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Assessment of nurse knowledge and attitude about infection control in intensive care unit in elmek nimer university hospital

A thesis submitted In partial fulfillment for the requirement of the Master Degree in medical surgical nursing

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٢٠١٦

بسم الله الرحمن الرحيم

الآية

قال تعالى:-

﴿وَإِذَا مَرِضْتُ فَهُوَ يَشْفِينِ﴾

صدق الله العظيم

سورة الشعراء الآية (80)

Dedication

To my father and my mother who learned me the meaning of life.

To my sisters and brothers.

To my huspand and suns

Special dedication to all my friends.

Acknowledgement

Firstly greatest thanks to my god Allah and to a lot of thanks to who helped me in issuing out this research to my supervisor: Dr/Marium Alnageeb for her support, encouragement and guidance. A lot of thank to all my collages in Shendi University.

ملخص الدراسة

الصحه مهمه لاي مجتمع والعدوى تظل السبب في حدوث الامراض .العدوى التي تحدث عند المرضى المنومين بالمستشفيات تسمى العدوى المكتسبه من المستشفى والتي تحدث بعد 48 ساعه من دخول المستشفى . في السنوات الاخيره تم تنمية استراتيجيات متعدده للتحكم في العدوى مثل متابعة عملية غسل ,طرق عزل وبائي حديثه, طرق تنظيف للبيئة جديده .أجريت هذه الدراسة الوصفية في مستشفي الملك نمر الجامعي في الفترة من اغسطس الي ديسمبر 2016. شملت الدراسة كلالممرضين الزين عملوا بوحدة العناية المكثفة بمستشفى الملك نمر الجامعي وعددهم خمسون.تم جمع البيانات باستخدام استبيان وجدول مغلق الأسئلة بعد جمع البيانات تم تحليلها يدويا ومن ثم باستخدام برنامج التحليل الحزمي للبيانات (SPSS) بالحاسوب إصداره(22). أجريت هذه الدراسة بغرض تقييم معرفة وسلوك الممرضين عن التحكم في العدوي في وحدة العناية المكثفة .توصلت الدراسه الي أن اكثر من ثلثي مجموعة الدراسه (82%) يحمل شهادة بكالريوس , قرابة الثلثين(70%) لم يخضعوا لبرامج تدريبيه , اكثر من نصف مجموعة الدراسه لديهم معلومات جيده عن تعريف عملية التحكم في العدوى , مكوناتها , زمن حدوثها , كيفية الوقايه منها توصلت الدراسه ايضا الي أن اكثر من النصف دائما يقومون بعملية غسل الأيدي ويلبسون القفازات الطبيه بينما قرابة النصف دائما يقومون بتغيير انبوبة الشفط والأكسجين لأي مريض . توصلت الدرهسه ايضا أن أكثر من الربع دائما يقومون بالعنايه بالقسطره ورمي المخلفات في مكانها الصحيح . أوصت الدراسه على أهمية تعليم وتدريب العاملين بوحدة العنايه المكثفه عن وقاية المرضى من العدوى التي تكتسب من المستشفى لأن ذلك يعتبر جزء من برنامج التحكم في العدوى المتكامل ,أوصت الدراسه على ضرورة القيام بعملية غسل الأيدي ودواعيها لأنها تعتبر وسيلة الدفاع الأولى ضد العدوى . كما أوصت الدراسة على القيام بعملية نظافة الفم لأي مريض يحتاجها لمنع حدوث العدوى الطفيليه لأنها تسبب مشكله ايضا.أوصت الدراسه وشجعت استخدام ادوات الحمايه الشخصيه لتقليل نسبة انتقال العدوى ,وأوصت ايضا على القيام بعمل تقييم دوري من جانب رؤساء التمريض لتقييم التزام الممرضين باتباع عملية التحكم في العدوى.

Abstract

Background: Health is high priority for any society and infections remain leading cause of disease globally .infection which occur among patient in hospital after 48 hours called hospital acquired infection. Last few years have revealed numerous strategies for infection control such as monitoring hand hygiene ,up date on isolation prevention ,new method on environment cleaning . **Study design:**Descriptive, hospital-based study, was conducted in Shendi city in ElMek Nimer University hospital from August – December 2016, all nurses work in ICU medicine and ICU surgery. 50 nurse were enrolled , standard closed ended questioner and check list was been used to data collection. The collected data was analyzed by using Computer software SPSS program version (21).

Objectives: To assess nurse knowledge and attitude about infection control in ICU

Result: The study showed that: more than tow third (82%)of study group had bachelor ,near tow third(70%) had no previous training program ,more than half had good knowledge about definition of infection control and it is component ,time of occurrence and prevention .the study also showed more than half of study group always done hand washing with it is moment and wore gloves, near the half always changed suction and oxygen set for any patient, more than quarter always cared catheter and dispose waste in right place.

Recommendation: The study recommended that Important of training and education of ICU staff about health care associated infection prevention ,because it is apart of comprehensive infection control programThestudy

recommended that Hand hygiene is necessary ,folowing five moment of hand hygiene, it confider first defense mechanism against infection .The study recommended to perform periodic assessment by head of nurses to assess staff compliance to standard precaution and other infection control measure.

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Chapter One

Introduction

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1.1 **Introduction**

-Health is high priority for any society and infections remain a leading cause of disease globally .those infection which occur among patient in hospital and become manifest only after 48 hours of stay are called nosocomial infection or hospital acquired infection . It lead to significant morbidity ,mortality and economic burden beyond those expected from patients under line disease alone .In the western world the health care associated infection rate 5 to 10 infection per hundred patient admission .In the developing world the rate can be 25 percent or more. The distribution of infections by anatomic site in the developed world: urinary tract thirty five percent ,post operative wound twenty five percent, blood stream ten percent, pneumonia ten percent and other twenty percent.[(1)]

