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Nurses- Midwives Practices Towards Infection Control Precautions at Wards in Al Najaf Hospitals

For the Degree of Doctorate of Philosophy in Nursing

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بِسۡمِ ٱللَّهِ ٱلرَّحۡمَٰنِ ٱلرَّحِيمِ

وَيُنَزِّلُ عَلَيْكُم مِنَ السَّمَآءِ مَآءً لِيُطَهِّرَكُم بِهِ وَيُذْهِبَ عَنكُمْ رِجْزَ الشَّيْطَانِ وَلِيَرْبِطَ عَلَى قُلُوبِكُمْ وَيُثَبِّتَ بِهِ الأَقْدَامَ *

(الانفال 11)

صدق الله العلي العظيم

DEDICATION

WITH GREAT RESPECT I DEDICATE THIS WORK:

TO MY MOTHER, AND FATHER, ALLAH BLESS THEIR SOULS.

WITH SPECIAL THANKS TO MY HUSBAND - MY GREATEST SUPPORTERS (HUSSAIN) AND MY SON (ALI). MY DAUGHTER (LOGIN) AND UNCLE.

TO MY FAMILY MEMBERS ESPECIALLY MY SISTERS MY BROTHERS AND MY FRIENDS AND ALL THOSE WHO SUPPORTED ME.

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Abstract:-

Infections developed throughout childbirth are mutual reason of perinatal and maternal morbidity and mortality. Altering worker behavior and settings of organization within the system of health is a vital for dropping the infection spreading. Infection control precautions importantly relied on occurrence of extremely qualified and informed staff as midwives-nurse.

This descriptive cross-sectional design was done from Nov. 4th, 2021 to Mar. 13th, 2023 to evaluate nurse –midwives measures of precautions for controlling infection by nurses- midwife's working in the maternal surgical wards. A sample of (n=100) were selected from: Al-Forat Teaching Hospital (25), Al-Zahra Teaching Hospital (30), Al-Sajad General Hospital (15) and Al-Hakim General Hospital (30) to meet the objectives of the study

A questionnaire and observational checklist were constructed and organized followed by the investigator after extensively review of related literatures, it comprises of socio-demographic characteristics and work-related data of nurses - midwives.

The results of the study revealed that the mean of the score of the overall infection control precautions practices for all domains was (1.59). the current study results also showed that the mean overall practices score of the respondents about hand hygiene, was (1.87). the overall practice score about personal protective equipment was (1.35). the overall practice score gowns or aprons was (1.96) the overall practice score about Prevention of sharp injuries of infection control precautions (1.56)) the overall practice score about contamination with blood/ body fluids was (1.43) the overall practice score about waste management was (1.44). and finally, the overall practice score about environment was (1.54)

The findings of the present work also revealed that there is a significant positive correlation had been found between educational status of participants and their overall practice score (R = 103.78, p. value = 0.000). Other significant positive correlation was found between Marital Status (R = 7.86, P. value = 0.001).

It was concluded that the nurse-midwives had a poor level of practices. The study recommended an intensive training courses programs with updated infection control precaution detailed information.

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List of Abbreviations and Symbols

CDC	**Centers for Disease Control**
HICPAC	**Hospital controlling Infection Practices Advisory Committee**
et.al	**And other**
HCWs	**Health-care workers**
HAI	**Hospital-acquired infection**
PPE	**Personal Proactive Equipment**
IPC	**Infection Preventing and Controlling**
HH	**Hand Hygiene**
SP	**Standard Precautions**
COVID-19	**Corona Virus Disease**
MDROs	**Multi-Drug-Resistant Organisms**
LTCFs	**Long-standing care services**
CS	**Caesarean Delivery Section**
SSI	**Site Surgical Infection**
HBV	**Hepatitis B Virus**
ICU	**Infection Control Universal**
LMICs	**low Income Middle and Countries**
HCWs	**Health Care Worker**
MOH	**Ministry of Health**
SAMM	**Severe Adverse Maternal Morbidity**
Team STEPPS	**Team Strategies and Tools to Enhance Performance and Patient Safety**
USA	**The United States of America**

UK	**United Kingdom**
UN	**United Nations**
U. S	**United States**
WHO	**World Health Organization**
Freq.	**Frequency**
P. Value	**Probability Value**
S	**Significant**
S. D	**Standard Deviation**
SPSS	**Statistical Package of Social Sciences**

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Chapter one

Introduction

1.1 Introduction

Infection control precautions are standard working strategies applying to patients care and treatment, regardless of their perceived infectious hazard. These safety measures incorporate hand washing, utilization of personal protective equipment, aseptic technique, suitable reprocessing of instruments and application of environmental controls. SICPs should involve safe frameworks for blood handling (involve dried blood), other body liquids, secretions, and discharges (barring sweat), non-intact skin and mucous layers. Precautions are custom to the infectious agent and may incorporate measures to avoid airborne, contact or droplet transmission and health care associated transmission agents (Sydnor *et al.*, 2011).

The prevention and control of infections is critical for a well-functioning health system. However, worldwide an estimated 21 million cases of hepatitis B virus infection and 200 000 cases of human immunodeficiency virus (HIV) infection result from unsafe injection practices each year (Bedoya, 2017).

Occupational exposure to blood can result from percutaneous (needle stick or other sharps injury) and mucocutaneous injury (splash of blood or other body fluids into the eyes, nose, or mouth), or blood contact with non-intact skin (Giuffrida, 2020).

Blood, certain other body fluids (e.g., semen; vaginal secretions; and amniotic, cerebrospinal, pericardial, peritoneal, and synovial fluids), and tissues of all patients should be considered potentially infectious. Standard precautions apply to blood; all body fluids, secretions, and excretions (except sweat); non-intact skin; and mucous membranes (PHE, 2020).

The core elements of standard precautions comprise of hand washing after patient contact, the use of barrier precautions (e.g., gloves, gowns, and facial protection) to prevent mucocutaneous contact, and minimal manual manipulation of sharp instruments

and devices and disposal of these items in puncture-resistant containers (Chia *et al.,* 2020).

Standard Precautions intend to preventing contact between blood and body fluids from patient and mucous layers of health care personnel (involve conjunctivae), skin and garments, avoiding health personnel from conveying possibly contaminated substantial from one patient to the next then maintaining a strategic distance from superfluous contact to polluted sharp executes (Olson *et al.,* 2016).

Beyond individual factors, the hospital environment has been shown to be a contributing factor in the spread of HCAIs and MDROs Moreover, pathogens can survive for days or months on surfaces that have not been cleaned, posing an ongoing risk for transmission. Consequently, there is a higher risk of a patient acquiring a pathogen from the previous room occupant. (Mitchell, 2019).

Health care personnel ought to survey their danger for presentation and select personal protective equipment (PPE) suitable for the circumstance, and all workers in the same procedures as one group must be utilizing the same level of PPE. (Brasil, 2016).

All health care providers ought to be educated in the right utilize and transfer of PPE and have the capacity to show the capacity to wear PPE rapidly in urgent circumstances and safely takeoff. Non–health care workers in participation ought to be situated far from regions of presentation danger or enough ensured. (Bauchner *et al.,* 2020).

Non-appearance of empowering environment in the health organization, for example, an absence of consistent running water or a deficiency of PPE, would prompt poor consistence with infection control measures. Therefore, gets to be significance to evaluate the level of compliance with all universal precautions by the different sorts of HCPs who

reach women, and level of compliance by HCPs in the different sorts of health facilities. (Amoran, 2013).

Health care workers (HCWs) are at risk of various occupational hazards in the hospital, including exposure to blood borne infections such as Human Immuno-deficiency Virus (HIV) and hepatitis B and C virus (HBV and HCV) infection from sharps injuries and contact with body fluids. Hospital-acquired infection (HAI) is one of the common problems and difficulties faced by hospitals in all countries around the world. Since nurses are part of the healthcare team that plays a unique role in the control of hospital infection, this study is conducted to analyze the knowledge and practice of healthcare personnel about standard precautions for hospital infection. (Sarani et al., 2014).

Nurses may acquire an infection during the provision of nursing care because of occupational exposure to microorganisms. Relevant literature reports that, compliance with Standard Precautions (a set of guidelines that can protect health care professionals from being exposed to microorganisms) is low among nurses. Additionally, high rates of exposure to microorganisms among nurses via several modes (needle sticks, hand contamination with blood, exposure to air-transmitted microorganisms) occur. (Sarani *et al.*, 2016).

Compliance on the part of healthcare workers (HCWs) with standard precautions has been recognized as being an efficient means to prevent and control health care associated infections. (Abdulraheem *et .al.*, 2012).

Health care personnel ought to survey their danger for presentation and select personal protective equipment (PPE) suitable for the circumstance, and all workers in the same procedures as one group must be utilize the same level of PPE. (Brasil, 2016).

Interventions aimed to improve HCWs' compliance with infection prevention and control (IPC) practices such as hand hygiene or antimicrobial

stewardship have achieved varied success. These interventions have focused on feedback mechanisms, reminders, 'champion' roles and financial incentives. (Edwards, 2016).

Standard Precautions (SP) are the minimum infection prevention practices that apply to all patient care, regardless of suspected or confirmed infection status of the patient. So that many studies have aimed to assess factors that influence nurses' compliance with standard precautions regarding occupational exposures to blood and body fluids. (Esmail *et .al.*, 2019).

Health care workers must estimate the potential presentation to probable infective substantial when providing health personnel and safeguard themselves as needs be, depend on medical collaboration level with patient and bodily space where given health care. Additionally, health care personnel must use cleanser and water or liquor (gels, flushes, foams) at least, prior, and afterward patient connection and subsequent to take off personal protective equipment (PPE). (Saiman, 2013).

Improved cleaning can reduce the incidence of HCAIs and is cost effective, but relies on healthcare personnel to correctly and consistently apply cleaning measures. Nurses and midwives have the most contact with patients across healthcare settings. Therefore, they have a critical role in infection prevention and control. As an important first step in improving compliance and precursor to further work, enrolled nurses, registered nurses and midwives' knowledge on the role of the environment in the infection prevention control, and sort out the barriers and challenges for nurses and midwives to maintaining a clean patient environment. (White,2020).

Subjective indicators such as visible dirt, personal appearance and whether a patient had been identified as being infectious, can inform nurses' decision-making regarding even basic standard precautions such as hand washing. (Bouchoucha, 2017) .

This reliance on personal judgment rather than consistent application of clinical standards for infection prevention and control could potentially lead to cross-contamination and subsequently, increase rates of infection. Experience, organizational structure (including staffing ratios and training), individual knowledge, and personal accountability may also impact on compliance with optimal infection control practice and governance. (Mitchell, 2017).

Needle stick injury (NSI) is the most common form of occupational exposure to blood which results in transmission of blood borne infection. Healthcare-associated infections (HAIs) have been reported to be a serious problem in the healthcare services as they are common causes of illness and mortality among hospitalized patients including HCWs. the significance of infection control in health care settings cannot be overemphasized as both the patients and HCWs are capable of spreading microorganism if adequate infection control measures are not strictly adhered to. In addition, healthcare is increasingly being provided outside hospitals in facilities such as nursing homes, free standing surgical and outpatient centers, emergency care clinics, and in patients' homes or during pre-hospital emergency care. (International Council of Nurses, 2020).

Compliances with these standard precautions has been shown to reduce the risk of exposure to blood and body fluids. The term "standard precautions" is replacing "universal precautions", as it expands the coverage of universal precautions by recognizing that anybody fluid may contain contagious and harmful microorganisms. (Royal College of Surgeons, 2020).

However, ensuring compliance with these practices depends on understanding the extent of the problem and there has been little research on infection prevention and control practices in low- and middle-income countries, particularly in primary health care. (WHO, 2017).

Previous studies have several limitations. First, many involved small samples – one review found that only 10 of 41 studies on hand hygiene interventions were conducted in more than one hospital. Second, they were often based on self-reported data from health-care providers, which tend to overestimate compliance. Third, they frequently focused on single domains, such as injection safety, rather than on the range of possible exposures encountered by patients during outpatient visits. consequently, given that infections are transmitted by multiple pathways, these data are of limited use for modeling the spread different pathogens. (WHO, 2018).

The level of practice of universal precautions by HCWs may differ from one type of HCW to another. The differences in knowledge of universal precautions by HCWs may be influenced by their varying type of raining. (Russell, 2020).

The absence of enabling environment in the health institution, such as a lack of constant running water or a shortage of personal protective equipment (PPE), would lead to poor compliance with universal precautions. It therefore, becomes importance to assess the level of compliance with universal precautions by the various types of HCWs (doctors, trained nurses, pharmacist, laboratory, scientist, other health workers, and domestic staff) who make direct contact with patients, and level of compliance by HCWs in the various types of health facilities. (WHO, 2021).

There is a new public health crisis threatening the world with the emergence and spread of 2019 novel corona virus (2019-nCoV) or the severe acute respiratory syndrome corona virus-2 (SARS-CoV-2). The virus originated in bats and was transmitted to humans through yet unknown intermediary animals in Wuhan, Hubei province, China in December 2019. There have been around 96,000 reported cases of corona virus disease 2019 (COVID-2019) and 3300 reported deaths to date (05/03/2020) (Singhal, 2020).

Universal precautions which can by the Center for Disease Control and Prevention are a set of precautions designed to prevent the transmission of blood borne pathogens when providing health care. under universal precautions principles, the exposure incidents can be significantly decreased by using personal protective barriers like gloves, face mask, protective eyewear, overhead cap and gowns in addition to hand washing after gloves disposal, unreaping needles, hygienic disposal of medical wastes, and sterilization of surgical instruments. (Styrkarsdottir, 2013).

Implementing standard precautions (SP) has been a major challenge for health care workers (HCWs) especially those in developing countries thereby compromising their safety and increasing their exposure to blood-related pathogens. Compliance with safety precautions and occupational accidents among health workers are often unreported. (Akagbo *et al.,* 2017).

The Infection in hospitals and other healthcare settings is a problem for health services around the world and major public health problem which is receiving considerable attention and the problems related to this is very serious which causes major health risks that leads to morbidity, mortality and cost. (WHO, 2021).

In the United States of America, an estimated 40 000 to 80 000 deaths are due to nosocomial infections annually, which may cost as much as 4.5 billion United States dollars. Moreover, the rapid spread of multidrug-resistant organisms and outbreaks of Ebola virus disease, yellow fever and Zika virus infections has further increased the human and financial cost. Fortunately, proven and cost-effective, infection prevention and control practices can reduce the risk. and Infection prevention and control measures aim to ensure the protection of those who might be vulnerable to acquiring an infection both in the general community while receiving care due to health problems in the range of settings. (Gulilat, 2014).

