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**Assessment Of Quality Of infection Control In Nursery In
River Nile Hospital (March- July 2018)**

**A Research Submitted as Partial Fulfillment for Requirement of
bachelor degree in nursing**

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الآية الكريمة

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قال تعالى:

((يَا أَيُّهَا النَّاسُ إِن كُنْتُمْ فِي رَيْبٍ مِّنَ الْبَعْثِ فَإِنَّا خَلَقْنَاكُمْ مِّن تُّرَابٍ ثُمَّ مِّنْ نُطْفَةٍ ثُمَّ مِّنْ عَلَقَةٍ ثُمَّ مِّنْ مُّضْغَةٍ مُّخَلَّقَةٍ وَغَيْرِ مُخَلَّقَةٍ لِّنُبَيِّنَ لَكُمْ ۚ وَنُقِرُّ فِي الْأَرْحَامِ مَا نَشَاءُ إِلَىٰ أَجَلٍ مُّسَمًّى ثُمَّ نُخْرِجُكُمْ طِفْلًا ثُمَّ لِتَبْلُغُوا أَشُدَّكُمْ ۖ وَمِنْكُمْ مَّن يُّتَوَفَّىٰ وَمِنْكُمْ مَّن يُّرَدُّ إِلَىٰ أَرْدَلِ الْعُمْرِ لِكَيْلَا يَعْلَمَ مِنْ بَعْدِ عِلْمٍ شَيْئًا ۚ وَتَرَىٰ الْأَرْضَ هَامِدَةً فَإِذَا أَنزَلْنَا عَلَيْهَا الْمَاءَ اهْتَزَّتْ وَرَبَتْ وَأَنْبَتَتْ مِنْ كُلِّ

زَوْجٍ بَّهِيحٍ))

صدق الله العظيم

سورة الحج الآية (5)

Dedication

We would like to dedicate this research to

my parent

to my sisters and my Brothers

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We would like to express our very great appreciation to Dr Eman zain Elabdeen for her informative guidance during study time .

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Abstract

Background: Nosocomial infection cause significant morbidity and mortality in neonate intensive care unit patient . neonate , particularly those who are pre-term and low birth weight, are at higher risk of acquiring infection compared with full term .**Objective:** The study was conducted to assessment quality of infection control in nursery. **Study designs:** it was , descriptive qualitative cross sectional study conducted in the period from march 2018 to July 2018 at river Nile hospital. **study area:** nursery unit **Data analysis:** The data was analyzed by using statistical package of social science (SPSS) , Chi-Square and excel program was used for figures and was presented in tables, figures presentation **Result:** the majority of NICU designs percentage between 54% to 63% while few of hospitals percentage 90% from ideal designs. NICU hand washing percentage between 68% to 84% in majority of hospital ,while few of hospital percentage between 89%to 100% . use of PPE percentage 25% in majority hospital, while few of hospital percentage is 66%. NICU invasive procedure percentage between 82% to 100% in majority hospital , while few of hospital percentage is73%. NICU isolation percentage between 0% to 11%, while few of hospital percentage is55% .NICU sterilization percentage between 40%to 53% in majority of hospital, while few of hospitals percentage is60%. NICU linen handling percentage between 35% to 57% in majority of hospital , while few of hospital percentage is 85%

Conclusion :The majority of hospitals at River Nile state were performed low to moderate level from infection control tools, while the few of hospitals were performed high levels from infection control tools.

المستخلص

تتسبب العدوى المكتسبة بشكل كبير في الوفيات عند مرضي وحدة العناية بحديثي الولادة ولاسيما أولئك الذين هم في سن مبكرة وانخفاض الوزن عند الولادة هم أكثر عرضة للإصابة بالعدوى مقارنة مع ألمدي الأكبر سنا الهدف تم إجراء الدراسة لتقييم جودة مكافحة العدوى في الحضانة تم تصميم دراسة وصفية مقطعية نوعية أجريت في الفترة من مارس 2018 حتى يوليو 2018 وفي وحدة حضانة دراسة مستشفيات نهر النيل تحليل البيانات تم تحليل البيانات باستخدام حزمة إحصائي للعلوم الاجتماعية (SPSS) تم استخدام برنامج Chi-Square and exact وتم تقديمه في الجداول والأرقام التقدمة النتيجة: في تصميم غرفة حديثي الولادة النسبة المئوية بين 54% - 63% في غالبية المستشفيات بينما عدد قليل من المستشفيات كان تصميم غرفة حديثي الولادة بالنسبة المئوية بين 90% نسبة غسل الأيدي بين 68% - 84% من المستشفى في هزة الإثراء نسبة مئوية أقل من النسبة المئوية بين 89% - 100% نسبة 25% من معدات الوقاية الشخصية في حين إن نسبة قليلة من المستشفيات هي 66% نسبة الإجراء 82% - 100% في غالبية المستشفيات في حين إن نسبة مئوية قليلة من المستشفى تبلغ 73% نسبة العزل في غرفه حديثي الولادة 0% - 1% في حين إن نسبة قليلة من المستشفيات 5% نسبة التعقيم في غرفة حديثي الولادة بين 40% - 53% في غالبية المستشفيات في حين إن عدد قليل من المستشفيات 60% نسبة التعامل مع الكتان بين 35% - 57% حين إن عدد قليل من المستشفيات هو 85% الخاتمة: كانت الغالبية من مستشفيات نهر النيل تطبق التحكم في العدوى بمستوى منخفض إلي متوسط بينما البعض منها يطبق بمستوى عالي من التحكم في العدوى .