Infections in critical care unit are high, and of serious hospital problems. Infections acquired during the hospital stay are generally called nosocomial infections, initially known as infections arising after 48 h of hospital admission. National Nosocomial Infections Surveillance system defines a nosocomial infection as a localized or systemic condition that results from adverse reaction to the presence of an infectious agent or its toxin that was not present or incubating at the time of admission to the hospital. These infections are opportunistic, and microorganisms of low virulence can also cause disease in hospital patients whose immune mechanisms are impaired. Hence, antimicrobial resistance increases in such cases making increase in morbidity and mortality. Nosocomial infections are typically exogenous, the source being any part of the hospital ecosystem, including people, objects, food, water, and air in the hospital.[(2)]

the incidence of nosocomial infections in the intensive care unit (ICU) is about 2 to 5 times higher than in the general in-patient hospital population. The increased morbidity and mortality associated with nosocomial infections in the ICU is a matter of serious concern today. Serious medicolegal issues also arise in this context, since the patient or their families sometimes blame the hospital staff for the infection and demand compensation. It has been reported that in hospitals with an effective program for nosocomial infection surveillance, infection rates can be reduced by approximately one-third[3] . Infection risk is significantly increased as patient care equipment becomes morecomplex and as more devices that disrupt naturally protective_anatomic barriers are used. attention to hand hygiene, by ensuring careful administration of prescribed antibiotics, and by following procedures to reduce the risks associated with patient care devices.[4]

There are many things that can be done to prevent the spread of nosocomial diseases in the ICU, from large scale renovations to hospitals so ICU patients can have their own rooms to small scale practices like hand washing. If health care providers get to know their coworkers, then they can further reduce the chances of spreading disease .[5]

1.2 Justification

The field of infection control has grown in importance over the last thirty years. The science of infection control like others, is in constant evolution .An intensive care unit is one of the hospital wards critical in the treatment of many serious disease , which need particular cares. Despite having a prominent role in the care of patients with infection, intensive care unit infection cause some complications and death ,and increases the cost imposed on patient and society.

Patient in intensive care unit have multi organ failure and need more attention and specific care. Staff nurses play an important role in risk reduction by paying careful a Nurses specializing in infection control are responsible for agency wide policy development and program direction.

1.3 Objectives

-General objective:

*To assess nurse knowledge and attitude about infection control in intensive care unit.

-Specific objective:

*To assess nurse knowledge about infection control measures .

*To identify most common types of hospital associated infection.

*To determine patient at risk for nosocomial infection.

* To assess nurses attitude regarding standard precaution element

2. Literature review

Nosocomial infection definition:

-an infection that is not present or incubating when the patient is admitted to hospital or other care facility .[3]an infection acquired in a patient in hospital or other health care facility whom it was not present or incubating at a time of admission or the residual of an infection acquired during a previous admission.[6]infection acquired during the hospital stay, initially known as infections arising after forty eight hours of hospital admission. [2]Nosocomial infection refer to any systemic or localized condition that result from the reaction by an infections agent or toxin.[7]

Type of nosocomial infection:

1-nosocomial fever: a source in one third of all medical in patient and more common in the ICU .ICU patient have several underling medical or surgical condition .There fore fever in ICU patient must be thoroughly and promptly evaluated to discriminate infections or non infection etiology .cause of fever in ICU :surgical site infection ,urinary catheter ,intravenous line associated infections, bacteriuria, Nosocomial pneumonia, drug fever, Nosocomial sinusitis, intra abdominal ,Post operative fever infection , Neuro surgical cause, wound infection and urinary tract infection .

2-Device related infection: is an infection in patient with device (central line-ventilator-on indwelling catheter).

3-Diarrhea :sinus infection –intra abdominal infection –urosepsis. Catheter related blood stream infection .

4-Ventilator associated pneumonia . [6]

*Most prevalent nosocomial infection among patients in ICU are urinary tract infection ,pneumonia, blood stream infection ,skin and soft tissue infection ,gastroenteritis ,hepatitis and central nervous system infection like meningitis .[2]

*Classification of ICU infection based on pathogenesis of infection and the criteria for carrier status were offered .There types of infection in ICU .including primary and secondary endogenous and exogenous infections are defined by carrier status. Only secondary endogenous and exogenous infection is real infection acquired in ICU. [7]

Risk factor for nosocomial infection:-

-Risk factors for nosocomial infections include: diabetes mellitus, intubation, persistent sounding, surgical drains, poor health status ,lack of using gloves ,irregular and inappropriate debridement and wound bandage .[2]

-There are patient ,therapy and environment related risk.

factors for the development of nosocomial infection:

Age more than 70 years ,shock , major trauma ,acute renal failure , coma ,pre antibiotic , mechanical ventilation

Drugs affecting the immune system “steroids-chemo therapy”-prolonged ICU stay[8].

Factor influencing increased infections in ICU:

Hand washing facilities, Patient close together or sharing rooms, Understaffing, Preparation of IVs on the unit, Lack of isolation facilities, No separation of clean and dirty areas, Excessive antibiotic use, Inadequate decontamination of items & equipments, Inadequate cleaning of environment.[9]

Chain of infection:.

The chain of infection describes how infection is transmitted from one living thing to another. Transmission of infection can occur when the elements forming the "Chain of Infection" are present .These six elements are composed of:

1. **Infectious agent** e.g., bacteria, virus, : This can be **endogenous** (self-infection), which occurs when organisms which are harmless in one site, cause infection when transferred to another e.g., *E.coli* or **exogenous** (cross infection), which occurs when organisms are transferred from another source e.g. doctor, nurse, other patient or the environment.

2. **Reservoir:** A reservoir is a place where an infectious agent lives and grows (e.g., large intestine, blood, mouth).

3. **Portal of exit:** A portal of exit is any body opening that allows the infectious agent to leave (e.g. mouth, nose, rectum, and breaks in the skin).

4. **Means of transmission:** The means of transmission is how the infectious agent travels from the infected person to another person e.g., air, contact (*direct* e.g., hands of healthcare worker and *indirect* e.g., equipment).

5. **Portal of entry:** The portal of entry is any body opening that allows the infectious agent to enter (e.g. nose, mouth, eyes, a break in the skin)

6. **A susceptible host:** A susceptible host is a non infected person who could get infected.[(10)]

Specific organism with nosocomial infection potential:

Clostridium difficile

Clostridium difficile is a spore-forming bacterium with significant nosocomial potential. Infection is usually preceded by antibiotics that disrupt normal intestinal flora and allow the antibiotic-resistant.C. difficile spores to proliferate

within the intestine. The organism causes pathology by releasing toxins into the lumen of the bowel.