Infection control refers to all policies, procedures and activities which aim to prevent or minimize the risk of transmission of infectious disease at health care facilities. The emerging of life-threatening infections such as acute respiratory syndrome and emerging of other infectious diseases have highlighted the need for efficient infection control programs in all health care setting and capacity building for HCW to prevent the transmission of pathogens with in health care setting (WHO, 2014).

Puerperal sepsis (PS) is the 6th driving reason for infection load for females matured 15-44 years, According to The World Health Organization (WHO) classification. Annually5.2 million new instances of (PS)happen and maternal passing resulting after this situation estimated at about 62,000, especially hazardous times of pregnancy are Labor and delivery. Puerperal sepsis is a general term, which has been utilized to incorporate different obstetric and genitourinary tract diseases brought into the mother, life-debilitating contaminations can be brought into the mother and child's organs and circulatory system Apart from the dangers of extreme draining and hindered labor. (WHO, 2014).

Few interventions have targeted the prevention and improved case management of puerperal infection. Factors predisposing to high risks of puerperal infection in Nigeria include home or traditional births in unhygienic conditions, multiple vaginal examinations during labor and childbirth, prolonged labor with or without premature rupture of fetal membranes, caesarean delivery and co-existing HIV/AIDS Thus, infections are most often acquired exogenously, although endogenous and hospital. (Friday *et al.*, 2012).

Despite health care personnel (HCP) in health settings are at significant danger for presentation to body liquids and blood, changing adherence levels for standard precautions have been accounted in health services facility, counting in childbirth and units of delivery. (WHO, 2014).

Therefore, the eye safeguard measurement throughout deliveries has been shown to be polluted by body liquids and blood when paired layers of gloves are utilized for sterile measures the external layers frequently have numerous less punctures. (Mischke, 2014).

Various barriers to the proper utilization of PPE have been referred; including recognition, that personnel protective tool is uncomfortable then bounds aptitude, facemasks or fogging of goggles, the misperception that medical eyeglasses give satisfactory eye insurance, absence of accessible PPE, neglecting to utilize personal protective equipment (PPE).time shortage in pressing clinical circumstances to wear fitting PPE, the observation that patient postures insignificant hazard and worries about impedance by patient consideration. (WHO, 2014).

The prevention and management of healthcare-associated infections (HCAI) has advanced greatly over the last decade due to legislative, regulatory and organizational incentives. However, these changes have not resolved the gap between evidence base and clinical practice, particularly in terms of healthcare workers' (HCWs) behavioral change. (Shah, 2015).

1.2 Importance of study:

Hospital Acquired Infections (HAI) is a major health problem in all societies. According to the WHO, many of the infections and deaths recorded in this global outbreak have occurred in healthcare workers (HCWs). HCWs account for 9% and 13% of the total confirmed COVID-19 cases in Italy and Spain respectively (WHO, 2019).

On 17 April 2020, the Italian National Institute of Health announced that nearly 17,000 HCWs in Italy had contracted the illness Shortly afterwards, the Italian Federation of Medical Associations (FNOMCeO) reported that 139 Italian doctors had so far died of the disease In the UK, as of 28 April 2020, the Government have verified 49 deaths among NHS HCWs due to COVID-19 during the pandemic, although other organizations

report that the actual figure may have surpassed 100 deaths (National Institute of Health, 2019).

Health care associated infections (HCAIs) causes considerable morbidity and mortality, and additional costs. The prevalence of HCAI varies widely across the globe. (Amoran, 2013).

As frontline providers of care, nurses and midwives play a vital role in prevention and control of infections such as COVID19, influenza, multi-drug resistant organisms (MDROs) and health care associated infections (HCAIs) more broadly. However, nurses' and midwives' compliance with infection control policies can vary between settings and individual workers. (WHO, 2021).

Health care personnel (HCPs) direct exposure to danger of blood and other body liquids at their occupation. Therefore, in the childbirth they are at danger of borne of blood disease such as Hepatitis B virus, Hepatitis C virus and human immunodeficiency virus. (Shiao, 2012).

Postoperative surgical site infections (SSI) are an important health care associated (HAI) infection and one of the most frequent causes of post-operative morbidity. In high-income countries, approximately 2% of surgeries are affected by SSIs. Although the rates of SSI are low in United States of America (USA) and European countries it is second frequent type of HAI. (Pathak, 2017).

World Health Organization (WHO) shows that SSIs are most frequently reported type of HAI in low and middle-income countries (LMICs) with a pooled incidence of 11.8 episodes of SSI per 100 surgical procedures In high-income countries the SSI rates for gynecological surgeries are similar to that of other surgical procedures. (WHO, 2016).

Hysterectomy for gynecological causes is reported to have a SSI rate of 1.7% according to the Centre for Disease Control (CDC), USA data SSIs are the second most common complication after urinary tract infections as HAI in cesarean delivery (CD) with reported rates between 3 to 15% in USA

and a cumulative rate of 2.9% in European Centre for Disease Control data from 20 networks in 15 European Union countries. (Pathak, 2019).

However, the rates of SSI following CD have varied from 10 to 20% in studies from LMIC's .in USA an episode of SSI among the gynecological surgeries, doubles the episode cost of care and triples the risk of re-admission (WHO, 2016).

Because of these financial implications the efforts to improve quality of surgery in high-income countries have been initiated. Some such efforts include the CDC's National Health Safety Network (NHSN) and American College of Surgeon's National Surgical Quality Improvement Program in USA. These initiatives have focused on establishing standard methods of data collection on risk factors for SSI and 30-day post discharge surveillance. (Pathak, 2020)

However, the NHSN SSI risk model for obstetric surgeries does not have more than 3 independent variables for predicting SSI. Surgical site infections (SSI) are one of the most common healthcare associated infections in the low-middle income countries. Data on incidence and risk factors for SSI following surgeries in general and Obstetric and Gynecological surgeries in particular are scare. *(*WHO, 2016)

The importance of airborne transmission of microorganisms in the hospital setting and the risk of cross infection between patients and HCWs especially in respect of blood-borne pathogens are widely documented Hospital-based personnel and personnel who provide healthcare outside hospital may acquire infections from or transmit infections to patients, other personnel, household members, or other community contacts. (WHO, 2020).

Puerperal sepsis causes no less than 75000 maternal deaths consistently, for the most part in low-income republics. Studies of high-income nations reported that occurrence of morbidity because of sepsis

altered among 0.1 to 0.6 cases for every thousand conveyances. (Dillen, 2012).

In a study conducted in Iraq, especially in Kurdistan, on viral hepatitis C, which is considered a stigma for many people who are ignorant of how to treat and prevent it. Hence the importance of spreading a culture of knowledge of the epidemic, how to prevent and treat it, and the importance of means of controlling infection. (Khalil *et al.,* 2017).

In another study conducted in Lebanon infection was considered an important cause of maternal mortality and severe maternal morbidity. Global estimates suggest that direct (obstetric) infections are the third most common cause of maternal mortality, representing about 10·7% of maternal deaths, with the largest toll estimated in low-income and middle-income countries (LMICs) at 10·7% compared with high-income countries (HICs) at 4·7%. The contribution of infections to maternal deaths could be larger, as these figures do not include deaths due to abortion-related infections or indirect (non-obstetric) infections, which are not a result of, but aggravated by, pregnancy. (Brizuela *et al.,* 2017).

Application of the principle of infection control is a fundamental part of effective health services to manage infection control effectively, universal principles of disease control depend on the utilization of practices and techniques that counteract or lessen the probability of contagion being transmitted from sources (individual, contaminated fluids and kits) toward susceptible person. This is commonly referred to the chain of infection (Kali, 2013). Hundreds of millions of patients are affected by health care-associated infections worldwide each year, leading to significant mortality and financial losses for health systems. Where, every 100 hospitalized patients at any given time, 7 in developed and 10 in developing countries will acquire at least one health care-associated infection. At any given time, the prevalence of health care-associated infection in developed countries varies between 3.5% and 12%. While, at any given time, the prevalence of

health care-associated infection varies between 5.7% and 19.1% in low- and middle-income countries (WHO, 2020) .

Maternal infections are an important cause of maternal mortality and severe maternal morbidity. Global estimates suggest that direct (obstetric) infections are the third most common cause of maternal mortality, representing about 10·7% of maternal deaths, with the largest toll estimated in low-income and middle-income countries (LMICs) at 10·7% compared with high-income countries (HICs) at 4·7%. The contribution of infections to maternal deaths could be larger, as these figures do not include deaths due to abortion-related infections or indirect (non-obstetric) infections, which are not a result of, but aggravated by, pregnancy (WHO, 2020). Generally, data for maternal sepsis in LMICs are scarce. The latest estimates on global burden of sepsis suggest that maternal disorders complicated with sepsis reached 5·7 million cases globally in 2017. Data from the 1990s suggested an incidence of 1–2 cases per 1000 livebirths. Studies from the early-2000s, mainly from HICs, reported lower incidences of 0·1–0·6 per 1000 (Rudd *et al.*, 2017).

So, there is an increasing need to conduct such study among the healthcare workers at delivery room and maternal surgical wards because due to the shortage of there is no studies conducted on infection control precautions in delivery room and maternal surgical wards in Iraq.

1.3 Statement of the problem:

Nurses- Midwives' Practices Towards Infection Control Precautions at Wards in Al Najaf Hospitals.

1.4 Objectives of the study are to:

1. Assess the infection control precautions practiced by nurses- midwives working in the maternal surgical wards in Al Najaf – Al Ashraf Hospitals.

3. Find out the relationship between the infection control precautions measures taken by nurses- midwives and their demographic characteristics of .

1.5. Definitions of terms

1.5.1- Infection Control Precautions (ICPs)

A: Theoretical:

Are basic infection control measures essential to reduce hazard of infectious agent transmission from recognized and unrecognized sources of infection (Borlaug G, 2016).

B-Operational:

The standard measures practiced by nurses-midwives practices toward infection control precautions at the obstetric wards in Al Najaf – Al Ashraf Hospitals.

1.5.2. Practices

A: Theoretical:

The process used by researchers, practitioners, and educators to assess the value of a given program, project, or policy (Smith & Ory,2014).

B: Operational:

The process of appraising the infection control precautions by nurses' midwives at the obstetric wards in Al Najaf – Al Ashraf Hospitals.

Chapter Two

Review of Literature

2. Review of Literature

This chapter aims at searching the literatures and studies related to the current study. It includes the following parts:

2.1 Historical Background of Infection Control

In the United States, the first patient admitted to Massachusetts General Hospital in 1821 had diarrhea, extremity pain, and skin ulcers, possibly due to tertiary syphilis. Fifteen Wards were crowded, dirty, and poorly ventilated, and multiple patients still occupied a single bed. At Bellevue Hospital in New York City, care was provided by prisoners or paupers, and there were frequent epidemics. At Blockley Hospital in Philadelphia, nursing duties were performed by inmates. Persons of property or standing generally avoided hospitals and were cared for at home. (Smith *et al.,* 2012).

The 1998, was era of the work of the International Nosocomial Infection Control Consortium (INICC) is a network characterized by an altruistic, nonprofit, open, multicentric health care–associated infection (HAI) surveillance network, which is comprised of an international board of thirty members from high- income and limited-resources countries and >3,000 affiliated infection control professionals (ICPs) from 1,000 hospitals in 500 cities of sixty seven countries from the following six World Health Organization regions: Africa, The INICC is focused on the surveillance and prevention of device associated (DA) HAIs (e.g. central line–associated bloodstream infection pneumonia and urinary tract infection in adult, pediatric, and neonatal intensive care units (ICUs), step-down units, and inpatient wards and surgical site infections (SSIs) on the assessment of compliance with hand hygiene (HH), bundles, improving antimicrobial consumption, and reducing bacterial resistance, length of stay (LOS), mortality, costs, and need lestick injuries (Rosenthal, 2016).

In 1985, largely because of the emergence of HIV/AIDS, guidelines for protecting healthcare workers from becoming infected with HIV and other blood borne infections (e.g., HCV) were quickly developed and became known as Universal Precautions (UP). Almost from the moment they were issued and hospitals and clinics began implementing them, it was recognized that this new strategy, while protecting hospital personnel (patient-to-personnel transmission), sacrificed some measures of preventing patient-to-patient and personnel-to-patient transmission. Also, because many people with blood borne infections such as HIV/AIDS do not have symptoms, nor can they be visibly recognized as being infected, UP had to be modified to include all persons—patients and clients— attending healthcare facilities regardless of whether or not they are infected (McIntosh, 2013).

In 1864, Britain's Chief Medical Officer John Simon underlined the importance of natural ventilation in wards. Like Florence Nightingale, Simon supported oblong wards with sash windows reaching to the top along the two long sides, with sufficient space for one bed between each window (Hobday *et al.*, 2017).

The physician Alexander Gordon had first described puerperal fever in 1795 as a "specific infectious disease" transmitted from one woman to another through the hands of a companion, but his work was ignored until the 1840s, when other scientists independently discovered the same in Vienna .Similarly, James Young Simpson identified puerperal fever and surgery as "transmissible" and coined the term "hospitalization" to describe outbreaks of surgical infections, which he believed were so serious that "...put every patient on the operating table at risk From a soldier entering one of the deadliest and bloodiest battlefields” (Jamrozik and Selgelid, 2020)

In 1914, the British Admiralty recommended that the air change rate on the Royal Navy's ships should be 3000 cubic feet (85 m3) per man per hour. This was also recommended for British housing, By the 1920s, scientific opinion had turned against the airborne transmission of respiratory diseases. Aseptic surgery and barrier nursing had shown the importance of contact in hospital infection (Hobday *et al.*, 2013).

It was thought that respiratory infections were transmitted by large droplets over short distances or through contact with freshly contaminated surfaces; not via the air, or dust. Natural cross-ventilation remained popular in hospitals, however, with open-air management of tuberculosis patients having a direct influence on hospital design (Simons *et al.*, 2017).

There was increased use of recirculated air, particularly in commercial buildings. Air change rates were reduced to save fuel and money. The latter may have contributed towards so-called ‘sick building syndrome’, characterized by a range of symptoms including headache, fatigue, dry eyes and throat, nasal congestion and dry skin (WHO, 2020).

The World Health Organization refers to sunlight in guidance on preventing hospital infections, although reasons for this are not made clear. For airborne infections such as tuberculosis, one document recommends that patients should be placed in single rooms with sunlight, negative air pressure and six to 12 air changes per hour (WHO, 2022).

Guidelines on healthy housing state that natural lighting should be provided for toilets, preferably using special glass that transmits a higher proportion of UV rays. If ordinary window glass is fitted, windows should be left open in warm weather for at least 3 h in order to allow penetration by shorter wavelength UV radiation, presumably to exert some bactericidal effect (WHO, 2021).