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List of abbreviation

Abbreviation	Means
ABG	Arterial blood gas
CDC	Centers for disease control
CHG	Chlorhexidine glaciante
HCWS	Health care workers
IC	Infection control
NICU	Neonatal intensive care unit
OSHA	Occupational safety and health administration
PPE	Personal protective equipment
SPSS	Statistical package of social science

Chapter One

Content:

- Introduction
- Problem Statement
- Justification
- Objectives

1.1 Introduction:-

Nursery (room) a room within the hospital designed for the care of a young child or children ^[1] Most babies admitted to the NICU are premature (born before 37 weeks of pregnancy) have low birth weight (less than 5.5 pounds) or have a medical condition that requires special care In the U.S. nearly half a million babies are born preterm and many of these babies also have low birth weights Twins, triplet, and other multiples often are admitted to the NICIU as they tend to be born earlier and smaller than single birth babies, Babies with medical conditions such as heart problems, infections or birth defects are also cared for in the NICU ^[2]. Infection control is the discipline concerned with preventing nosocomial or health care associated infection a practical (rather than academic) sub discipline of epidemiology ^[3].Infection control addresses factors related to the spread of infection within the health care setting (whether patient –to patient ,from patients to staff and from staff to patient or among staff) including prevention (via hand hygiene, cleaning disinfection, sterilization, vaccination, surveillance) monitoring investigation of demonstrated or suspected spread of infection within a particular health care setting (surveillance and outbreak investigation) and management (interruption of outbreak) ^[3]. Aseptic technique is a key component of all invasive medical procedures Similarly ,infection control measures are most effective when standard precautions (health care) are applied because undiagnosed infection is common^[4].the immune system of neonates is relatively under – developed and relies on maternal antibodies transmitted in uterus to modify and control the severity of neonate disease, these antibodies which can be transported across the placenta, the immune response in early life is dampened compared to adult ^[4].

1.2 Problem Statement:- AT stander of other study the new born and premature with low immune system ,five million infants die in the first year of life ,1.5 million of these deaths are due to infection .

1.3 Justification:-

Because infection transmission the major cause of mortality and morbidity in children so the performance of infection control tool it is very important in nursery to decrease mortality rate.

1.4 Objectives:

1.4.1 General objective:-

The study was conducted in order to survey the assessment of quality of infection control in nursery in river Nile hospital 2018

1.4.2 Specific Objectives :-

- To assess the quality of sterilization methods in nursery .
- To evaluate the designs of nursery unit.
- To assess the quality of linen handling in nursery.
- To detect the type of Personal protective Equipment used in nursery.
- To assess quality of infection control in isolation room in nursery.
- To assess the quality of medical hand washing.
- To evaluate invasive procedure care in nursery.

Chapter Two
Literature Review

Literature Review

2.1 Previous study:-

Susan, et al (2014) studying infection control and hospital epidemiology the **study was aimed** is to assess strategies use to prevent MRSA transmission and central line associated blood stream infections in NICUs. The **result** from study is staff from 162 of 342 NICUs responded (response rate 74.3%) most (92.3%) NICUS use central line insertion and maintenance bundles ,but maintenance practices varied including agents used for antisepsis and frequency of dressing changes Forty-two percent reported routine screening for all patients. Chlorhexidine glaciante (CHG) use for central line care for at least one indication (central line insertion ,dressing changes ,or port -cap antisepsis) was reported in 82 NICUs (51.3%) Among sixty-five NICUs responding to question on CHG use restrictions, 46.2% reported no restriction^[5].

Yassin s. Ibrahim et al 2011 assessment of infection control practices in NICU **study was aimed** to explore the Infection Control (IC) management system and practices at the implementation level by Health Care Workers (HCWs) **results** Embaba General Hospital has well organized institutionalized system for IC The NICU setting has satisfactory resources Out of the total 291 observed patient-contacts 61% were done by nurses Performance in hand hygiene was scored as poor (67%) before patient contact and good (84%) after patient contact (p=0.00) Compliance to standard was scored as good in hand washing (82%)and in IV fluid preparation (87%) while poor in cannula insertion (74%) Specialists reported excellent (100%) performance score in standard of IC in umbilical catheter insertion The study concluded the presence of a gap between IC hospital management and HCWs in NICU due to lack of constructive supervision especially during night shifts^[6].