Methicillin-resistant S. aureus (MRSA) is a common nosocomial infection in hospitals and extended care facilities. MRSA refers to S. aureus organisms that are resistant to methicillin or its comparable pharmaceutical agents, oxacillin and nafcillin. Because of the pathogenicity of S. aureus, there has been concern about antibiotic resistance since the discovery of penicillin in the 1940s, the prevalence of the organism was originally linked epidemiologically to the IV/injecting drug use community.

Vancomycin-resistant enterococcus

Enterococcus is a gram-positive bacterium that is part of the normal flora of the gastrointestinal tract. It can produce significant disease when allowed to infect blood, wounds, or urine.[4]

Definition of infection control :

Refers to policies and procedure used to minimize the risk of spreading infection , especially in hospitals and human or animal health care facilities .[2]

General measure of infection control:-

1-Isolation :

Assess the need for isolation ,screen all intensive care unite patients for the following :Neutropenia and immune logical disorder ,diarrhea ,skin rashes ,known communicable disease ,known carries of an epidemic strain of bacterium.

There are two type of isolation in the ICU:-

a-Protective isolation for neutropenic or other immune com promised patient to reduce the change of acquiring opportunistic infections.

b-source isolation of infected patients to minimize potential transmission to other patient or staff.[8]isolation precautions are guide lines created to prevent transmission of micro organism in hospital .The control practices advisory committee, along with control disease center implement two tiers of isolation precaution .The first tiers called standard precaution, was designed for the care of all patient in the hospital and primary strategy for preventing nosocomial infection .The second tire called transmission Based precautions ,was designed for care of patient ,with known or suspected infections spread by air borne , droplet ,or contact routes.[4]isolation and barrier precaution aim to reduce or eliminate direct or indirect patient to patient transmission of health care associated infection . Beside patient to patient transmission, health care associated infection can be endogenous (patient is source of infection)or acquired from environmental source like contaminated water supplies ,medical equipment ,These infection can not prevented by isolation precaution.[1]

2- **Standard precaution:-**

The tent of standard precautions are all patients are colonized or infected with micro organisms ,whether or not there are signs or symptoms ,and that a uniform level of caution should be used in care of all patients .The element of standard precaution include :

Hand hygiene ,use of gloves and other barriers (mask ,eye protection ,face shield ,gown) ,handling of patient care equipment and linen ,environmental control ,prevention of injury from sharps devices and patient placement.[4] Standard precaution are designed to reduce the risk of transmission of micro organism from both recognized and un recognized source of infection in hospital .standard precautions applies to all patients regardless of their diagnosis.

Standard precaution element :-

a-Hand hygiene :must be practiced promptly after touching blood ,body fluids ,secretion or excretions whether or not gloves were worn ,after gloves are removed and between patient contacts. Finally hand hygiene must be practice when task on procedures on the same patient involve different body sites in order to prevent cross contamination between body site. [11]hand hygiene is a general term that includes the appropriate use of hand washing ,antiseptic hand washing and antiseptic hand rubbing hand washing refers to the action of washing with plain soap and water ,antiseptic hand washing refer to washing hand with water and soap or other detergents containing an antiseptic agent. Antiseptic hand rubbing refer to the application of an antiseptic hand rub (usually an alcohol based formulation)to the hand to reduce or inhibit the growth of micro organism .The who(my five moment for hand hygiene is based on a conceptual model of microbial trans mission and can be used for teaching ,monitoring and reporting hand hygiene compliance .

Indication of hand hygiene :wash hand with soap and water when hands are visibly dirty or after using toilet ,if exposure to potential spore forming pathogen is strongly suspect or proven .

Five moment for hand washing:-

-Before touching patient

-Before a septic clean procedure

-After body fluid exposure

-After touching a patient

-After touching patient surrounding [1]

b-Personnel protective equipment ;the second element of standard precaution include: -

-Gloves :must be worn when touching ,blood ,body fluid ,excretions ,secretions and contaminated items and when perform veni puncture.

-Mask ,eye protection and face shield :must be worn during procedure or patient care activities that are expected to splashes or sprays of blood ,body fluid ,secretion (suction ,irrigating . a wound , performing laboratory test.

-gown :must be worn to protect skin and to prevent soiling of clothing during procedures.[11]

c-patient care equipment:-Used patient care equipment soiled with blood ,body fluids and secretion should be handled carefully to prevent Skin and mucous membrane exposure ,contamination of clothing and transfer of organism to health care workers ,other patient or environment .ensure that reusable equipment is not used for care of another patient until it has been cleaned and sterile appropriately .ensure that single use items and sharps are discard properly .[8]

d-All reusable medical items must be thoroughly decontaminated before disinfection or sterilization, if not adequately decontaminated , disinfection or sterilization is not effective .All package and wrapped sterile items must be transported and stored while maintaining the integrity of packs to prevent contamination non-critical Medical equipment (physiologic monitor ventilators ,infusion pumps) shall be cleaned at least daily with a low or intermediate level instrument grade least disinfection and allowed to air dry .Respiratory equipment use only sterile water \fluid for respiratory care (suctioning ,filling of humidifiers and nebulisers). Change the oxygen delivery system (tubing ,nasal prongs or mask) that is in use on one patient when it mal function or becomes visibly contaminated or between uses indifferent patient .clean ,disinfect , rinse with sterile water and dry nebulisers between treatment on the same patient and

use only sterile fluid for nebulization .change the entire length of suction – collection tubing and canisters between uses on different patient

e-linen:-place contaminated linen directly .in to a laundry bag in the isolation room area with minimal manipulation or agitation to avoid contamination of air ,surfaces and person .

f-waste management :-clinical waste include :

Discarded sharps ,clinical waste (none sharp) domestic waste ,chemical waste ,pharmaceutical waste , cyto toxic waste .

g-Save injection practices , needle and other sharps management ,respiratory hygiene and cough etiquette also it is requirement of standard precaution .[11]

Transmission Based Precaution :-

In addition to standard precautions ,the following should be observed in those patient known are suspected to have air borne ,contact or droplet infection :-

Airborne precautions

Isolate patient , respiratory protection must be employed ,use the disposable mask which fits tightly around the nose and mouth to protect against both large and small droplet

Contact precaution:

Infection spread by direct or in direct contact with infected person, isolation is required, non critical patient care equipment should preferably be of single use if available or clean and disinfected them adequately before using to another patient , limit trans port of the patient .