In 1877, Downes and Blunt reported that sunlight inhibited the growth of bacteria from behind glass. Later studies showed that sunlight could kill a range of bacteria, including those causing tetanus, typhoid, anthrax and tuberculosis. In 1890, Koch reported that direct sunlight could kill the bacillus in a few minutes, or several hours, through glass. The time depended on the thickness of the layer of bacteria exposed (Tidwell, 2013).

Furthermore, ordinary diffuse daylight, such as is found near windows in houses, could kill the bacterium in five to seven days. Even before this, it was recognized that tuberculosis transmission was less likely to occur in clean, well-lit, well-ventilated houses or hospitals (WHO, 2013).

According to Eickhoff (1969), every hospital is required by the Joint Commission for Accreditation of Hospitals (JCAH) to devote part of its infection control program to infection surveillance. Surveillance methods vary from hospital to hospital and can range from "spot" checks to complete review of every hospitalized patient's record, to review of microbiology laboratory results. When broadly defined, surveillance includes not only systematically gathering and analyzing data, and using consistent definitions, but also disseminating and otherwise using the results of surveillance to reduce infection risks (Littman *et al*, 2020).

Brachman (1979) states in his book, Hospital Infections, that the most important aspect of a nosocomial infection control program is surveillance. Monitoring required to establish basic information about the frequency and type of infection occurring in the hospital, so that several upward deviations from this baseline can be identified, and consists of the following elements: identification of events to be surveyed as briefly and concisely as possible; collect relevant data in a systematic manner; Consolidation or tabulation of collected data into

meaningful arrangements; data analysis and interpretation; and disseminate data and interpretations to those who need to know it (Normile *et al.*, 2020).

Infectious and contagious diseases are of global concern and are the second most common cause of death in flora and fauna. Communicable infectious diseases have threatened and challenged humans throughout history, where observers have recorded the advent of epidemics from epizootic diseases (Haque, 2020).

Before communicable diseases were identified, infections were often attributed to various conditions: asters, environmental changes, acts of God, or spiritual reasons. The notions of transmissible and spreadable diseases emerged first, and those of contagious and infectious diseases emerged much later. In Europe between the 5th and the 15th centuries, contagious diseases had a substantial negative impact on public health (Hewlett, 2012).

In 1980, the Study on the Efficacy of Nosocomial Infection Control (SENIC) demonstrated that surveillance for nosocomial infections and infection control practices that included trained professionals could prevent HAIs. As a result, an important role developed for hospital epidemiologists and infection control practitioners. As medical care has become more complex, antimicrobial resistance and HAIs have increased, as have their attributable morbidity and mortality. Additionally, HAIs increase hospital lengths of stay and health care expenditures (Sydnor *et al.*, 2011).

Many hospitals employ professional, most of them are health care providers (physician, midwife etc.) they are specially trained in infection prevention and control. They are responsible of advising hospital personnel regarding infections in the hospitals (Yallew *et al.*, 2019).

A comparison of the client's response, with the expected outcomes determines the success of health provider interventions similarly; health provider

determines whether interventions should be revised. Health provider closely monitors clients especially those at risk, for signs and symptoms of infection. For example, invasive sites infection. Health provider closely monitors all invasive sites for swelling, purulent drainage. They may determine that clients require new information or that previously instructed information needs reinforcement (Sharma *et al.,* 2020).

2.2. Conceptual Framework

According to Florence Nightingale, the role of the nurse is to place the patient in the best position for nature to act upon him, thus encouraging healing. As Florence Nightingale saw it, nurses and nursing practice were an integral part of daily hospital life. The use of antiseptics helped immensely, with carbolic solutions being considered to be the safest method of disinfection. Several clinicians observed hospital-bound infection in the mid-19th century referred to at the time as ‘hospitalism’, and its high mortality rate as a result of poor sanitation, especially the failure of doctors and nurses to wash their hands prior to treating patients (Gilbert, 2020).

Some theorist emphasized the importance of a clean and sterile environment and ventilation, light, noise, cleanliness of rooms/walls, bed and bedding, personal cleanliness, and taking food. According to Nightingale, if nurses modify patient's environment according to her canons of environment, she can help patient to restore his usual health or bring patient in recovery to speed up the recovery of the patient and remove the bitterness from him and reach an integrated health condition.

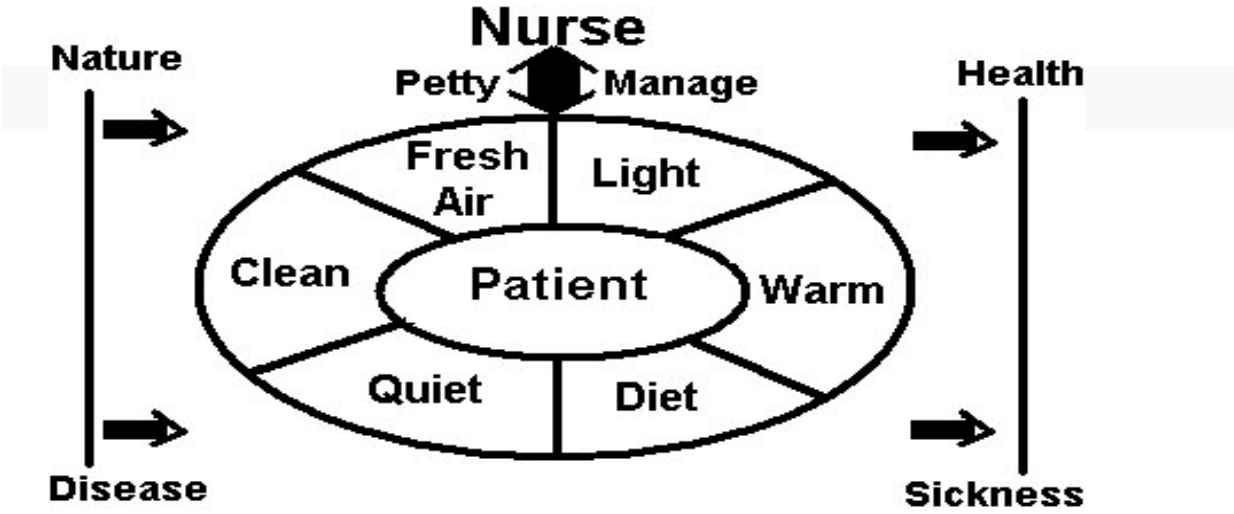

Figure 1.1: Florence Nightingale's conceptual framework on environmental theory (Hegge, 2013; and Gurler, 2014).

2.3. Hospital-acquired infections

The Centers for Disease Control and Prevention (CDC) defines health care-associated infections (HAIs) as infections acquired while in the health care setting (e.g., inpatient hospital admission, hemodialysis unit, or same-day surgery), with a lack of evidence that the infection was present or incubating at the time of entry into the health care setting (CDC, 2015).

In response to patient risks and growing costs, in 2008 the Centers for Medicare and Medicaid Services implemented a strategy of withholding reimbursement for certain HAIs such as catheter-associated urinary tract infections (CA-UTIs) and central line-associated bloodstream infections (CLABSIs) (Now more than ever, institution-specific surveillance driven by hospital epidemiologists and infection perfectionists (IPs) is needed in order to enact early detection and prevention strategies to curtail HAIs (WHO, 2012).

Hospital Acquired Infection are infections that patients get while receiving treatment for medical or surgical conditions and many HAI are preventable.

Modern healthcare employs many types of invasive devices and procedures to treat patients and to help them recover. Infections can be associated with procedures (like episiotomy) and the devices used in medical procedures, such as catheters. HAI are important causes of morbidity and mortality in the worldwide and are associated with a substantial increase in health care costs each year. At any one time, one out of every 25 hospitalized patients are affected by an HAI (Magill, 2014).

Patient care is provided in facilities which range from highly equipped clinics and technologically advanced university hospitals to front-line units with only basic facilities. Despite progress in public health and hospital care, infections continue to develop in hospitalized patients, and may also affect hospital staff. Many factors promote infection among hospitalized patients decreased immunity among patients; the increasing variety of medical. Procedures and invasive techniques creating potential routes of infection; and the transmission of drug-resistant bacteria among crowded hospital populations, where poor infection control practices may facilitate transmission (WHO/CDS, 2022).

2. 4. Chain of Infection

Infection Control recognizes the chain of infection as a model that easily describes how Infection may enter the body, also as it is described below how the chain of infection can be broken to prevent transmission to other contacts infectious agent.

Reservoir is the place where an infectious agent lives and reproduces in such a manner that it can be transmitted. Infectious agents can live in or on people, animals, insects, soil or water. Portal of exit when the infectious agent leaves the reservoir; spread of infection is likely to occur. This includes. Excretions and secretions, non- intact skin (e.g., draining wounds), respiratory

tract e.g., sneezing, coughing and talking, gastrointestinal tract. e.g., vomiting, diarrhea and stool, mucous membranes (eyes, nose, mouth and vagina) (WHO, 2013).

Modes of Transmission. the way that organisms “travel” from the reservoir to a host is known as the mode of transmission. Every form of direct and indirect human contact provides an opportunity for disease-producing organisms to be transmitted. non-intact skin. e.g., broken skin such as bed sores or wounds coming in contact with contaminated material respiratory tract, gastrointestinal tract. e.g., eating contaminated food mucous membranes. e.g., eyes, nose or mouth exposures with infectious agents) (WHO, 2014).

Parenteral (e.g., exposure to a contaminated sharp instrument Susceptible Host: all individuals may be susceptible depending on the exposure and their own general health status. Individuals who have never been exposed to the organism may become ill because they do not have antibodies to protect them (e.g., communicable diseases) through either immunization or previous infection (PPH, 2013).

Infection prevention and control efforts have historically focused on monitoring and preventing HAIs locally; however, HAI prevention has recently become a global priority, which has resulted in an evolution of infection prevention and control (Jordanian nursing students, 2013).

Infection control policies have been established, but HAIs still cannot be prevented because of a lack of control over the implementation of such policies. More than a century and a half ago, Semmelweis demonstrated that hand washing was sufficient to reduce the incidence of nosocomial infections; however, the compliance of health care workers (HCWs) with recommended hand washing practices remains low. A major contributing factor to poor compliance is lack of awareness. Strategies have been adopted at various institutional levels; however,

compliance failure is a root cause for the increased incidence of nosocomial infections (Hart et al., 2013).

2.5. Incidence of Infection

Outbreak of an infectious disease is defined as the occurrence of a disease above the expected level Over the past several years, many countries have experienced serious economic and health consequences due to outbreaks of infectious diseases such as the Middle East Respiratory Syndrome in 2015 and severe acute respiratory syndrome in 2003 (World Health Organization, 2018).

Long-term care facilities (LTCFs) are facing a great need for preparation for infection outbreaks because of an increase in the number of residents with global aging. LTCFs are exposed to the risk of outbreaks owing to several factors. First, older residents in LTCFs are susceptible to infectious diseases because of aging and health conditions and are known to be dependent with regard to activities of daily living (Rainwater *et al.*, 2020).

Thus, among residents, self-hygiene is observed to be poor. Loss of independence in residents creates unique and frequent contact opportunities between healthcare workers (HCWs) and residents. Second, HCWs in LTCFs (long-term care facilities) tend to be poorly informed about infection prevention and control (IPC), and compliance with IPC is generally low, Third, the environment in LTCFs offers challenges for IPC, like the sharing of rooms, group living, and difficulty with the isolation of infected persons. Finally, LTCFs have limited resources and capacities for diagnosis of infection This leads to a delay in the detection of hidden carriers and infection. All these factors contribute to the onset and spread of outbreaks in LTCFs. Outbreaks in LTCFs threaten the life

and health of both residents and HCWs, and thus, eliminating the risk of outbreaks is a matter of concern in such facilities (Lee, 2020).

However, LTCFs vary in their individual capacities to respond to outbreaks. The keys to outbreak control are as follows: identification of the transmission causes and minimization of the spread through early initiation of control measures. Therefore, it is essential to understand the causes of transmission and the applied measures to control outbreaks in LTCFs (World Health Organization, 2017).

Postpartum infection is a leading cause of maternal mortality worldwide. Approximately five million cases of pregnancy-related infection occur every year globally, and approximately 75,000 results in death Infection incidence are higher in low-resource settings, and many infection-related maternal deaths are preventable. Postpartum infections are a subset of maternal infections occurring between delivery and the 42nd day postpartum. The most common postpartum infections include endometritis (puerperal sepsis), urinary tract infections, surgical site infections, blood stream infection and wound infections (Ngonzi *et al.*, 2017).

In a retrospective study from Mbarara Uganda, puerperal sepsis accounted for 31% of maternal deaths, making it the most common cause of maternal mortality at that facility. Most research on postpartum infections has occurred in high resource countries, where risk factors include poor intrapartum hygiene, low socioeconomic status, primiparity, prolonged rupture of membranes, prolonged labor, and having more than five vaginal exams intrapartum. In these settings, cesarean delivery appears to be the single most important risk factor for postpartum infection. In low-resource settings, risk factors for postpartum infection are poorly defined and may differ from high-resource settings due to patient, environmental and healthcare system factors. In addition, most published

studies from low-resource settings do not include microbiological confirmation of infection or infectious outcomes (Miller *et al.*, 2017).

Maternal deaths due to infection occur mainly through maternal sepsis, "a life-threatening condition defined as organ dysfunction resulting from infection during pregnancy, childbirth, post-abortion, or post-partum period". This definition aligns with the recent Sepsis-3 definition for adults and includes both direct and indirect infections. Accurate assessment of the burden of maternal infections and its complications, including sepsis, is challenging given differences in case definitions and the populations studied (Bonet et al., 2017).

The assessment of the burden of maternal and its complication not only predispose women to and aggravate their response to infection, but also complicate its identification and management. Few studies have reported maternal infections across the continuum of pregnancy to post-partum or post-abortion. The Global Burden of Disease study estimated that 11·9 million cases of direct maternal infections occurred in 2017 (Singer et al., 2017).

Generally, data for maternal sepsis in LMICs are scarce. The latest estimates on global burden of sepsis suggest that maternal disorders complicated with sepsis reached 5·7 million cases globally in 2017. Data from the 1990s suggested an incidence of 1–2 cases per 1000 livebirths. Studies from the early-2000s, mainly from HICs, reported lower incidences of 0·1–0·6 per 1000 (Rudd *et al*., 2017).

In one study estimates that Surgical site infection (SSI) is the second most common infectious complication after urinary tract infection following a delivery by caesarean section (CS). At Buganda Medical Centre, there has no study documenting the epidemiology of SSI after CS despite the large number of CSs performed and the relatively common occurrence of SSIs (Mpogoro, 2014).