2.2 Hand hygiene:-

Independent study by Ignaz Semmelweis in 1846 in Vienna and Oliver Wendell Holmes, Sr. in 1843 in Boston established a link between the hands of health care workers and the spread of hospital-acquired infections. The Centers for Disease Control and Prevention (CDC) state that "It is well documented that the most important measure for preventing the spread of pathogens is effective hand washing."^[7] In the developed world, hand washing is mandatory. In the United States, OSHA standards^[8] require that employers must provide readily accessible hand washing facilities, and must ensure that employees wash hands and any other skin with soap and water or flush mucous membranes with water as soon as feasible after contact with blood or other potentially infectious material^[9].

2.3 New born feeding:-

Babies in the NICU often have feeding difficulties because the activity requires many different body systems. Breast feeding it is important to make your baby's medical team aware of your desire to breastfeed. To heighten the chance of successful breastfeeding, the baby's mother should start pumping immediately after birth and frequently about every two hours, the mother should make sure to pump until the breast is empty of milk, including the hind milk that is high in milk fat and essential to baby's nutritional needs.^[10]

2.4 linen handling:-

The provision of clean linen is a fundamental requirement for patient care. In correct procedures for handling or processing of linen can present an infection risk both to staff handling and laundering linen, and to patients who subsequently use it. Any linen that has not been used since it

was last laundered and that has not been close proximity to patient or stored in a contaminated environment. ^[11]

2.5 NICU designs:-

It contains substantive changes in recommendation for pt room size and feeding preparation area , and number of refinements of previous recommended standard with respect to family space , hand hygiene , lighting and other aspect of NICU. ^[12]

2.6 NICU standard:-

Unit configuration, Location within the hospitals , Single family room, Space Airborne infection isolation ,Electrical gas supply and mechanical ,Staff support space Ambient lighting in infant care area and Acoustic environment ^[12].there shall be an aisle adjacent to each infant space with minimum width of 4 feet (1.2 meters) in multiple bed rooms. when single infant rooms or fixed cubicle partitions are utilized in the designs, there shall be an adjacent aisle of not less than 8 feet (2.4 meter) in clear and unobstructed width to permit passage of equipment and personnel ^[12].

2.7 Invasive procedure:-

Define:-Any surgical or exploratory activity in which the body is pierced by , instrument or manual digitations^[13]. **Endotracheal suction** Is procedure done to remove secretion from trachea and bronchi and facilitate respiration **Indication** Unable to expectorate coughed secretion .Unable to swallow rattling breath sound^[14]..**Infusion pump** Help to administer specific amounts of medication and fluid over specified time periods at predetermined rates and avoid the need to monitor drip rates and also prevent dosing error. For smaller amount of medication and infection syringe infusion pump are used but for maintenance fluid in line infusion pump are used ^[15].

Urinary catheterization It's the insertion of catheter directly into the urinary bladder the rough the route of urethra. **Indication:-**

preoperatively. in case of urinary retention or in continence, failure cHf, for collection of sterile urinary samples^[14]. **Enema** are used to help relive impacted bowel movement, **Purpose** to stimulate defection, to treat constipation To relive gaseous distension To relive inflammation^[14]. **Nasogastric tube insertion** is soft plastic tube inserted via the nostril up to the stomach and help in feeding ,gastric decompression, drainage of secretions and to perform gastric lavage^[15]. **Arterial blood sampling** Is need for determination of arterial blood gas (ABG)values in sick children. The sample is collected in a heparinized syringe to avoid clotting and transported in an icebox immediately to the lab after ensuring that there were no air bubbles in the sample^[15]. **Sampling procedure** Collection of specimens for various diagnostic investigations is done routinely and the specimens should be collected with proper technique, labeled correctly and sent to the right laboratories with duly filled out requisition forms giving all the details^[15].

2.8 Sterilization:-

is a process intended to kill all microorganisms and is the highest level of microbial kill that is possible. Sterilizers may be heat only, steam, or liquid chemical^[16]. First, mechanical indicators and gauges on the machine itself indicate proper operation of the machine. Second heat sensitive indicators or tape on the sterilizing bags change color which indicate proper levels of heat or steam. And, third (most importantly) is biological testing in which a microorganism that is highly heat and chemical resistant (often the bacterial endospore) is selected as the standard challenge. If the process kills this microorganism, the sterilizer is considered to be effective^[16]. Sterilization, if performed properly, is an effective way of preventing bacteria from spreading. It should be used for the cleaning of the medical instruments or gloves, and basically any type of medical item that comes into contact with the blood stream and sterile