Droplet precaution:

Micro organism also can transmitted by droplets during coughing ,sneezing and talking. Isolation required , respiratory protection must be employed , limit trans port of patient.[8]

Recommended Measures for Patients that Require Transmission Based Precautions

practice staff that require it:

Once the patient leaves, clean and decontaminate equipment and the Patient placement. If possible, symptomatic patients who present a risk of droplet transmission e.g., influenza, or airborne transmission e.g., TB should be placed in a dedicated waiting area, away from other patients. If a dedicated waiting area is not available then these patients should be placed at least one meter away from other patients if possible.

Consider provision of a surgical mask for patients requiring droplet and airborne precautions to wear while in the practice.

Have appropriate PPE readily available for any e environment as appropriate (refer to decontamination guideline applicable[12]

Prevention of health care associated infection:

Prevent urinary tract infection:

To prevent urinary tract infection hand hygiene should be done immediately before and after manipulation of catheter site or apparatus, use aseptic technique and sterile equipment for catheter insertion, periurethral cleaning, and use lubricant for insertion and properly secured after insertion.

Close sterile drainage should be maintained; specimen collection should be aspirate by sterile needle and syringe or obtained aseptically from the drainage bag.un obstructed flow should be maintained and check flow several time a day; catheter should be change maximum duration for silicone-coated latex catheters14days.

Prevent nosocomial respiratory infection:-

Prevent person to person transmission of bacteria by wearing gloves when in contact with mucus membrane, handling respiratory secretion or object contaminated, change gloves between contact with different patient ,wear mask and gown when anticipate soiling of respiratory secretion from the patient(intubation, tracheal suction, tracheostomy, bronchoscope).

precaution to prevent aspiration :remove devices such as endotracheal ,trachestomy, oro/nasogastric tube from patients as soon as they are not indicted, perform orotracheal rather than nasotracheal intubation unless contraindicated, elevate the head of the bed 30-45 degree of patient on mechanical ventilation or at high risk of aspiration, appropriate placement of feeding tube, asses the patient feeding tolerance.

prevent health care associated pneumonia:containing education should be provided to all health care workers on infection control principles in the prevention of transmission of health care associated pneumonia and ventilation associated pneumonia .prevent contamination of respiratory care equipment, avoid over sedation, avoid continuous use of paralytic ,provide oral care, elevation of head of bed .

prevention of intravascular catheter related infection :

patients with abrupt onset of signs and symptoms of sepsis without any other identifiable source should prompt suspicion of an Iv catheter associated infection.to prevent intravascular catheter related infection perform hand hygiene combined with aseptic techniques before catheter insertion and during catheter care ,maximum barrier precaution, chlorhexidine skin preparation, optimal site selection, care of administration set, care of infuasate, Iv medication and admixture .[(11)]

3-Decontamination of medical equipment

Decontamination of reusable invasive medical devices (RIMDs)

Decontamination is the combination of processes (including cleaning, disinfection and sterilisation) used to render Reusable Invasive Medical Devices (RIMDs) safe for handling by staff and for use on patients.

Cleaning is the process that physically removes soiling, including large numbers of microorganisms and the organic material on which they grow. This is usually carried out using neutral detergent and warm water. Detergent wipes may be used provided they have not dried out.

Disinfection describes a process that eliminates many or all-pathogenic microorganisms from inanimate objects, with the exception of bacterial spores, e.g. disinfection of environmental surface with a sodium hypochlorite solution. The use of disinfectant wipes is not advised.

Sterilisation refers to a physical or chemical process that completely kills or destroys all forms of viable microorganisms from an object, including spores. This is usually carried out in an autoclave. [(10)]

All healthcare staff have a duty to act on and report at the earliest opportunity conditions or incidents that may be deemed infectious to others, eg communicable/notifiable diseases and resistant organisms (using the Datix on-line Untoward Event Reporting form accessible to all staff on the Trust Intranet).

 all healthcare staff are required to adhere to the policies, guidelines and procedures pertaining to the prevention and control of healthcare associated infection which provide a framework for safe and best practice.[(13)]

3. Material and Methodology

3.1 Study design:

This study was descriptive, cross sectional, hospital based research, done in period extended from August to December 2016 to assess nurses knowledge and attitude about infection control in ICU unit.

3.2 Study area:

The study was done in Sudan Shendi town which is located 172 Km North to Khartoum city, it is the southern part of the River Nile state, lies in the east of the River Nile and covering area of 30Km square.

Most of the people in Shendi working in agriculture, simple in industrial works, employers, and trading.The town considered as center of Galieen tribe and some other tribes.There are different centers for general services, also there Shendi university with its different faculties. Shendi has two big hospitals, the teaching hospital, and Elmek Nimer university hospital.

3.3 Study setting:

Elmek Nimer university hospital was established in July 2002.and consist of the following parts: theater, male/female surgery wards, male/female medicine wards, obs /gynecologic wards, pediatrics wards, laboratory, x-ray, u/s, renal part, radiation and chemotherapy, dialysis, endoscope, ICU and CCU. Thereare130 nurses in the hospital.ICU surgery/ICU medicine was specific setting for the study, the ICU surgery unit composed of (4) beds ,the total number of staff (4) nurses (1) of them in morning shift while (3)nurses were distributed to three groups in afternoon and night shift .

ICU medicine unit composed of(9)beds ,and total number of staff(13) nurses(4)of them in morning shift ,while (9)nurses were distributed to three groups to after noon night shift each group composed of(3) nurses.

3.4 Study population:

all nurses' work in ICU medicine, ICU surgery in Elmek Nimer university hospital during period of study.

3.5 Sampling technique:

All nurses whom worked in 1CU medicine, ICU surgery were enrolled in the study.

3.6 Sample size:

(50) nurses were participated. (convenient sample)

3.7 Data collection tool:

The data was collected by questionnaire, check list designed by the researcher to fulfill the purpose of knowledge and attitude assessment of the study group based on literature review

3.8 Scoring system: Questionnaire:

Scoring system was established by researcher which the data was distributed three categories to measure the level of nurses knowledge about infection control, if the nurse respond to (3, 4) choice it consider good knowledge, (2) choice consider fair knowledge, (1, 0) choice consider poor knowledge.