Other study estimates that bloodstream nosocomial infections are the eighth leading cause of death, assuming a nosocomial infection rate of 5%, of which 10% are bloodstream infections, and an attributable mortality rate of 15%. In absolute numbers, if the overall attack rate was 5% and 25 million patients were admitted each year, 1.75 million people would acquire nosocomial infections each year. If 10% of these were bloodstream infections, 175,000 would get these serious infections each year. If the attributable mortality rate of nosocomial infections is 20% and the infection rate is 5%, an estimated 350,000 life years would be lost annually (CDC, 2012).

It is considered hepatitis B virus (HBV) is a public health problem. Around 500 million subjects are chronically infected with the virus worldwide HBV can be transmitted through blood and blood products, hemodialysis, shared deliveries per year. Infection needles among drug abusers, surgeries and dental procedures. Additionally, the virus can be transmitted sexually and certain sexual behaviors such as homosexuality increased the risk of infection HBV can also be transmitted vertically from mother to new born babies during delivery (MacLachlan et al., 2017).

At the time of writing, COVID-19 has a global CFR of ~6.4% and has caused more deaths than MERS and SARS combined, 1Understandably, this raises concerns regarding its effects during pregnancy. This is because pregnancy is associated with physiological changes in women which make them more susceptible to respiratory infections and subsequent rapid progression to respiratory failure. Moreover, the available evidence, based on expert opinion and case series data, suggests expedited delivery to facilitate a 28% reduction in daily oxygen requirements to facilitate maternal respiratory stabilization during respiratory failure (Warty, 2020).

When placentas of SARS-affected women were examined, worsening histopathological features of hypoxic damage were appreciable with increasing time from symptom onset to delivery of the fetus, (termed time-to-delivery (TTD) henceforth) These factors then raise the additional question of whether there were any potential differences in these outcomes with respect to TTD, given the implications it could have for management and prognosis (Mehta *et al.*, 2020).

Infection prevention and control (IPC) is essential to prevent healthcare-associated infection (HAI) and improve patient safety. Emerging pathogens and epidemics contribute to additional responsibilities that require frequent preparation and advisory efforts as recommendations are constantly evolving. The role of IPC in preventing disease transmission has been emphasized during recent pandemics (Alsuhaibani et al., 2022).

Public awareness is necessary to manage both emotions and behaviors in injury situations. Knowledge of transmission mechanisms, common symptoms, prevention, and self-care strategies is critical to responding to frontline epidemic situations. In response to infectious diseases, health communication becomes more important to educate people about the mechanism of transmission, common symptoms, prevention mechanisms and basic treatment (Naveed and Shaukat, 2022).

Infection control precautions (ICPs)are action practices which applied consistently to achieve a basic level of infection prevention and control that will help to protect physicians, nurses' staff from infection, and helps to prevent infection transmission. So, these precautions should be Taken by the health care staff during patient care or who may have contact with blood or body fluids (including secretions and excretions, but excluding sweat) (RACGP, 2014).

Standard precautions are a set of basic strategies for preventing occupational exposure of employees. Standard precautions for infection control can be improved by enhancing constructs of perceived benefit, perceived susceptibility, perceived self-efficacy, and action signals (Khodisiave et al., 2022).

Continuing to emphasize the importance of patient involvement in infection prevention and control, as a means of improving patient safety remains imperative. Encourage leaders to develop reminders emphasizing the importance of infection prevention and control among nurses and patient and to promote a culture of partnership between them (Hammoud et al., 2022).

Because nosocomial infections (NIs) now concern 5 to 15% of hospitalized patients and can lead to complications in 25 to 33% of those patients admitted to ICUs. The most common causes are pneumonia related to mechanical ventilation, intra-abdominal infections following trauma or surgery, and bacteremia derived from intravascular devices (Eggimann, 2021).

Infection prevention precautions are those specific practical measures, targeted at the practical prevention and control of ventilator-associated pneumonia, sinusitis, and blood stream, urinary tract, and surgical site infections are detailed (Eggimann, 2021).

Recent data strongly confirm that these strategies may only be effective over prolonged periods if they can be integrated into the behavior of all staff members who are involved in patient care. Accordingly, infection control measures are to be viewed as a priority and have to be integrated fully into the continuous process of improvement of the quality of care (Adedeji, 2016) .

Health Care Provider (their prevention and control) are a significant global public health burden about which concerns have been raised from all healthcare stakeholders, including health professionals, patients, and the public. Their

impact has dramatically increased because of the advent of multidrug-resistant pathogenic microorganisms (Esfandiari, 2017).

Currently, almost all available antimicrobials are resistant and very few antimicrobials are in the process of being developed for widespread use. Amongst these pathogens, *Klebsiella pneumonia*, which is the most common resistant pathogen, especially in ICU settings, is a significant concern. In 1980, the study on the Efficacy of Nosocomial Infection Control (SENIC) demonstrated that surveillance for nosocomial infections and infection control practices that included trained professionals could prevent HAIs. As a result, an important role developed for hospital epidemiologists and infection control practitioners As medical care has become more complex, antimicrobial resistance and HAIs have increased, as have their attributable morbidity and mortality). Additionally, HAIs increase hospital lengths of stay and health care expenditures. In response to patient risks and growing costs, in 2008 the Centers for Medicare and Medicaid Services (CMS) implemented a strategy of withholding reimbursement for certain HAIs such as catheter-associated urinary tract infections (CA-UTIs) and central line-associated bloodstream infections (CLABSIs) (WHO, 2013).

Even with advances in the health care system, the threat of hospital-acquired infections (HAIs) remains. The Centers for Disease Control and Prevention (CDC) reported that an estimated 1.7 million infections occur annually in hospitals in the United States (US), with 99,000 associated deaths (Sodhi et al., 2013). 2.8.Standard Precautions

All nurses and midwives in the health care facility with the same basic level of “standard” precautions involves work practices that are essential to provide a high level of protection to patients, health care workers. These include the following: Hand washing and antisepsis (hand hygiene); Use of personal

protective, equipment when handling blood, body substances, excretions and secretions;, Appropriate handling of patient care equipment and soiled linen, Prevention of needle-stick/sharp injuries, Environmental cleaning and Appropriate handling of waste (Acharya et al., 2013)

Infection prevention and control efforts have historically focused on monitoring and preventing HAIs locally; however, HAI prevention has recently become a global priority, which has resulted in an evolution of infection prevention and control (WHO, 2013).

2.6. Infection Control Precautions

Midwives try to prevent and control infection; they have little knowledge of infection prevention and control practice. There is virtually no adherence to infection control precautions including hand hygiene, use of gloves and sharps management as a result of poor knowledge of infection control measures resulting in prolonged hospital stays, functional impairment or reduced quality of life and financial costs for both patients and their families (Okwii, 2017).

According to the World Health Organization, since the outbreak of the Corona epidemic, the importance of personal hygiene and attention to personal protection methods has been emphasized. For workers in the health sector and other sectors where gatherings abound, when mixing with them, dealing with them in different ways, touching them, or touching their needs, infection control has become critical. Recommended (World Health Organization, 2017).

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2.7.1 Hand Hygiene

In the mid-19th Century, several researchers in Europe and the US, including labarraque, Semmelweis, and Wendell Holmes, were working to prevent hospital-acquired, nosocomial HCAIs (Petrelli, 2019)

Hand hygiene practices were slow to become widespread; however, until much later, for example, it was only during the food borne diseases outburst in the US in the 1980s that the Center for Disease Control and Prevention (CDC) recognized HH as a vital technique to stop the widespread infection (WHO, 2015).

Subsequently, the CDC produced and promoted guidelines regarding hand washing practices in hospitals, principally encouraging hand washing with non-antimicrobial soaps both before and after carrying out procedures with the possibility to spread pathogens, especially among high-risk patients, where they could rapidly cause a fatal outcome (Esfandiari, 2017).

Alcohol-based solutions were suggested only in circumstances where a wash-hand basin was not accessible. Another study in 1995 encouraged the use of antimicrobial soap or a waterless antiseptic agent for cleaning hands upon leaving the rooms of patients infected with multidrug-resistant microorganisms (WHO, 2017).

Ensuring patient safety whilst in hospital and other healthcare facilities is a substantial international public health problem with HCAIs being the most common adverse events in any healthcare system in high- and low-income countries. Each year, hundreds of millions of hospitalized patients are affected with HCAIs, causing substantial morbidity, mortality, and financial losses for individuals, communities, and the public healthcare budget (WHO, 2016).

Hand hygiene has been identified as the most important single behavior change that healthcare workers can make for infection control, especially in relation to HCAIs. For example, the strict practice of HH has been reported to reduce nosocomial infections by between 40% to 70%. Despite this, rigorous hand washing strategies in hospitals have been observed to be weak, with multiple by healthcare workers often does not reach over 40% (WHO, 2018).

Non-compliance with the guiding principles of HH is thus a global public health issue which requires more standardized policies, regular monitoring and surveillance, and additional research (WHO, 2019).

The Joint Commission Journal on Quality and Patient Safety reports 24 reasons HCWs cited for their non-compliance with effective HH. Many reasons cited stem from a lack of education or training about the need for strict HH, leading to poor practice around ensuring and promoting HH as a key priority and a lack of understanding of how to maintain personal and patient safety (Shabot *et al.*, 2016).

Some HCWs thought that wearing sterile gloves meant that HH was unnecessary or that their hospital management's requirements for HH were too extreme. this view was compounded by many hospitals lacking data and evidence about the impact of HH on infection rates. The high workload was cited as a key factor, with HCWs feeling overworked and burnt out and reporting a perceived lack of time to wash their hands properly or change their gloves

between rooms/patients. HCWs also felt that in some clinical situations, such as emergency situations, HH could not be carried out properly, and specific issues were reported relating to gloving and gowning in isolation areas. logistics and room design were reported as impacting non-compliance, for example, an inappropriate or troublesome location of a hand rub slot machine or basin; broken hand washing facilities, including lack of hand rub or cleanser or that the supplied cleansing agent caused irritation or allergy (Chassin, 2015).

Cross-infection leading to no compliance with routine hand washing to stop the spread of cross-infection. the movement of colleagues and relatives between rooms, sharing of equipment, and lack of places to work or put equipment and paperwork were also cited as logistical problems leading to non-compliance with routine hand washing to stop the spread of cross-infection (Chassin, 2013).

Health managers and administrative staff should provide an appraisal of and feedback on HCWs' HH practice with real-time performance data. Hospital authorities should regularly arrange necessary training programs and must acknowledge and reward hospital staff for achieving the targets. No one excused means that from the most senior to the most junior of all hospital staff, all are similarly accountable and responsible for appropriate HH hygiene.Hospital authorities should recognize HH as of paramount importance in maintaining patient care and safety, and every staff member must follow HH guidelines. Data-driven HH policy requires strict and routine monitoring and recording of compliance, with the data, gathered being analyzed to identify and prioritize areas for development and enhancement. (Becker, 2019)

Additionally, research should be continued to develop new ideas to resolve issues in implementing the best HH practice. Systems mean that HH responsiveness is a system-wide effort with rules and regulations regarding HH being applied throughout the health system. Authorities must provide all

necessary logistic support to enable all workers to utilize, adhere to, and promote appropriate HH practice (Keizer *et al.*, 2019).

Ensuring staff have easy access to HH facilities and using technologies to remind all workers to practice proper HH, emphasizing the benefits not only for patients but also for HCWs themselves (Becker *et al.*, 2021).

One recent systematic review comprising 14 articles concluded that a range of strategic methods is needed to raise HCWs' compliance regarding HH to an adequate level, but implementing all these might not be possible. The interventions suggested included educational programs, monitoring, and feedback, ensuring logistics support, improving access to HH agents, and administrative support (Srigley, 2014).

Another systematic review concluded that electronic and video monitoring systems could be very effective in enhancing HH practice and preventing or controlling HCAIs. However, such methods are costly and may not be affordable for many hospitals, especially in low- and middle-income countries (LMICs). Besides, health professionals might not welcome such round the clock monitoring of their practice, and this could lead to strained professional relationships (Luangasanatip, 2015).

In 2005, the WHO and World Alliance for Patient Safety started a movement, the First Global Patient Safety Challenge – "Clean Care is Safer Care" – aimed at improving HH in the healthcare system. This campaign, known as WHO-5, encourages a multimodal plan comprising five different elements: "system change, training and education, observation and feedback, reminders in the hospital, and a hospital safety climate" (WHO, 2020).

Currently, further strategies have been added based on behavioral sciences. A systematic review and meta-analysis found that using the WHO-5 approach improved adherence to HH guidance among HCWs. This study also

suggests that hospital authorities should clearly set out their desired targets, those HCWs who meet the targets should be rewarded with financial incentives, and all HCWs, whatever their position, must be accountable. Such strategies lead to further improvements in HH practice (WHO, 2022).

To support compliance with hand hygiene in the workplace. Health care workers should meet the following standards while working; keep nails short clean and polish free, avoid wearing wrist watches and jewelry, avoid wearing rings with ridges or stones (a plain wedding band is usually acceptable but refer to local policies), do not wear artificial nails or nail extensions. Cover any cuts and abrasions with a waterproof dressing and wear short sleeves or roll up sleeves prior to hand hygiene (refer to local dress code or uniform policies). (RCN, 2012).

Wet hands transfer microorganisms more effectively than dry ones, and inadequately dried hands can be prone to developing skin damage. Disposable paper hand towels should be used to ensure hands are dried thoroughly. Fabric towels are not suitable for use in health care facilities as these quickly become contaminated with microorganisms. Disposable hand towels should be conveniently placed in wall-mounted dispensers close to hand washing facilities. Hand cream should be provided to help staff maintain their hands in good condition. communal tubs of hand cream should be avoided due to the contamination potential. Pump or wall mounted dispensers are preferred, with individual dispensers or tubes in community settings. Referring to further information on hand care and occupational dermas is seeing the staff perform hand hygiene is often perceived as a measure of confidence of overall hygiene by patients and their careers and in recent years the right for patients to ask the staff if they have cleaned their hands has received increased attention. (RCN, 2012).

Improving hand hygiene contributes significantly to the reduction of health-care associated infection, evidence suggests that many health care professionals, including nursing staff, do not perform hand hygiene as often as is required or use the correct technique (Ellingson *et al.*, 2014).

Health care workers have the greatest potential to spread micro-organisms that may result in infection due to the number of times they have contact with patients or the patient environment. Hands are therefore a very efficient vehicle for transferring microorganisms (Marra *et al.*, 2014).