tissues. Considered to be There are four main ways in which such items can be sterilized: autoclave (by using high-pressure steam), dry heat (in an oven), by using chemical sterilants such as glutaraldehydes or formaldehyde solutions or by radiation (with the help of physical agents). The first two are the most used methods of availability. Steam sterilization is one of the most effective types of sterilizations, if done correctly which is often hard to achieve. Instruments that are used in health care facilities are usually sterilized with this method. The general rule in this case is that in order to perform an effective sterilization, the steam must get into contact with all the surfaces that are meant to be disinfected. On the other hand, dry heat sterilization, which is performed with the help of an oven, is also an accessible type of sterilization, although it can only be used to disinfect instruments that are made of metal or glass. The very high temperatures needed to perform sterilization in this way are able to melt The are not made of glass or metal. Steam sterilization is done at a temperature of 121 C (250 F) with a pressure of 209 kPa (15 lbs/in²)^[17].

2.9 Disinfection:-

Disinfection uses liquid chemicals on surfaces and at room temperature to kill disease causing microorganisms. Ultraviolet light has also been used to disinfect the rooms of patients infected with *Clostridium difficile* after discharge.^[18] Disinfection is less effective than sterilization because it does not kill bacterial end spores^[16].

2.10 Personal protective equipment:-

Personal protective equipment (PPE) is specialized clothing or equipment worn by a worker for protection against a Disposable PPE hazard. The hazard in a health care setting is exposure to blood, saliva, or other bodily fluids or aerosols that may carry infectious materials such as Hepatitis C, HIV, or other blood borne or bodily fluid pathogen. PPE prevents contact

with a potentially infectious material by creating a physical barrier between the potential infectious material and the healthcare worker. The United States Occupational Safety and Health Administration (OSHA) requires the use of Personal protective equipment (PPE) by workers to guard against blood borne pathogens if there is a reasonably anticipated exposure to blood or other potentially infectious materials^[19]. Components of PPE include gloves, gowns, bonnets, shoe covers, face shields, CPR masks, goggles, surgical masks, and respirators. How many components are used and how the components are used is often determined by regulations or the infection control protocol of the facility in question. Many or most of these items are disposable to avoid carrying infectious materials from one patient to another patient and to avoid difficult or costly disinfection. In the US, OSHA requires the immediate removal and disinfection or disposal of a worker's PPE prior to leaving the work area where exposure to infectious material took place. ^[20].

2.11 Antimicrobial surface:-

Microorganisms are known to survive on non-antimicrobial inanimate 'touch' surfaces (e.g., bedrails, over-the-bed trays, call buttons, bathroom hardware, etc.) for extended periods of time. ^{[21] [22]}. This can be especially troublesome in hospital environments where patients with immune deficiencies are at enhanced risk for contracting nosocomial infections. Products made with antimicrobial copper alloy (brasses, bronzes, cupronickel, copper-nickel-zinc, and others) surfaces destroy a wide range of microorganisms in short period of time ^[23]. The United States Environmental Protection Agency has approved registration of 355 different antimicrobial copper alloys and on synthetic copper – infused hard surface that kill E.coli 0157:H7, methicillin – resistant staphylococcus aureus, staphylococcus enterobacter aeruginosa in less than 2 hour of contact. As ^[21]. public hygienic measure in addition to regular cleaning

antimicrobial copper alloys are being installed in healthcare facilities in U.K ,Ireland ,Japan ,Korea ,France ,Denmark , and brazil ^[24].

2.12 Incubator care:-

New born babies take time to accustom to the external environment especially if they on premature and low birth weight. As they are on risk to develop hypoxia, hypothermia and other many associated adverse conditions, need especial care and attention . Incubator is process of providing an environment to keep them warm and suitable for their development. Purpose:- Provision of desired humidity and oxygenation .Isolation new born babies from infection, unfavorable external environment and stimulation . -Observation of very sick neonate-Type :- Portable and non-portable ,Open box type ,Close type Double walled type, Servo control incubator Cleaning and sterilization :-Should be cleaning daily with mild detergent Humidifier champers must be emptied and cleaned daily, fill with fresh distilled water After seven days should be shifted to another incubator and use incubator should be cleaned with antiseptic solution 1-2 ml of glacial acetic acid or vinegar can be added to water in the humidifier to prevent bacterial growth ^{[25] [26] [27] [28]}.

2.13 Isolation:-

In the health care context, medical isolation refers to various physical measures taken to interrupt nosocomial spread of contagious diseases. Various forms of isolation exist, and are applied depending on the type of infection and agent involved, to address the likelihood of spread via airborne particles or droplets, by direct skin contact, or via contact with body fluids. In cases where infection is merely suspected, individuals may be quarantined until the incubation period has passed and the disease M Groups may undergo quarantine, or in the case of communities, a cordon sanitaire may be imposed to prevent infection from spreading ^[29]