3.10 Data collection technique:

The data was collected within one week during morning and afternoon and night shift. Every questionnaire takes 3-5 minutes and the attitude check lists vary between 10 – 15 minutes.

3.12 Data analysis:

The data was analyzed by statistical package for social sciences (SPSS version21) and presented in forms of tables and figures.

3.13 Ethical consideration:

The study was approved by ethical committee of research in faculty of post graduate and scientific research, before conduction the study. Verbal Permission have been taken from original director of the hospital and then head nursing. The researcher was explained the purpose of the study to the nurse's participant and has assured them that data collected from questionnaire and check lists will remain confidential and it is not allowed for any person to identify it.

4. Results

Table No {1}: Distribution of study population according to their Education level:

Education level	Frequency	Percent
Diploma	1	2%
Bachelor	41	82%
Master	8	16%
Total	50	100%

Table (1) showed that, more than tow third (82%) of study group had bachelor, 16% of them had master degree and 2%had diploma

Table No {2}: Distribution of study population according to their years of Experience:

Experience level	Frequency	Percent
Less than 2 years	2	4%
2 -5 years	29	58%
More than 5 years	19	38%
Total	50	100%

Table(2) showed that ,more than half(58%) of the study group had experience 2-5 years , while more than one third 38% of them had experience more than 5 years and 4% less than 2years..

Table No {3}: Distribution of study population according to their previous training program:

Previous training program	Frequency	Percent
Yes	15	30%
No	35	70%
Total	50	100%

Table (3) showed that near tow third(70%) of study group had no previous training program, while 30% of them had previous training program.

Part 2:

Table No {4}: Distribution of study population according to their knowledge about definition of infection control:

Definition of infection control	Frequency	Percent
Polices and procedure use to minimize of spreading infection	37	74%
Prevent disease occurrence	7	14%
Broken of infection process	6	12%
Total	50	100%

Table (4) showed that, more than tow third (74%) of study group defined infection control as policies and procedure use to minimize spreading infection, while 14% defined infection control as prevent disease occurrence and 12%defined infection control as broken infection process.

Table No {5}: Distribution of study population according to their knowledge to Component of infection control

Component of infection control	Frequency	Percent
Good knowledge	39	78%
Fair knowledge	10	20%
Poor knowledge	1	2%
Total	50	100%

Table(5) showed that more than three quarter(78%) of study group had good knowledge about infection control component ,while less than quarter 20% had fair knowledge and 2% had poor knowledge .

Table No {6}: Distribution of study population according to their knowledge about component of standard precaution

Component of standard precaution	Frequency	Percent
Good knowledge	34	68%
Fair knowledge	6	12%
Poor knowledge	10	20%
Total	50	100%

Table (6) showed that, more than half(68%) of study group had good knowledge about component of standard precaution ,while less than quarter 20% had poor knowledge and 12% had fair knowledge.

Table No {7}: Distribution of study population according to their knowledge about benefit of using personal protective equipment in ICU unit

Benefit of using personal protective equipment in ICU	Frequency	Percent
Protect your self	3	6%
Protect patient	6	12%
Both	41	82%
Total	50	100%

Table (7) showed that more than three quarter (82%) of study group used personal protective equipment to protect them and patient , while 12% used it to protect patient and 6% used it to protect them self .

Table No {8}: Distribution of study population according to their knowledge about hand washing indication in ICU:

hand washing indication in ICU	Frequency	Percent
Good knowledge	31	62%
Fair knowledge	10	20%
Poor knowledge	9	18%
Total	50	100%

Table (8) showed that ,more than half of study group(62%) had good knowledge about hand washing indication ,while less than quarter 20% had fair knowledge and 18% had poor knowledge.

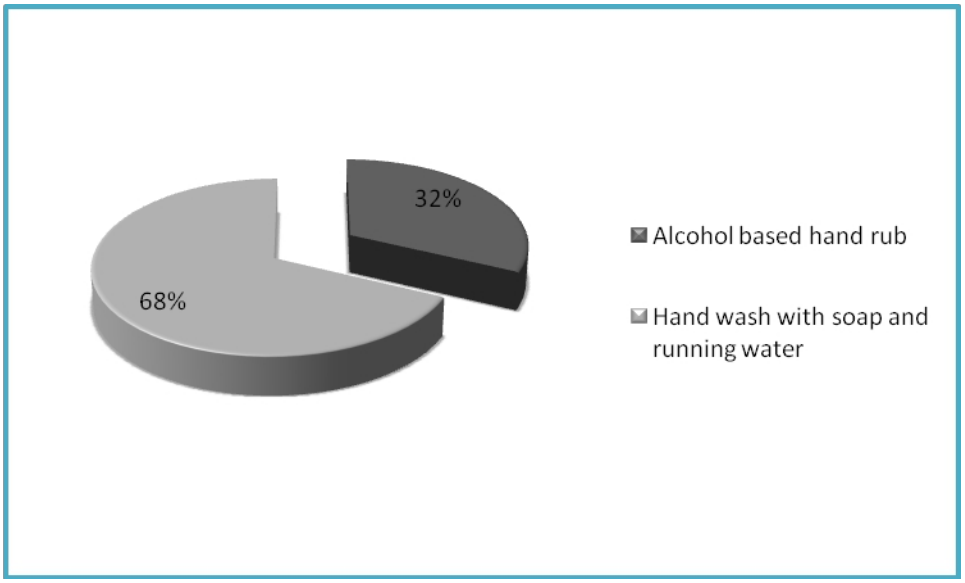

Figure No {1}: Distribution of study population according to their knowledge about hand hygiene method used in ICU:

Figure (1) showed that more than half (68%) of study group washed hand with soap and running water and more than quarter (32%) used alcohol based hand rub.

Table No {9}: Distribution of study population according to their knowledge about chain of infection:

Chain of infection	Frequency	Percent
Good knowledge	26	52%
Fair knowledge	0	0%
Poor knowledge	24	48%
Total	50	100%

Table (9) showed that more than half (52%) 0f study group had good knowledge and less than half(48%) had poor knowledge.