Hand hygiene can be undertaken using soap and water or hand sanitizers, namely alcohol hand gels. Alcohol hand gels provide efficient and effective way of disinfecting hands and are actively promoted by health and social care organizations and as part of the World Health Organization's (WHO) five moments for hand hygiene. (WHO, 2010).

It is important to recognize that the hands of health care staff will always carry bacteria, their own bacteria or those that have attached because of activities (handling equipment, touching surfaces or patients). Although it is not possible to 'sterilize' hands, the number of bacteria present can be reduced significantly through good hand hygiene practice. While it is not possible to perform hand hygiene on every occasion during the working day or night, there are a number of occasions when hand hygiene is specifically recommended to guide staff in best practice (WHO, 2014).

A number of frameworks exist to guide the staff decision-making on when to perform hand hygiene, including the World Health Organization's (WHO) five moments for hand hygiene, it is therefore important that staff understand when to perform hand hygiene in different care settings. Situations that pose the greatest risks include, but are not limited to: Before patient contact, before contact with a

susceptible patient site (such as an invasive device or wound) before an aseptic task, after exposure to body fluids (blood, vomit, faces, urine and so on)after glove removal, after patient contact, after contact with the patient's immediate environment. Alcohol hand rubs provide an effective and convenient alternative to hand washing with soap and water be used in both health and social care settings to support staff with hand hygiene. While very effective as destroying micro-organisms on 'socially clean hands', these are not effective in all circumstances. (WHO, 2021).

2. 7.2 Principles for use of Personal Protective Equipment

It is important that to use the personal protective equipment effectively, correctly, and at all times where contact with blood and body fluids of patients may occur. Continuous availability of personal protective equipment and adequate training for its proper use are essential. Staff must also be aware that use of personal protective equipment does not replace the need to follow basic infection control measures such as hand hygiene (Sehulster and Chinn, 2020).

Personal protective equipment should be chosen according to the risk of exposure. The health care worker should assess whether they are at risk of exposure to blood, body fluids, excretions or secretions and choose their items of personal protective equipment according to this risk. Avoid any contact between contaminated (used) personal protective equipment and surfaces, clothing or people outside the patient care area. On the other hand, as the policy of the hospital; personal protective equipment must discard in appropriate disposal bags without sharing with another person and personal protective equipment must be changed completely thoroughly wash hands each time leave a patient to attend to another patient or another duty. (WHO, 2014).

2. 7.2. 1 Gloves

Gloves should worn whenever contact with blood and body fluids, mucous membranes or non-intact skin may occur, but should not be considered a substitute for hand hygiene. Hand hygiene must always be performed after the removal of gloves. Gloves should be put on immediately before the task is to be performed, then removed and discarded as soon as that procedure is completed. Gloves should never be worn 'just in case' as part of routine nursing care gloves are not required for routine health care activities as taking blood pressure, bathing and dressing patient. Compliance with hand hygiene should always be the first consideration. Indiscriminate or improper glove use has been linked to transmission of pathogens gloves have specific task and single-use for any task. Re-use of gloves has been associated with transmission of methicillin-resistant Staphylococcus aureus (MRSA) and Gram-negative bacilli (WHO, 2013).

There are three types of gloves used in healthcare facilities: surgical examination and utility or heavy-duty household gloves:

Surgical gloves should be used when performing invasive medical or surgical procedures. Involving contact with tissue deep under the skin (e.g. Cesarean Section or episiotomy) , Examination gloves provide protection to healthcare workers use for contact with mucous membranes and non-intact skin (e.g., pelvic examination)., Utility or heavy-duty household gloves should be worn for processing instruments, equipment and other items; for handling and disposing of contaminated waste; and when cleaning contaminated surfaces. (Tietjen, 2010).

Because gloves are not completely free of leaks and hands may become contaminated when removing gloves Hands must be cleaned before putting on gloves for an aseptic clean procedure and after glove removal. Gloves must be removed immediately and discarded into a waste receptacle after the activity for which they were used and before exiting a client/patient/resident environment (WHO, 2018).

2. 7.2. 2 Gowns and Disposable Plastics Aprons

Wear a gown (clean, non-sterile) to protect the skin and prevent soiling of clothing during procedures that are likely to generate splashes of blood, body fluids secretions or excretions. Impermeable gowns are preferable. Remove a soiled or wet gown as soon as possible. A plastic apron may be worn on top of the gown to protect exposure to blood, body fluids, secretions and excretions. Launder gowns and aprons appropriately, if they are reusable, according to the hospital guidelines. (WHO, 2014)

Aprons/gowns should be changed between patient's procedures. It may be necessary to change aprons/gowns between tasks on the same patient to prevent unnecessary cross contamination. Remove aprons/gowns immediately once a task is finished.

Never wear them while moving to a different patient area torn or otherwise damaged aprons/gowns should not be used and should be removed immediately (safety permitting) if this occurs during a procedure. (HPA, 2019).

2. 7.2.3 Face Masks

Wear a mask to protect mucous membranes of the mouth and nose when undertaking procedures that are likely to generate splashes of blood, body fluids, secretions or excretions. (WHO, 2020).

Wear surgical masks rather than cotton material or gauze masks. Surgical masks have been designed to resist fluids to varying degrees depending on the design of the material in the mask, do not reuse disposable masks. They should be disposed of according to the health care facility protocol. (WHO, 2011).

2. 7.2.4. Caps and Boots/Shoe Covers

Wearing caps and boots/shoe covers where there is a likelihood the patient's blood, body fluids, secretions or excretions may splash, spill or leak onto the hair or shoes. Caps and shoe cover appropriately, if they are reusable, according to the hospital guidelines. Do not reuse disposable caps/shoe covers, they should be discarded according to the health care facility protocol, Clean and disinfect reusable boots. (WHO, 2020).

2.8. Waste Management

The percentage of non-hazardous waste generally amounts to 85% of the total amount of waste from health care activities. The remaining 15% are considered hazardous materials that can transmit infection, be toxic, or be radioactive. It is estimated that about 16 billion injections are given each year worldwide, but not all syringes and needles are disposed of properly after use.

Health care waste is sometimes incinerated, and this incineration may produce emissions in the form of dioxins, furans, and other toxic air pollutants. Health care activities protect and restore health and save lives. Of the total amount of waste from health care activities, the percentage of general non-hazardous waste is 85%, compared to household waste. The remaining 15% are considered hazardous materials that can transmit infection, be toxic or radioactive. (WHO, 2020)

2.8.1. Types of waste

Infectious waste: waste contaminated with blood and other bodily fluids (such as waste from discarded diagnostic samples), culture and stocks of infectious agents left over from laboratory work (such as waste from morgues and infected animals, resulting from laboratory work), or waste from patients in isolation wards and equipment (such as Swab, bandage and disposable medical

Pathological waste: human tissues, organs or fluids, body parts and contaminated animal carcasses; Sharp objects: syringes, needles, scalpels, disposable blades, etc.; Chemicals: such as solvents used in laboratory formulations, disinfectants, heavy metals in medical equipment (such as mercury in broken thermometers) and batteries; Pharmaceuticals: expired, unused and contaminated drugs and vaccines; Genotoxic wastes: highly hazardous, mutagenic, teratogenic,

or carcinogenic wastes, such as cytotoxic drugs used to treat cancer, and their metabolites; Radioactive waste: such as products contaminated with radionuclides, including radioactive diagnostic materials or materials used in radiotherapy; Non-hazardous or general waste: waste that does not pose any special biological, chemical, radiological, or physical danger.(WHO, 2019)

2.8.2. Health risks

Healthcare waste contains potentially harmful microorganisms that can infect hospital patients, health workers and the general public. Other potential risks may include the spread of drug-resistant microorganisms from healthcare facilities into the environment. Health risks related to waste and by-products also include: Burns caused by exposure to radiation; Injuries caused by sharp objects; Poisoning and contamination by the action of pharmaceutical preparations, especially antibiotics and cytotoxic drugs; Poisoning and pollution by wastewater; And with elements or compounds such as mercury or dioxins that are released during the burning of waste. (WHO, 2021)

2.8.3. Waste related to sharp objects

The rate of injections with contaminated needles and syringes in low- and middle-income countries has declined significantly in recent years, partly due to efforts to reduce the reuse of injection equipment. The risk of infection for a person who gets a single cut from a needle previously used by an infected patient is 30% if it is hepatitis B virus infection, 1.8% if it is hepatitis C virus infection, and 0.3% if it is HIV infection. 2,3,4

Additional risks arise from cleaning waste disposal sites and during manual sorting of hazardous waste in healthcare facilities. This practice is common in many regions of the world, especially in low- and middle-income countries. Waste handlers are exposed to direct risks of needle wounds and are exposed to toxic or infectious materials. (WHO, 2022)

2.9. Environmental Hygiene

Maintaining strict environmental hygiene is an essential component of preventing and controlling infections, especially in HCAIs. Infected and polluted hospital surfaces act as a key reservoir and source of transmission of life-threatening microorganisms, which include Clostridium difficult (Brian, 2015).

Antibiotic- resistant organisms such as methicillin-resistant Staphylococcus aureus (MRSA), and vancomycin-resistant enterococci (VRE). Hospital surfaces, including both porous surfaces, e.g., beds, mattresses and linen, and nonporous surfaces, e.g., bed rails, door handles, call bells, and light switches are incredibly prone to microbial contamination with high-risk microbes. Maintaining strict hygiene throughout hospitals is, therefore, essential in reducing HCAIs (Yousif, 2016).

The aim of such environmental hygiene is to minimize the number of contagious microorganisms that commonly exist on surfaces, as the reduction of pathogens reduces the possibility of the transfer of infectious germs from object to person, thus reducing cross-infection. Hospital cleaning is a complex and multi-layered process which involves the physical removal (utilizing detergents, chemical disinfectants, and water) of contagious and infectious material from all types of surfaces, including sputum, urine, blood, secretions, excretions,

microorganisms and dust, that can nourish the growth of microorganisms (Elbur et al., 2013) .

The US Center for Disease Control and Prevention (CDC) and the Healthcare Infection Control Practices Advisory Committee endorses that infection prevention and control is the most urgent and vital issue wherever medical care is provided to individuals or communities, irrespective of the type or size of the organization and the healthcare provided (Sehulster, 2019).

Appropriate safety measures should include a routine, deep cleaning of all areas of the hospital, both in-patient and out-patient, to minimize communicable transmission infectious diseases. Antimicrobials used for hospital cleaning comprise both single or multiple components aimed to extinguish or arrest the growth of infectious disease-producing microorganisms, including bacteria, viruses, or fungi (Querido et al., 2019).

Hospital cleansing products may contain about 275 different constituents and are available in various formulations such as sprays, liquids, concentrated powders, and gases. It is crucial for users to understand the level and type of cleaning, its purpose, and limitations, including the various terms, definitions, and classification used (e.g., sterilization, disinfection, cleaning) and the categorization of devices and surfaces that require specific measures. Ethylene oxide gas is used for sterilization, which aims to kill all microorganisms. Disinfection can eliminate nearly all metabolically active microorganisms except for all microbial spores Hydrogen peroxide (7.5%) is a common agent utilized for high-level disinfection. Isopropyl alcohols with a concentration of 70–90% can provide intermediate-level disinfection by the

eradication of all vegetative microorganisms with a small number of bacterial spores. (United States Environmental Protection Agency, 2019).

A quaternary ammonium microbial detergent solution can achieve low-level disinfection by eradicating most metabolically active bacteria, some fungi, and viruses but not metabolically inactive spores. Cleaning is described as the removal of soil, dust, earth, or biological pollution from an instrument or hospital physical surface through brushing, scrubbing or scraping, using detergent, the surfactant or emulsifying agents that reduce surface tension, and water (Cabral, et al., 2019).

Cleaning eliminates many contagious microbes from hospital surfaces, thereby reducing the bacterial load on surfaces. Cleaning is, therefore, the first stage of maintaining hospital hygiene, particularly for surfaces having evident pollution, and helps to safeguard the success of subsequent disinfection procedures (Querido, et al., 2019). aste management is an important current issue for societies. Sectors as varied as cities, manufacturing, and service industries face waste management challenges, and the issue has intensified due to significant population growth, urbanization, and consumerism (Zhang et al., 2019, Paul and Ghosh, 2022). Concurrent with the increase in waste management challenges, smart waste management (SWM) strategies are being developed through the application of intelligent and novel technological tools (Sharma et al., 2020a; Lin et al., 2022).

2.9.1 Standards of Environmental Services

In the environmental services infection control should contain details of preventive measures the procedures should follow those set forth by the CDC, which is related to cleaning and disinfectant surfaces of environment; cleaning

spill of blood and body fluids, the cleaning and maintenance laundry and bedding, cloth furnishing and handling of medical waste. (Van *et al.*, 2020).

A dirty or contaminated clinical environment is one of the factors that may contribute to HCAIs. Exposure to environmental contamination with spores of C. difficile is one example of occasions when the environment contributes to the development of infection. Many microorganism scan be identified from patients' environments and these usually reflect bacteria carried by patients or staff (in the case of S. aureus). Contact with the immediate patient or a contaminated environment by the hands of staff can also be a route for transmission of microorganisms (MHRA, 2014).

2.9.2 Cleaning of the Environment

Cleaning removes contaminants, including dust and soil, large numbers of microorganisms, and the organic matter that may shield them – for example, biofilms, blood and other bodily fluids. Cleanliness applies to the inanimate environment as well as equipment, fixtures and fittings. A number of different methods are available for cleaning, which include traditional cleaning with cloths and detergent or microfiber technology, Additional technologies are also available for specialist use after outbreaks of infection or as part of a routine environmental decontamination programed, for example, hydrogen peroxide vapor (RCN, 2015).

Ninety percent of microorganisms are present within visible dirt, which should be eliminated by routine cleaning. Neither ordinary soap nor detergents have antimicrobial activity, and the cleaning process depends essentially on mechanical action. Wet mopping with hot water and detergent, if available, is recommended, rather than sweeping (Boyce et al., 2016).

If hot water is not available, a 0.2 % chlorine solution, or other suitable disinfectant in cold water should be used. However, detergent is sufficient for

normal, domestic cleaning of floors and other surfaces that are not in contact with hands and medical instruments (Mitchell *et al.*, 2018).

Floors and other washed surfaces should be made of a suitable, non-porous material that resist re-cleaning with hot water and detergents or disinfectants in the case of operating suites and delivery rooms, a 0.2 % chlorine solution or other disinfectant should be used for cleaning floors, walls and beds daily and whenever soiled. Soiled clothing and bedding should be disinfected in 0.2 % chlorine solution for 10 minutes and then rinsed, before being washed and dried as usual, Chlorine solution (1%) is adequate for cleaning and disinfecting blood or body fluid spills (Quinn *et al.*, 2015).

