses put themselves as well as their patients at risk if they don't follow hand hygiene. Nurses routinely check patient identification bands before administration of medications; they know that dispensing the wrong drug to the patients could be disastrous .Similarly and equally, they should give importance to hand hygiene. If the proper hand hygiene becomes as habitual activity among nurses as patient identification checks, the hands of the nurses that heal would no longer dispense unintended harm. Hence, Hospital acquired infections might decline and nurses would incorporate another significant measure of personal safety into their profession.

Appendix 3


HAND HYGIENE
Malar vizhi A


HAND HYGIENE
Hand hygiene is defined as hand washing or washing hands with soap and water or using a waterless hand sanitizer.


NEED FOR HAND HYGIENE
Poor persistent hand washing can cause irritant dermatitis.
Irritant dermatitis results in carriage of more pathogenic organisms.
It is under performed in terms of frequency and quality.
The poor quality and frequency is not acknowledged by healthcare workers


Nearly 5 billion US dollars is added to US health costs every year as a result of nosocomial infections.
Nearly 2 million patients annually get an infection while being treated for another injury.
Nearly 88,000 die as a direct cause of their infection (CDC,Atlanta,U.S.A)

PRESENT STATUS OF HOSPITAL & PATIENT FLORA

- More resistant to antibiotics.
- Necessitates more toxic antibiotics.
- More expensive to treat.
- Causes greater anxiety among patients and Health care workers

- More vulnerable than ever.
- More severe consequences may develop as a result of hospital acquired infection.

RISK FOR NOSOCOMIAL INFECTIONS IN ICU

- ICU clients are critically ill
- More invasive devices such as IV or intra arterial lines are used in ICU
- More invasive procedures are performed in the ICUs than in other general care areas
- Often surgical procedures are performed in the ICU instead of operating room

- Over use of broad spectrum antibiotics
- The formation of resistant micro organisms that later cause infection
- The pace of activities in an ICU can often cause nurses and other health care provider to become less diligent with aseptic technique

CATEGORIES OF RISK FOR HOSPITAL ACQUIRED INFECTION

Low Risk

- Touching sterile goods
- Making clean bed
- Contact with notes, telephone, computer
- Medication round

Medium Risk

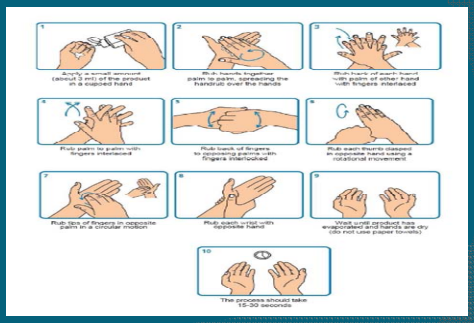
- Stripping a non-soiled bed
- Manipulating medical devices in immediate patient environment
- Helping to move patient in/out of bed
- Cleaning beds, furniture
- Observations (TPR & BP)
- Setting up & removing IVI, giving injections
- Wearing and removing gloves
- Bed bath

High Risk

- Dealing with bodily secretions (urine, faeces, blood) eg catheter bags
- Suctioning, tracheostomy care
- Wound dressings
- Phlebotomy, cannulation
- Between procedures on same patient

HAND WASHING TECHNIQUE

ALCOHOL HAND RUB TECHNIQUE



Appendix 4

Hand washing technique

Appendix 5

Alcohol hand rub technique