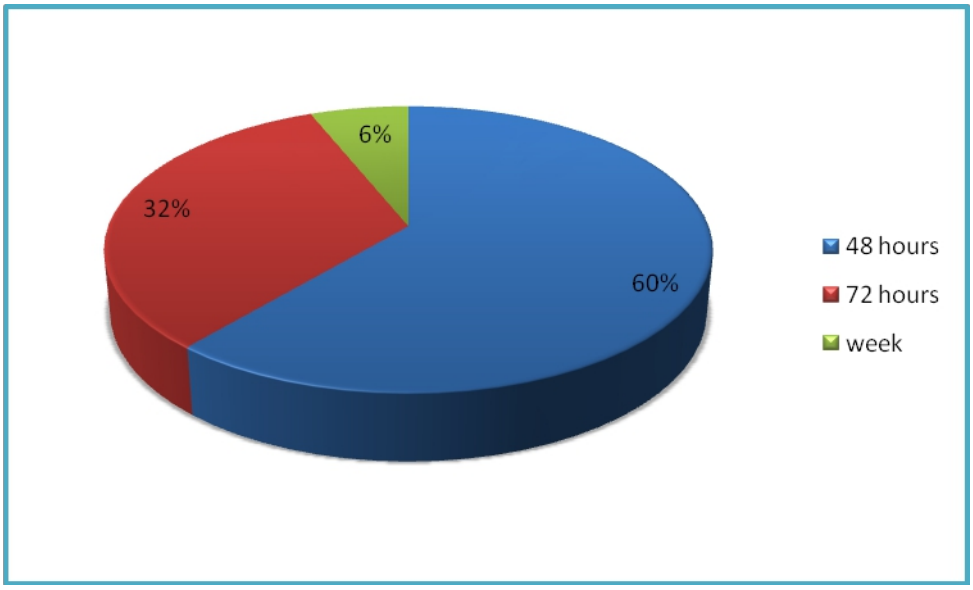

Figure No {2}: Distribution of study population according to their knowledge about time of nosocomial infection occurrence in patient in ICU:

Figure(2) showed that more than half(60%) of study group said nosocomial occur after 48 hours , more than quarter (32%) said after 72hours and 3% said after week

Table No {10}: Distribution of study population according to their knowledge about the most common type of nosocomial infection:

Most common type of nosocomial infection in ICU	Frequency	Percent
Goode knowledge	2	4%
Fair knowledge	24	48%
Poor knowledge	24	48%
Total	50	100%

Table (10) showed that, near the half(48%) of study group had fair knowledge about most common type of nosocomial infection ,while near the half (48%) had poor knowledge and 4% had good knowledge.

Table No {11}: Distribution of study population according to their knowledge about risk factor for nosocomial infection in ICU :

Risk factor for nosocomial infection	Frequency	Percent
Good knowledge	17	34%
Fair knowledge	20	40%
Poor knowledge	13	26%
Total	50	100%

Table (11) illustrate that more than quarter (34%) of study group had good knowledge about risk factor for nosocomial infection, while less than half(40%) had fair knowledge and more than quarter(26%) had poor knowledge.

Table No {12}: Distribution of study population according to their knowledge about prevention of infection in ICU:

Prevention the infection in ICU	Frequency	Percent
Good knowledge	23	46%
Fair knowledge	23	46%
Poor knowledge	4	8%
Total	50	100%

Table (12) showed that near the half (46%) of study group had good knowledge , while near the half (46%) had fair knowledge and 8% had poor knowledge about prevention infection in ICU.

Table No {13}: description of study group according to their attitude of infection control measure , (hand washing):

Items	Attitude scaling								Total	
	Never done		Some times		Frequently		Always			
	F	P	F	P	F	P	F	P	F	P
Hand washing before clean/aseptic procedure	4	8%	14	28%	6	12%	26	52%	50	100%
Hand washing before touch patient	7	14%	14	28%	6	12%	23	46%	50	100%
Hand washing after touch patient	5	10%	7	14%	5	10%	33	66%	50	100%
Hand washing after touch patient surrounding	5	10%	11	22%	6	12%	28	56%	50	100%

Table (13) showed that : more than half (52%) of study group always washed hand before clean/aseptic procedure, more than quarter (28%) some times,12% frequently and 8% never done . the table also showed near the half (46%) of study group washed hands before touch patient , more than quarter (28%) some times , while 14%never done and 12% done that frequently. the table also

showed more than half (66%) of study group always washed hands after touch patient ,14%some times,10% frequently,10% never done . The same table showed more than half (56%) of study group always washed hand after touch patient surrounding, less than quarter 22% sometimes ,12% frequently and 10% never done that.

F mean frequency

P mean percentage

Table No{14}: Distribution of study population according to their attitude of using personnel protective equipment :

Items	Attitude scaling								Total	
	Never done		Sometimes		frequently		Always			
	F	P	F	P	F	P	F	P	F	P
Wearing gloves during any procedure	2	4%	8	16%	3	6%	37	74%	50	100%
Face mask	24	48%	10	20%	8	16%	8	16%	50	100%
Gown	28	56%	13	26%	3	6%	6	12%	50	1oo%
Eye protection	36	72%	0	0%	7	14%	7	14%	50	100%

Table (14) showed that: about two third (74%) of study group always wore gloves during any procedure,16%always wore face mask,12% always wore gown and 14% always wore eye protection. The table also showed 6% frequently wore gloves during any procedure, 16% frequently wore face mask ,

6% frequently wore gown and 14% frequently wore eye protection. The table also showed more than quarter (26%) of study group sometimes wore gown , less than quarter 20%sometimes wore face mask , and 16% sometimes wore gloves before any procedure. The same table showed near tow third (72%) of study group never wear eye protection, more than half (56%)never wear gown, near the half (48%) never wear face mask and 4% never wear gloves during procedure.

Table No{15}: distribution of study population according to their attitude of donning oral hygiene:

Items	Attitude scaling								Total	
	Never done		Sometimes		frequently		Always			
	F	P	F	P	F	P	F	P	F	P
Dailey at morning	14	28%	17	34%	9	18%	10	20%	50	1OO%
After suction	5	10%	22	44%	8	16%	15	30%	50	100%

Table (15) showed that more than quarter (28%) of study group never done oral hygiene daily at morning, more than quarter (34%) some times, 18% frequently and less than quarter 20% always done that. The same table showed less than half(44 %) of study group some times done oral hygiene after suction, more than quarter (30%) always, 16% frequently and 10% never done that.