Large spills should first be removed with absorbent material before disinfecting and cleaning. Soiled linen should not be sorted in patient-care areas, and should be handled with minimum agitation to avoid releasing pathogens. Soiled linen should be cleaned and autoclaved before being supplied to operating rooms or theatres (Kanchan *et al.*, 2018).

Environmental cleaning in the health care facility should be performed on a routine and consistent basis to provide a safe and sanitary environment) Cleaning staff require education and training that includes clear messaging regarding their role in the prevention of infections in their health care setting. Cleaning practices in the health care setting must audited and results reported appropriately (PIDAC, 2013).

Frequent audits of practice must be included, as part of the organization's responsibility to maintaining a clean environment, health care settings must review their cleaning and disinfection methods to ensure that they are adequate for disinfection of contaminated surfaces. Cleaning and disinfecting products used in the health care setting (WHO, 2020).

2.9.3. Following Patient Safety

Policies, guidelines, and checklists are an essential part of improving patient safety; however, these are often interpreted and implemented differently by individuals, departments, and organizations, based on local influences and practices and often not taken behavioral science into account. Low found when investigation on the failure of in HCAls levels of physician engagement and compliance with guidelines and policies (McInnes, 2014).

Even in healthcare facilities where policies, guidelines, and checklists were effectively implemented, doctors and other health professionals' practices were found to degrade after around one year. The reasons given included: too much information being provided; guidelines being too complicated to implement; that guideline conflicted with other guidelines, and because little evidence was provided to support the guidance (Gerber, 2014).

All healthcare policies and planning around patient safety must embed the prevention and control of HCAIs as a fundamental principle. the control and prevention of HCAIs is best achieved through a broad, integrated approach and cooperation between healthcare facilities, public health authorities, health insurances, quality management, and patient safety organizations, educational facilities, the public, and the veterinarian sector. Another study regarding the improvement of patient safety identified that the following measures helped to optimize the impact of a program: ensure that the educational program is introduced well and certified; report the program outcomes publicly; carefully design healthcare settings with patient safety in mind; promote an informed and transparent managerial approach; provide clear guidance and role modeling; facilitate collaboration between the healthcare program and government health institution; reduce hospital overcapacity; ensure accountability, and provide financial support (Jeeva, 2014).

2.9.4 Polices and Program of Infection Control

Advanced infection control programs first began in the 1950s in England, where the primary focus of these programs was to prevent and control hospital-acquired staphylococcal outbreaks. In 1968, the American hospital association published "Infection Control in the Hospital," the first and only standards available for many years. At the same time, the Communicable Disease Center, later to be renamed the Centers for Disease Control and Prevention (CDC) began the first training courses specifically about infection control and surveillance (Brusaferro, *et al.*, 2015).

In 1969, the Joint Commission for accreditation of hospitals--later to become the Joint commission on Accreditation of Healthcare Organizations (JCAHO)--first required hospitals to have organized infection control committees and isolation facilities. In the 1970s, infection control underwent a growth spurt. In 1970, fewer than 10% of US hospitals had an infection control program. By 1976, more than 50% of US hospitals had a version of an infection control program, including trained nurses to perform active surveillance. In 1972, the Hospital Infections Branch at the CDC was formed and the Association for Practitioners in Infection Control was organized. By the close of the decade, the first CDC guidelines were written to answer frequently asked questions and establish consistent practice (Ariza et al., 2018).

In 2012 ministry of health in Iraq, put guidelines aim to provide administrators and healthcare workers in Iraq with the knowledge and tools they need to effectively implement infection control. The guidelines apply to all healthcare facilities, from primary health care centers to referral hospitals, and they address all aspects of the infection control program including healthcare waste management. These guidelines should help Directorates of Health to strengthen their infection control practices in health care facilities (MOH, 2012).

Guidelines for the sterilization and disinfection of invasive devices and medical instruments used for surgeries were developed as the infection rates tend to raise (Rutala, 2013).

Lack of compliance with the guidelines, leads to the transmission of nosocomial infections. CDC provides the methodology for surveillance of nosocomial infections along with investigation of major outbreaks. Infection prevention and control guidelines have been developed, but the implementation is not yet much known. So, training of healthcare professionals, especially nurses, is extremely important for the control and prevention of infection (Brusaferro, *et al.*, 2015).

2.10. Purpose of Infection Control Committee

The committee's purpose is to ratify the ideas of the infection control team and to disseminate infection control information. The committee provides a political support that empowers the infection control team to implement infection control policies. Helps the hospital in fulfilling the duty of providing a safe environment for the patients (Talbot et al., 2013).

The role of the Infection Control Committee is very multi-faceted. It should be involved in planning, monitoring, evaluating, updating, and educating. It sets general infection control policy and provides input into specific infection control issues. Simply stated, its function is to prevent and control (AL-Essa *et al.*, 2013).

Members of committee should be a staff from variety department. Might include some or all of the following (infection control nurse, nurse, doctor, midwife or doctor working in obstetrics and delivery room staff) responsible for sterilizations, Nosocomial infection control that is accomplished in a variety ways some of which include: surveillance of nosocomial infections, product evaluation, investigation of infection outbreaks and infection clusters,

development of infection control procedures for all departments, staff and patient education, medical waste management, everyone knows that infection control is the responsibility of all healthcare workers. Patients and employees are only safe from infectious processes when everyone follows good infection control techniques (Al-Rawajfah, *et. al.,* 2013).

2.11. Role of Health Personnel in Infection Control

Many hospitals employ professional, most of them are health care providers (physician, midwife etc.) they are specially trained in infection prevention and control. They are responsible of advising hospital personnel regarding infections in the hospitals (Yallew, *et al.,* 2019).

A comparison of the client's response, with the expected outcomes determines the success of health provider interventions similarly; health provider determines whether interventions should be revised. Health provider closely monitors clients especially those at risk, for signs and symptoms of infection. For example, invasive sites infection. Health provider closely monitors all invasive sites for swelling, purulent drainage. They may determine that clients require new information or that previously instructed information needs reinforcement (Sharma et al., 2020).

Limited data are available on the experience of staff implementing infection prevention strategies at facility level in LMICs, and understanding these experiences may help understand limitations to current IPC improvement programmers and identify opportunities for improvement. This study aimed to examine barriers and opportunities that HCF staff face when following IPC protocols in high-volume HCFs in two states in Nigeria (Tirivanhu, *et al.,* 2019).

Prevention the spread of infection requires an understanding of the usual route of transmission of the organisms. Health provider sever an important role in preventing organism's transmission in two ways. First, as the health professionals

who often spend the most time with patient. Health provider have greater opportunity to spread organisms. It is imperative that (midwife, physician …) disinfect their hands before and after contact with patients and after performing a potentially hand contaminating activity. Hand must be disinfected after each time gloves are removed. The second way that the health care provider (nurse, midwife, etc.) utilized aseptic techniques to halt the spread of microorganisms and limit threat of infection (Savard, et al., 2013).

2.12. Infection Control and Prevention in the Maternal Surgical Wards

Approximately 140 million births occur every year. The majority of these are vaginal births among pregnant women with no identified risk factors for complications, either for themselves or their babies, at the onset of labor. However, in situations where complications arise during labor, the risk of serious morbidity and death increases for both the woman and baby. Over a third of maternal deaths and a substantial proportion of pregnancy-related life-threatening conditions are attributed to complications that arise during labor, childbirth or the immediate postpartum period, often as a result of hemorrhage, obstructed labor or sepsis. Similarly, approximately half of all stillbirths and a quarter of neonatal deaths result from complications during labor and childbirth. The burden of maternal and perinatal deaths is disproportionately higher in low- and middle-income countries compared to high-income countries. Therefore, improving the quality of care around the time of birth has been identified as the most impactful strategy for reducing stillbirths, maternal and newborn deaths, compared with antenatal or postpartum care strategies (World Health Organization, 2018).

Bacterial infections during labor and the puerperium are among the leading causes of maternal mortality worldwide, accounting for about one tenth of the

global burden of maternal deaths. While the number of deaths arising from these infections has decreased considerably in high-income settings, the situation has not improved in resource-limited settings. Most of the estimated 75,000 maternal deaths occurring worldwide yearly as a result of infections are recorded in low-income countries. Although the reported incidence in high-income countries is relatively low (between 0.1 and 0.6 per 1000 births), it is nonetheless an important direct cause of maternal mortality (WHO, 2015).

Cesarean section (CS) delivery is one of the most common operative procedures performed in SSA, accounting for as much as 80% of the surgical workload.2,3 In contrast to CS performed in high-income countries, CSs performed in SSA are primarily emergency operations and accompanied by high morbidity and mortality rates.4 This operation is the most important known variable associated with an increased probability of postpartum bacterial infection when compared with vaginal birth, with reported rates of infection ranging from 1% to 25%, about 5 to 20 times higher than that of vaginal delivery.5 In addition to the physical consequences associated with postpartum bacterial infection, such as maternal infirmity and neonatal mortality, these infections often share a common pathophysiological pathway with fetal and neonatal infections and death, thereby contributing to the significant social costs stemming from maternal illness (Sway, 2019).

Identifiable risk factors, and prophylactic measures for infection with the most common methods of induced abortion: suction dilation and curettage (D&C), dilation and evacuation (D&E), and early medical abortion. The microbiology and epidemiology are similar to this group of procedures, as the vagina and cervix are the portals through which all are performed. However, the majority of data come from studies of suction D&C procedures since first trimester surgical abortions are the most common method of induced abortion.

Induced abortion is one of the most common surgical procedures in the United States with over 1.3 million performed in 2003. Abortion rate is 16–21 per 1000 women. Nearly half of all women have faced an unintended pregnancy, and approximately one-third of women have had an induced abortion. The rate of upper genital tract infection after induced abortion, regardless of method, is generally very low, less than 1% in most clinical settings in the United States. Nevertheless, because abortion is so common, small improvements in post-procedural infection rates can have profound impacts on the absolute number of post-procedure infections. Although death associated with legally induced abortion is also rare (overall 0.7 per 100,000 procedures), approximately 30% of abortion-related deaths are attributable to infection. In procedures that access the endometrial cavity through the cervix, some bacterial contamination is inevitable (Achilles, 2011).

Use of standard infection prevention and hygiene measures is a core concept for the prevention of infection transmission in health care settings. Standard infection prevention practices recommended during delivery care are aimed not only at preventing maternal and neonatal infection, but also infection of the health worker, other workers and the public. Adherence to infection prevention practices was assessed against a set of standard measures that are proven to be effective, including hand washing practices, use of personal protective barriers, instrument processing starting with decontamination of reusable items in 0.5% chlorine solution, and disposal of contaminated items into appropriate containers (Plotkin et al., 2011).

2.13 Infection control and prevention during delivery:

infection prevention and control have three primary objectives: to prevent major infections when providing services; to minimize the risk of transmitting serious diseases such as hepatitis B and HIV/AIDS to the women and to health

care providers and staff, including cleaning and housekeeping personnel and to protect the environment by properly disposing of medical waste. The recommended infection prevention and control practices are based on the following principles: - Consider every person (woman or staff) as potentially infectious, Handwashing is the most practical procedure for preventing cross-contamination, Wear gloves before touching anything wet broken skin, mucous membranes, blood or other body fluids, use barriers (e.g. protective goggles, face masks or aprons) if splashes and spills of any body fluids are anticipated and use safe work practices such as not recapping or bending needles, proper instrument processing, and proper disposal of medical waste (Mathai et al., 2017).

Within the measures for infection control the woman is isolated in a single room with ensuite facilities to reduce the risk of transmission of infection, healthcare workers wear personal protective equipment including disposable gloves and aprons when in contact with the woman, equipment and their immediate surroundings, breaks in the skin of the woman or career must be covered with a waterproof dressing, fluid-repellent surgical masks with visors must be used at operative debridement /change of dressings of Group A Streptococcus necrotizing fasciitis and for other procedures where droplet spread is possible and visitors should be offered suitable information and relevant personal protective equipment while the woman is isolated (Lazzerini *et al.*, 2014).

2.14. Preparing sites for surgical incisions and urinary catheter insertion:

For preparing for urinary catheter insertion, catheters should be sterile and a closed system should be put in place in a sterile catheter collection bag in order to prevent organisms from entering the system to infect the bladder or urinary tract. Systems with a port for collection of urine specimens should be used, it is necessary to have minimal portals of entry for microorganisms, especially since patients who require invasive devices are often already susceptible. If they must be inserted, they should be in place for the minimal amount of time (Golwalla *et al.*, 2017).

In Preparation of the cervix and vagina and perineum for manual vacuum dilation and curettage apply a liberal amount of an appropriate antiseptic to the cervix and vagina before instrumentation of the uterus, Place dry, sterile cotton balls or gauze sponges in a solution cup, or gallipot, filled with antiseptic. Insert a vaginal speculum (bivalve or two single valves) to visualize and stabilize the cervix. Pick up a soaked cotton ball or sponge with sterile forceps. In the sequential manner described for skin preparation, wipe the cervix first, and then progress in a spiral fashion along the vaginal walls to the entrance to the vagina. Repeat at least once, preferably two times, using a new antiseptic-soaked cotton ball or sponge each time. For spontaneous vaginal delivery the perineum should be washed by clinic staff with soap and water beforehand. The perineum should not be shaved; the hair may be clipped, if it interferes with the procedure. For forceps delivery it is common practice to apply the antiseptic to an area up to the symphysis and out onto the proximal thighs. Episiotomy is where the midwife makes a cut on the perineum at the time of the birth of baby. This helps the

vaginal opening to become wider, allowing more space to help deliver baby (Measures *et al.,* 2009)

2.15 Hygiene of perineum after delivery

Shower or bath at least once a day and change sanitary pads frequently (every 2-4 hours), ensure wash hands before and after going to the toilet, to prevent any spread of infection to perineal wound, should clean the perineum with lukewarm water each time use the toilet. Can use a jug to pour water over perineum while sitting on the toilet. Some women prefer to use the shower attachment or a bidet. Dry the area carefully using an ordinary towel or dry flannel, keep a special towel for this area and change it daily. Could use a disposable cloth or a sanitary towel to dry instead and bathe in clean water - avoid adding soap, salt or disinfectants to the water. Loose clothing should be worn and tight trousers avoided until the perineum is fully healed (Service, 2018).

Failure to comply with the infection prevention and control policies and guidelines may result in increased morbidity and mortality, litigation against the Ministry of Health, the health care facility, or the individual health worker for damages suffered by patients and/or their families, disciplinary action by professional councils or regulatory bodies against individuals in cases where their proven negligence caused harm to patients, loss of public confidence in the health institution in question, loss of revenue, non-credentialing by the National Health Insurance Authority (MOH, 2015).