Table No {16}: distribution of study population according to their attitude regarding (catheter care , dispose of waste in right place , cleaning and disinfection , patient care equipment cleaning) :

Items	Attitude scaling								Total	
	Never done		sometimes		frequently		Always			
	F	P	F	P	F	P	F	P	F	P
Catheter care	4	8%	16	32%	14	28%	16	32%	50	100%
Dispose of waste in right place	0	0%	18	36%	10	20%	22	44%	50	100%
Cleaning and disinfection	8	16%	8	16%	11	22%	23	46%	50	100%
Patient care equipment cleaning	10	20%	9	18%	13	26%	18	36%	50	100%

Table(16) showed near the half(46%)of study group always cleaned disinfected before invasive procedure , less than half of them(44%) always disposed waste in right place , more than quarter (36%) always cleaned patient care equipment and more than quarter(32%) always cared catheter. The table also showed more than quarter (28%) of study group frequently cared catheter, more than quarter (26%) frequently cleaned patient care equipment , less than quarter 22% frequently cleaned and disinfected before invasive procedure , 20% frequently disposed waste in right place , The same table showed more than quarter (36%) some times disposed waste in right place , more than quarter (32%) sometimes cared catheter 18% sometimes cleaned patient care equipment ,16% sometimes cleaned and disinfected before invasive procedure ,. The table also showed less

than quarter (20%) never cleaned patient care equipment, 16% never cleaned and disinfected before invasive procedure, and never cared the catheter.

Table no{17}: distribution of study population according to their attitude about(elevate head of bed and check micro aspiration , change suction tube every suction , use sterile solution to flush suction tube and oxygen delivery system change for any patient) :

Items	Attitude scaling								Total	
	Never done		sometimes		frequently		Always			
	F	P	F	P	F	P	F	P	F	P
Elevate head of bed and check micro aspiration	4	8%	15	30%	8	16%	23	46%	50	1oo%
Change suction tube each suction	7	14%	14	28%	5	10%	24	48%	50	100%
Use sterile solution to flush suction tube	5	1o%	15	30%	8	16%	22	44%	50	100%
Oxygen delivery system change for any patient	5	10%	7	14%	7	14%	31	62%	50	100%

Table(17) showed that: more than half(62%) of study group always changed oxygen set ,also near the half (48%) always change suction tube (46%) always elevated head of bed and check micro aspiration , less than half of them(44%) always used sterile solution to flush suction tube. The table showed 16%

frequently elevated head of bed and checked micro aspiration , 16% frequently used sterile solution to flush suction tube , 14% frequently changed oxygen delivery system for any patient and 10% frequently changed suction tube each suction .the table also showed more than quarter (30%) some times elevated head of bed checked micro aspiration and used sterile solution to flush suction tube ,also more than quarter (28%) sometimes change suction tube each suction, 14% sometimes changed oxygen set for each patient. The table also showed 14% of study group never changed suction tube for any patient, 10% never changed oxygen set for any patient and never used sterile solution to flush suction tube, 8%never elevated head of bed

5.1 Discussion

Infection prevention and control is core part of an effective risk management program , aiming to improve the quality of patient care and the occupational health of staff .in addition to the clinical need to prevent the spread of health care associated infection , there are legal requirement to protect patient , staff and visitor from harm .This is descriptive study was conducted to assess nurse knowledge and attitude regarding infection control in ICU elmek Nimer university hospital at period extended from (august to december 2016) .

The study reflect that near tow third (74%) of study group had good knowledge about infection control definition ,also more than tow third (78%) had good knowledge about component of infection control and more than half (68%) had good knowledge about component of standard precaution ,this result corresponding with their experience because more than half (58%) of study group their years of experience (2-5)years , and most of them (82%) their level of education was bachelor, while 16% had master degree.

The study clarified that most of study group (82%) had good knowledge regarding benefit of using personnel protective equipment and more than half (68%)of nurse participated in this study had good knowledge about hand washing indication .The present study finding that more than half (68%) of study group used soap and running water to wash hand and more than quarter (30%) used alcohol based hand rub, this agree with literature (the appropriate use of hand washing ,antiseptic hand washing and antiseptic hand rubbing) [(11)]

The study reflect that more than half (52%) of study group had good knowledge about chain of infection this result help to reduce infection in the unit. The study showed about that more than half (60%) had good knowledge about time of nosocomial infection occurrence ,and near the half (48%) of them had fair

knowledge about the most common type of nosocomial infection in ICU, while more than one third (40%) of them had fair knowledge about risk factor for nosocomial infection in ICU .the study found that near the half (46%) of study group had good knowledge about prevention infection in ICU unit .The present study finding reflect that more than half (52%) of study group always washed hand before clean /aseptic procedure , while near the half (46%) always washed hand before touch patient , more than half (66%) of them always washed hand after touch patient , also more than half(56%) always washed hand after touch patient surrounding , this study also showed about tow third (74%) of study group always wore gloves during any procedure all those attitude help in reduce infection transmission.

The study clarified that near the half (48%) of study group never wear face mask , while more than half (56%) never wear gown and more than quarter(42%) never use eye protection during procedure that splash fluid, those result indicator for the need of improving attitude of the study group about using personnel protective equipment and monitoring their compliance .The study found that more than quarter (34%)of study group some times done oral hygiene for patient daily at morning, while near the half (44%) sometimes done oral hygiene after suction, the study also showed more than quarter (32%) done catheter care ,also more than quarter(44%) always disposed waste in right place , while near the half (46%) always cleaned and disinfected before invasive procedure , and more than quarter (36%)always cleaned patient care equipment , those result related to inadequate training program because near tow third (70%) of study group had no previous training program .