Many studies s focused on the factors that contribute to non-compliance with standard precautions such as lack of knowledge, lack of time, forgetfulness, lack of means, negative influence of the equipment on nursing skills, uncomfortable equipment, skin irritation, lack of training, conflict between the,

need to provide care and self-protection and distance to necessary equipment or facility (Efstathiou *et al.,* 2011).

2.16. Infection Control During Caesarean Section

Effective interventions to decrease surgical site infection include prophylactic antibiotic use (preoperative first generation cephalosporin and intravenous azithromycin), chlorhexidine skin preparation instead of iodine, hair removal using clippers instead of razors, vaginal cleansing by povidone-iodine, placental removal by traction of the umbilical cord instead of by manual removal, suture closure of subcutaneous tissue if the wound thickness is >2 cm, and skin closure with sutures instead of with staples. Implementation of surgical bundles in non-obstetric patients has been promising., Creating a similar patient care bundle comprised evidence-based elements in patients who undergo CD may decrease the incidence of this major complication. Each hospital has the opportunity to create its own CD surgical bundle to decrease surgical site infection. (Kawakita & Landy 2017).

2.17. Infection Control Officer/Team

To develop an annual IPC plan with clearly defined objectives, to develop written policies and procedures, including regular evaluation and updates to prepare an action plan for implementation of the IPC program with approval from the Infection Control Committee (ICC), monitor and evaluate daily practices of patient care designed to prevent infection, identify problems in the implementation of IPC activities which need to be solved or addressed by the ICC, organize epidemiological surveillance for Health- care-associated infections (HAIs) (particularly in high risk areas to detect outbreaks early), investigate outbreaks and provide data (and expert advice) that should be evaluated to allow for any change in practice or allocation of resources and to educate all grades of

staff in IPC policy, practice, and procedures relevant to their own areas (Public, 2013)

2.18. Responsibilities

Healthcare workers all healthcare workers are responsible for Implementing Standard Precautions at all times attending induction and ongoing training on Standard Precautions, reporting any deficits in knowledge or resources to line managers, reporting any illness as a result of occupational exposure, not attending for duty with known or suspected infections without first informing occupational Health department, advising visitors of infection prevention and control requirements such as hand hygiene and cough etiquette managers of Healthcare facilities mangers of healthcare facilities are responsible for ensuring that the resources necessary to implement Standard Precautions are provided including: an occupational health service, an infection prevention and control induction programmed for new staff, an ongoing infection prevention and control education programmed for staff, Equipment (e.g. Personal protective equipment, cleaning equipment), physical infrastructure (isolation rooms, hand wash sinks etc.) development of an action plan to address any noncompliance with Standard Precautions identified by regular audits and an infection prevention and control service (Perlis, 2016).

2.19 Healthcare-associated infection and economic cost .

Healthcare-associated infection is a global health phenomenon that results in substantial economic cost. The primary cost is that patients with hospital-acquired infections have their stay prolonged, during which time they occupy a scarce bed-days and require additional diagnostic and therapeutic interventions. The economic burden of health care-associated infection is substantial, although it varies from country to country. Some studies have shown that an estimated

average cost of US $558 to US$ 593 for each urinary tract infection, US$ 2734 for each surgical-site infection, US$ 3061 to US$ 40 000 for each bloodstream infection, and US$ 4947 for each case of pneumonia could be saved if these infections could be prevented. Estimates of the cost of health care-associated infections, in 2002 prices, suggest that the annual economic costs are US$ 6.7 billion per year in the United States 1.06 billion (approximately US$ 1.7 billion) in the United Kingdom. According to some estimates, preventing a case of health care-associated infection saves on average more than US$ 10 000 and reduces the patient's risk of death from almost 7% to 1.6%. The Major economic impact may follow amplification of epidemics. The SARS pandemic is estimated to have cost around US$ 60 billion, being largely associated with amplification due to unsafe health care (WHO, 2010).

2.20. Previous Studies

Study (No.1**)** A study was done by (Robinson and Grace, 2016). in Port Harcourt. the aim was to determine the knowledge and utilization of nurse-midwives of infection prevention and control lifesaving skill in managing pregnant women in the University of Port Harcourt Teaching Hospital. by A study (Infection Prevention and Control Life Saving Skills: Practice among Midwives in University of Port Harcourt Teaching Hospital Rivers State). A sample population of 83 respondents selected through convenience sampling technique had a self-structured questionnaire was administered to them to collect data for the study. Results showed that (the majority of the respondents 41(49.4%) had good knowledge of the skill under study, but only 15 (18.1%) always utilized it for managing pregnant women. As regards factors affecting the utilization of the concept, the majority, and 79 (95.2%) linked it with poor staffing. Opinion on other factors affecting utilization of infection prevention and control live saving skill among midwives was also high: 74 (89.2%) identified

non-availability of relevant equipment and 66 (79.5%) attributed it to emergency situations).

Study (No. 2) A study was carried- out by (Goje et al., 2018) in (Damaturu, north-eastern Nigeria) the aim was to determine the knowledge, self-efficacy and practice of standard precaution measures among nursing and midwifery in Damaturu, This study utilized a cross-sectional study design, in which self-administered questionnaires were used to collect information from the respondents. A total of 125 respondents participated in the study. Spearman's correlation revealed significant positive correlations between knowledge and practice (r=0.455, p-value <0.001) and between self-efficacy and practice (r=0.391, p-value <0.001). The results of this study show that the respondents possess (very high levels of knowledge, attitude, self- efficacy, and practice .

Previous Study (No. 3) This study was conducted by (SH et al., 2017) in Ethiopia. aimed to assess knowledge, attitude and practice of infection prevention measures among health care workers in Wolaitta Sodo teaching and referral hospital, SNNPR, Ethiopia by A study (Knowledge, Attitude and Practice of Infection Prevention Measures among Health Care Workers in Wolaitta Sodo otona Teaching and Referral Hospital). The study was conducted at Wolaitta Sodo teaching and referral hospital, South East Ethiopia and Cross-sectional study design was used. From the total of 282 participants, two hundred seventy-one were responding to the study. Self-administered questionnaire was used to gather data. Both bivariable and multivariable variable. This study revealed that 99.3% of health care workers had good knowledge and 0.7% of them had poor knowledge.

Study (No. 4) A study was conducted by (Heba et al., 2018) in Egypt. to assess the level of nurses' compliance with infection control standard precautions in Mansoura University. This case study was conducted on (60) nurses who were

working at outpatient clinics of Urology and Nephrology center- Mansoura University, Egypt, from October to December 2016. Tools: Four-structured questionnaire was used throughout the study for exploring nurses 'demographic and occupational characteristics, their knowledge, practice and obstacles that affect nurses' compliance with infection control standard precautions. The study concluded that nurses showed (good level of knowledge) in spite of practice showed unsatisfactory level regarding infection control standard precautions. Moreover, workload, inadequate resources, doesn't continue training courses and insufficient staff were obstacles complained them.

Study (No. 5) A study conducted by (Mehta et al., 2011) in India designed to provide information on procedures and practices related to infection control in labor and delivery units in Gujarat state in twenty health care facilities, including private and public primary health centers and referral hospitals, were sampled from two districts in Gujarat state, India. Three pre-tested tools for interviewing and for observation were used. The data collection was based on existing infection control guidelines for clean practices, clean equipment, clean environment and availability of diagnostics and treatment. The study was carried out from April to May 2009. Seventy percent of subjects said that standard infection control procedures were followed, but a written procedure was only available in 5% of facilities. Alcohol rubs were not used for hand cleaning and surgical gloves were reused in over 70% of facilities, especially for vaginal examinations in the labor room. Most types of equipment and supplies were available, but a third of facilities did not have wash basins with “hands-free” taps. Only 15% of facilities reported that the wiping of surfaces was done immediately after each delivery in labor rooms. Blood culture services were available in 25% of facilities and antibiotics are widely given to women after normal delivery.

Chapter Three

Methodology

3. Methodology

In this part of study, the methodology used for conducting this research will be discussed. This chapter will discuss different stages of the study from beginning which is approval of the topic to the end that discuss the collected data's analysis.

3.1. Design of the Study

The design of this study is a descriptive observation design aimed to Nurses-Midwives Practices Towards Infection Control Precautions at Wards in Al Najaf Hospitals

. The study was conducted from the period of November /4th / 2021 to March /13th /2023.

3.2. Administrative Approvals

A series of arrangements and approvals have been done for the current study to obtain official consents and facilities include the following:

1. An oral consent was acquired from all of the participants in the research work while illustrating the confidential and volunteer nature of the participation
2. The approval of the study was obtained.
3. The scientific protocol for the study and the papers forms concerned with the ethics of scientific research and the pledges that officially adopted by the scientific research ethical committee at the College of Nursing / University of Babylon were completed (Appendix A).
4. The college of Nursing University of Babylon's authorization to Al-Najaf Al-Ashraf General Health Directorate (Appendix B).
5. Hospitals got the approval from the General Directorate of Health Al-Najaf Al-Ashraf province (Appendix C).

3.3. Ethical Considerations

Before starting to collect data from the sample participating in the study, the researcher provided a brief explanation of the scientific background of the research, the purpose of conducting it, and the role of the nurses participating in this study presented, to give them a complete and clear idea of the study that will be conducted. On the other hand, the researcher confirmed that all nurses participating in the study have the right to stop participating in the study and they can withdraw from this study if they feel uncomfortable or disturbed by some of the questionnaire items that were prepared as a research tool or the method of data collection or anything else.

3.4. Setting of Study

This study is conducted in Al-Najaf Al-Ashraf Governorate after obtaining the official approval for that from the Al-Najaf Al-Ashraf Health Department. The hospitals that have been accredited as a place to conduct the study are (Al-Forat Teaching Hospital, Al-Zahra Teaching Hospital, Al-Sajad General Hospital, and Al-Hakim General Hospital). All hospitals in which the study were conducted have special departments for Maternal Surgical Wards .

Table (3.1) Distribution of Maternal departments to their working place.

Maternal Teaching Hospitals	**Department that Selected in the Hospital**	**Working Shift**
-Al-Forat Teaching Hospital -Al-Zahra Teaching Hospital -Al-Sajad General Hospital -Al-Hakim General Hospital	Maternity surgical wards	Morning and evening shift

3. 5. The Sample of Study

The target population in this study were female nurses and midwives, so after obtaining the official approvals to conduct this study by the Al-Najaf General Health Directorate. only four hospitals were selected from them. A non-probability convenient sample consists of (100) female nurses and midwives, have been chosen from four maternal surgical wards in the four hospitals at Al-Najaf governorate (Al-Forat Teaching Hospital, Al-Zahra Teaching Hospital, Al-Sajad General Hospital, and Al-Hakim General Hospital.). The investigator collected the data from study sample (the nurses who work in the maternal surgery wards) in the hospitals that were chosen as the place to do this study. The number of nurses who were selected to participate in the study is (100) while the total number of nurses and midwives who work in the maternal surgery wards was (170).

The data collection was started from the sample participating in the study (the nurses who work in the maternal surgery wards) from the time period (May 29th to December 29th 2022).

Table (3.2) Distribution of the Study Sample according to their hospitals (surgical wards) in Al-Najaf Hospitals

No	Name of Hospital	Number of Nurses in the maternal wards		Total
1-	-Al-Forat Teaching Hospital	Morning	Night	25
		15	10	
2-	Al-Zahra Teaching Hospital	Morning	Night	30
		20	10	
3-	Al-Sajad General Hospital	Morning	Night	15
		10	5	
4-	Al-Hakim General Hospital	Morning	Night	30
		20	10	

The inclusion criteria that were followed in selecting the study sample:

1. Midwives nurses who had experience in working in maternal surgical wards for more than 1 year
2. Nurses who are present in the maternal surgical wards during the time of data gathering

The exclusion criteria include the following:

1. Nurses who are occupying administrative positions in the maternal surgical wards
2. Nurses who are participated in the pilot study.
3. Other health care providers specialties who are work in the field of nursing

3.6. Instrument of Study:

In order to carry-out this study and achieve the objectives. A reconstructed questionnaire was prepared and modified after a thorough review of the relevant literatures. The final study questionnaire covers eight parts as follows: (Appendix D)

Part I. Demographic characteristic of the study sample:

This part included the following (age, educational level, residency, marital status).

Part II. Work related data:

This part consists of (years of experience in nursing, working experience in the maternal surgical wards, and training courses related in infection control precautions.

Part III Check list including measures of infection control precaution following:

3.A. Observational check list regarding infection control precautions:

This part includes (11) items. health provider routinely washes hand before procedure, health provider routinely washes hand after procedure, soap and water available at all times for hand washing, health provider vigorously

rub hand with antiseptic and/or water before aseptic procedure such as wound dressing, health provider nails are short, clean and free from nail extensions and varnish, health provider are not worn wrist watches, stoned rings or other wrist jewelry during clinical procedures, hand washing facilities are clean and intact (check sinks, taps, splash backs, soap & towel dispensers). posters promoting hand hygiene are on display (including 'how to' posters by sinks) clinical staff are encouraged to use moisturizers that are pump operated or personal use only. and soft absorbent paper towels are available at all hand wash sinks

3.B. Personal protective equipment:

This part includes (27) items-health provider has trained in the use of personal protective equipment as part of local departmental induction, gloves: select glove appropriate to task sterile (surgical gloves) are used for performing sterile procedures (wound dressing, suturing) sterile and nonsterile gloves(examination gloves) are available non-sterile disposable gloves are used for contact with non-intact skin, any body fluids, or mucous membranes, There is an appropriate range of sizes available, wear the correct size of gloves, clean hands before putting on gloves for a clean / aseptic procedures, hands are decontaminated following removal of gloves, changed gloves between patients, gloves are worn as single use items and discarded immediately for each clinical procedures or episode of patient care, change or remove gloves if moving from a contaminated body site to a clean body site within the same client/patient/resident, frequently gloves worn before and after for procedures, and gloves are stored appropriately

3.C. Gowns or Aprons:

health worker wear a cover gown / apron during the procedures**,** Gown / apron available for use changed gowns / aprons between patients, gowns fluid proof, do the gowns have long sleeves, Protective eye (e.g., goggles) are available, wear Protective eye during procedures**,** Protective Closed toe shoes or shoe covers (e.g., booties) available, wear Protective Closed toe shoes or shoe

covers during vaginal deliveries, Protective Clean face masks are available, wear Protective clean face masks during vaginal deliveries procedures**,** protective clean overhead (hair cover) are available, and wear protective clean overhead (hair cover) during procedures

3.D. Prevention of sharp injuries:

This part includes (8) items: splash/ bite injury management and are aware of the actions to take following an injury, sharps containers are available at the point of use sharps containers are correctly assembled, labelled with date, locality and signed The are no inappropriate items (eg; swabs/ packaging/ gloves) in the sharps container, needles & syringes are disposed of as a single unit, syringes with a residue of prescription medication are disposed of according to current legislation, The temporary closure mechanism is used when the bin is not in use, and. sharps containers are visibly clean with no, dust, dirt or debris

3.E. Contamination with blood/ body fluids:

This part includes (5) items: cleaning body fluid, personal protective equipment is available (aprons, gloves, masks) equipment used to clear up body fluid disposable or able to be decontaminated, medical equipment which has been contaminated with body fluids is cleaned appropriately and a permit to work document completed (e.g., decontamination certificate/ Labe, furniture which has been contaminated with body substances and cannot be cleaned is condemned.