The present study also found near the half (46%) of study group always elevated head of bed and checked micro aspiration this agree with previous study

(Elevation of the head of the bed checks micro aspirations in patients and 66% of the ICU staff strongly believed it.67% said that they elevate the head of bed)[14] , also near the half (48%) always changed suction tube each suction , while more than quarter (44%) always used sterile solution to flush suction tube , and more than half (62%)always changed flush suction tube , and more than half (62%)always changed oxygen delivery system for any patient, all those attitude help in reduce infection rate in ICU patient.

5.2 Conclusion

Based on finding of presented study it was concluded that:

Majority of study group had bachelor degree and most of them had good knowledge about definition of infection control . About tow third of study group had good knowledge about component of infection control and component of standard precaution . more than half of study group had good knowledge and attitude about hand hygiene , and most of them had good knowledge about chain of infection , time of nosocomial infection occurrence and prevention of infection in their unit .most of study group always cleaned patient care equipment, while majority of them always change suction and oxygen set for any patient, most of study group never wear face mask, gown, eye protection and tow third of them always weared gloves to any procedure. Most of study group some times done oral hygiene.

5.3. RECOMMENDATION

Study recommended that:-

1-Important of training and education of ICU staff about health care associated infection prevention ,because it is apart of comprehensive infection control program.

2-Hand hygiene is necessary ,folowing five moment of hand hygiene, it consider first defense mechanism against infection.

3-Oral hygiene should be done for any patient need it to prevent fungal infection.

4-Encorage use personnel protective equipment to minimize incidence of infection trans mission.

5- periodic assessment by head of nurses to assess staff compliance to standard precaution and other infection control measure.

REFRANCES

1- Bearman,Stevens ,Edmond , Wenzel Aguide to infection control in the hospital fifth edition 2014 Boston,MA. USA

2- Medical dictionary. Free medical dictionary.com on 9\11\2016 at10:15Am

3- Hmythri and Krkashinas Nosocomial infection in patient admitted in intensive care unit Annals of medical health science research V.4(5) sep-oct 2014

4- Brunner and Suddarth Text book of medical. Surgical nursing 10th eddition copy right 2003

5- Elizabeth,Simth Infection control in intensive care unit third place 2011

6- Dr.T.V.RaoMD ICUinfection,infection control inICU nov,11,2011

7- Farideh Kouchak and Mehrdad Askarian nosocomial infection . the definition criteria Iranian journal of medical science jan, 2012 V37(2)72.73

8- Yatin Mehta , Abhinay Gupta,SubHash todui, Snmyatra, D.P.samaddar, VijayaPatil,Pradip Kumar , Bhattacharya ,andSuresh RamaSubban Guide line for prevention of hospital acquired infection Indian journal of critical care nursing 2014,Mar V18(3)149-163

9- WWW.Indus.Org/Health care/scientific%20Rajoo%20singh%20chhina%20-%20infections%20ICU.pdf on 3/11/2016 at 9:18am

10-Helen lemass,NiamhMCdonnel, Dr. sheila Rochford Infection prevention and control for primary care in Irland Aguide for general practice First edition 2013

11-Medical Development Division, Ministry of health malaysia Policies and procedure on infection control 2nd edition 2010

12-Dr ling moilin, Ms tee yong ming , Ms lily lang , Ms lee lai chee ,Ms lam fong kin ,Ms lee shu lay National infection control guide lines Draft for consultation 2016

13- Infection prevention and control team , Infection prevention and control policy , version 5 2015

14-Dr.Ruchica Jagota Study of knowledge , awareness and practice of infection control amonge hospital staff in intensive care unit of government medical college and hospital CHANDIGAR Panjab university may-july 2010

appendix

Shendi university

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Questionnaire about assessment of nurses knowledge regarding infection control in intensive care unit

Part(1):

1-Education level:

a)Diploma ( ) b)bachelor ( ) c)master( ) d)PHD( )

2)Experience level:

a)less than 2years( ) b)2-5years( ) c)more than5years( )

3) previous training program:

a)yes( ) b)No( )

Part(2):

4)Definition of infection control:

A)policies and procedure use to minimize risk of spreading infection( )

b)prevent disease occurrence ( )

c)proken of infection process ( )

5)component of infection control:

a)Hand hygiene( ) b)standard precaution( ) c)Isolation( )

d)waste management( ) e)all above( )

6)Standard precaution include:

a)Hand hygiene( ) b)personal protective equipment( )

c)save injection practice( ) d)save handling of contaminated equipment( )

e)respiratory hygiene( ) f)all above ( )

7) benefit of using personal protective equipment in ICU:

a)protect your self( ) b)protect P.T( ) c)both( )

8)Hand washing indication in ICU:

a)before caring of patient( ) b)after contact P.T skin( )

c)before donning sterile gloves( ) d)before clean or aseptic procedure( )

e)all above

9)Hand hygiene method are used in icu:

a)alcohol based hand rub ( ) b)Hand wash with soap and running water( )

10)Chain of infection :

a)reservoir( ) b)rout of transmission( ) c)susceptible host( )

d)all above( )

11) time of Nosocomail infection occurrence in patient stay in icu:

a)48 hours( ) b)72 hours( ) c)week( )

12)Most common type of nosocomial infection in icu:

a)Blood stream infection ( ) b)Pneumonias( ) c)urinary tract infection( )

d)Post operative wound infection( )

13)Risk factor for nosocomial infection in intensive care unite:

a)malnutrition( ) b)hypo albuminemia( ) c)tracheostomy pt( )

d)catheterized patient( ) e)central line( )

f)diabetsmellitus( )

14)prevent the infection in icu by:

a)safe handling and disposable of sharp( ) b)Hand hygiene ( )

c)give antibiotic ( ) d)change of access( )

Shendi university

Faculty of post graduate of high nursing

Check list about assessment of nurse attitude about infection control in ICU

Procedure	Never done	Some times	frequently	always
Hand washing: -before clean/Aseptic procedure -before touch patient -after touch patient -after touch patient surrounding				
Personnel protective equipment: -wearing gloves during any procedure -face mask -gown -eye protection				
Oral hygiene -Daily at morning -After suction				
Catheter care				
Dispose of waste in right place (needle)				
Cleaning and disinfection before invasive procedure				
Patient care equipment cleaning and disinfection				
Elevate head of bed and check micro aspiration				
Suction: -Change suction tube after each suction. -use anti sterile solution to flush Suction tube				
Change oxygen delivery system for any patient				