3.F. Waste management:

This part includes (11) items: The waste storage area is clean and dry, all plastic waste sacks are fully enclosed within bins to minimize the risk of injury, all waste bins used are lidded, foot operated and in good working order, waste bags are removed from clinical areas daily, disposal of sharps in a sharps solid container disposal of gloves in a red bag, disposal of swabs and other contaminated materials in a container with red bag, disposal of non-

contaminated materials in a black bag, there is no emptying of clinical waste from one bag to another, there are no overfilled bags- bags are no more than 2/3 full

3.G. Environment:

This part includes (11) items: overall appearance of the environment is tidy and uncluttered with only appropriate, clean and well maintained furniture used, fabric of the environment and equipment smells clean, fresh and pleasant, The complete floor, including edges and corners are visibly clean with no dust, body substances, dirt or debris, furniture, fixtures and fittings are visibly clean with no body substances, dirt, dust, debris or adhesive tape, all dispensers, holders (couch roll, toilet paper, soap and alcohol gel) are visibly clean with no dirt, dust, debris, body substances or adhesive tape, toilets are visibly clean with no body substances, dust, lime scale stains, deposits or smears; including beneath toilet seat and raised toilet seats, waste receptacles are clean, including lid and pedal, medical equipment is cleaned, maintained and stored appropriately, pillows are enclosed in a washable and impervious cover, couches and chairs are free from rips and tears, tables are tidy and free from clutter to enable cleaning.

3.7. Validity of the instrument:

The validity of the (check list) used as a study instrument its crucial effect on the research outcomes that are obtained after analyzing the data which is gathering from the sample who are participating in the study. Ordinarily, the validity of the questionnaire is correlating to the tools that is utilize in the research and its ability to measure the topic which is intended to studied and the accuracy of the readings taken from those tools.

The (check list) was shown on twelve experts acquired the legitimacy of our generated questionnaire who had an experience of minimum three years in their distinct field. moreover, a relevancy and precision of questionnaire

Appendix (C) was measured through their consultation. The professionals who contributed in this study included, one from Babylon University, one from Al-Kufa College of Medicine, three form the from Al-Kufa College of Nursing, one from AL-Tosi College, one from AL-Mostkbal College of Nursing College, one from AL-Hilla College of Nursing, one from University of Babylon Nursing College, one from Al-Furat Al-Awsat Technical University, one from Warith University College of Nursing, two from Al-Najaf Al-Ashraf General Health Directorate. All of them were provided with a questionnaire draft copy. The mechanism was approved to be vibrant, sufficient and relevant by most of them. Amendments were made centered upon the recommendation and propositions of the connoisseurs.

3.8. Rating and Scoring

The evaluation was achieved by observational check list regarding infection control precautions measures. Three observations have been done for each nurse midwife al three different times a day. (The scoring was according to the number of correct practices of infection control precautions measures as follows: 1 (for one time only); 2 (for two times) and 3 (for three times).

This assessment is based on the statistical scoring system, in which the item is classified as (poor) if the mean of scores between (1-1.66); it is considered (moderate) if the mean of scores between (1.67-2.33); while it is considered (good) if the mean of scores is more than (2.34).

3.9. Pilot Study:

A pilot study on (10) nurse midwives at the maternal surgical wards of AL-Zahra General hospital from Al- Najaf AL-Ashraf province which represent (10%) of the total number of the studied population from July 28th / to August 28th/ 2022.

The aim of the pilot study is to find out the potential obstacles that may arise throughout the data gathering process.

2. Identify the reliability of the relevant of questionnaire

3. Mandatory time determination for the questionnaire completion by each member.

3.10. Reliability of Questionnaire

A precise statistical method usage helped in determining the questionnaire reliability, which was subsequent to the study questionnaire's outcomes preparation for pilot study. The results exhibited that our questionnaire about (infection control precaution) was reliable and consistent in measuring the phenomena of interest. The Cronbach-alpha was (0.82) which is statistically acceptable.

Table 1: Study Questionnaire's Reliability Coefficient

Reliability method (Stability)	Obtained value	Accepted value	Assessment
Cronbach-alpha	0.82	0.700	accepted

3.11. Data Collection:

A structured questionnaire used to collect data by direct interview. The approximate interview time of 25-30 minutes was provided for the questionnaire completion. Data collection is performed from 2 May 2022 to 2 September 2022.

3.12. Statistical Analysis:

Statistical Package for social sciences (SPSS) with version 25was used for the data analysis.

The software of statistical analysis was preferred for data analysis and data entry. SPSS 25 version named as statistical package for social sciences was used in all statistical procedures and data management, additionally, Microsoft excel software was used in graphical presentation of some variables. All data

were checked for and prepared for analysis using the cleaning statistical and transformation methods. Categorical variables were coded accordingly and normal curve plot of distribution was utilized for the continuous variables test with usual distribution histogram.

3.12.1. Descriptive Statistics Analysis:

The continues (quantitative), variables presented as mean, standard deviation and range, while the categorical (qualitative) variables presented as frequency and percentages, according to the following equations:

a. percentage: $$\% = \frac{\sum f}{n} \times 100\%$$

b. Mean (average): $$\text{Mean } (\bar{X}) = \frac{\sum X}{n}$$

c. Standard deviation (s) $$S = \sqrt{\frac{\sum (X - \bar{X})^2}{n-1}}$$

where S = the standard deviation of a sample,
Σ means "sum of,"
X = each value in the data set,
$\bar{X}$ = mean of all values in the data set,
n = number of values in the data set.

3.12.2. Inferential Statistics:

F test was used to compare means between three or more independent groups. Level of significance of ≤ 0.05 was considered as significant difference or correlation. Midwives' practice assessment is based on the statistical scoring system, in which the item is classified as (poor) if the mean of scores between (1-1.66); it is considered (moderate) if the mean of scores between (1.67-2.33); while it is considered (good) if the mean of scores is more than (2.34).

Chapter Four

Results

4. Results

Table (4.1): Distribution of sample according to their demographic data:

Demographic data		F	%
Age / Years	20-30	62	62.0
	31-40	18	18.0
	41-50	20	20.0
Total		**100**	**100**
Educational Achievement	Nursing School graduate	8	8.0
	Secondary Nursing School	16	16.0
	Secondary Midwifery School	60	60.0
	Midwifery Institute	0	0.0
	Nursing Institute	8	8.0
	B.Sc. in Nursing and above	8	8.0
Total		100	100
Residency	Urban	91	91.0
	Rural	9	9.0
Total		100	100
Marital Status	Single	16	16.0
	Married	68	68.0
	Divorced	16	16.0
Total		100	100

F = Frequency % = Percentage

Table (4.1). demonstrates that nurse's midwives' ages ranging between F= frequency (20-30) years per = (62%); those who are secondary midwifery school P = percentage (60%); are P=percentage (91%) of the sample live in urban area and per = (68%). are married See: figures (4.1), (4.2), (4.3) and (4.4).

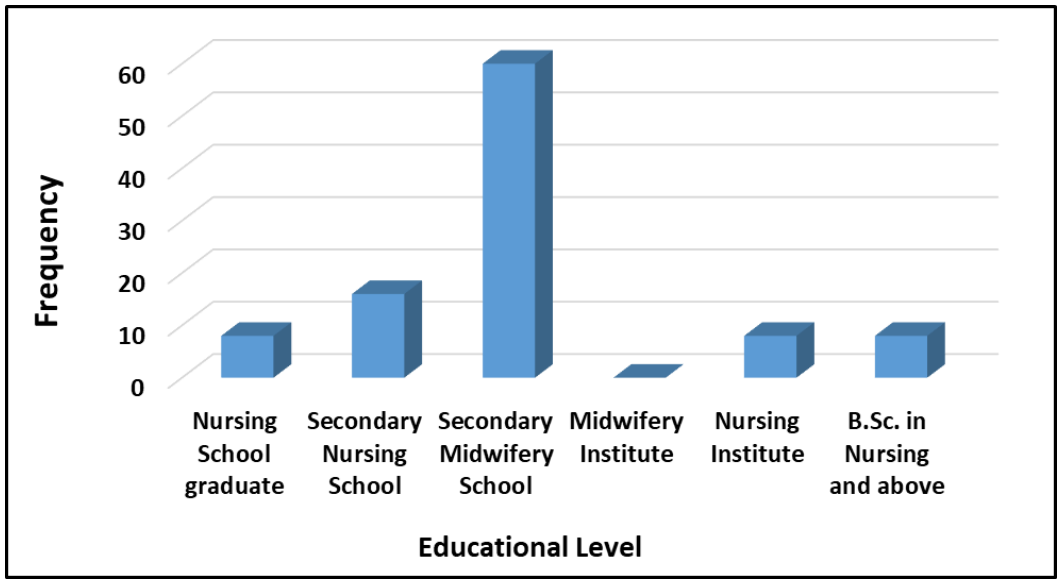

Figure (4.1): Bar chart distribution of sample according to their age

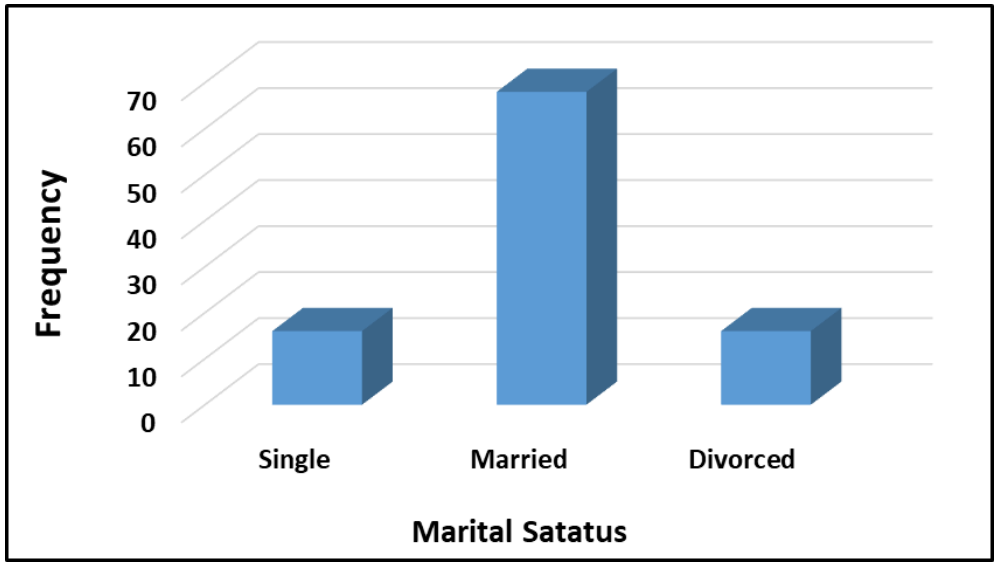

Figure (4.2 Distribution of sample according to their residence

Table (4.2): Distribution of sample according to their working data

Demographic Data		F (N=100)	%
Years of experience in nursing	1-5 years	68	68.0
	6-10 years	8	8.0
	≥ 11 years	24	24.0
Total		100	100
Working experience in the maternal surgical wards	1-5 years	76	76.0
	6-10 years	24	24.0
Total		100	100
Training courses related in infection control precautions	1-3	75	75.5
	≥ 4	25	25.0
Total		100	100
Number of Training Courses	Yes	100	100.0
	No	0	0.0
Total		100	100
Duration of Courses	≤ One Weeks	79	79.0
	> One Weeks	21	21.0
Total		100	100

F = Frequency %= percentage

Table (4.2) reveals the descriptive statistics (frequency and percentage) for the working data of nurse's midwives. This table shows that the majority of the nurse's midwives are: those have (1-5) years of experience in nursing (68%); (1-5) years of working experience in the maternal surgical wards (76%); (1-3) years of training courses related in infection control precautions (75%); (100%) of them have training courses; and finally, those with less than one week's duration of courses (76%).

Figure (4.5): Bar chart for the distribution of sample (frequency and percentage) of nurse's midwives according to their years of experience in nursing

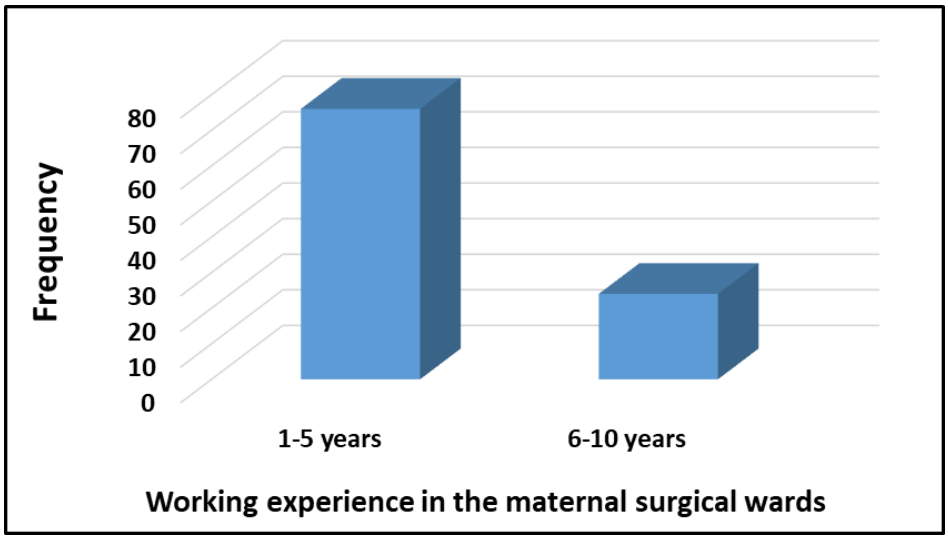

Figure (4.3): Bar chart for the distribution of sample (frequency and percentage) of nurse's midwives according to their training courses related to infection control precautions

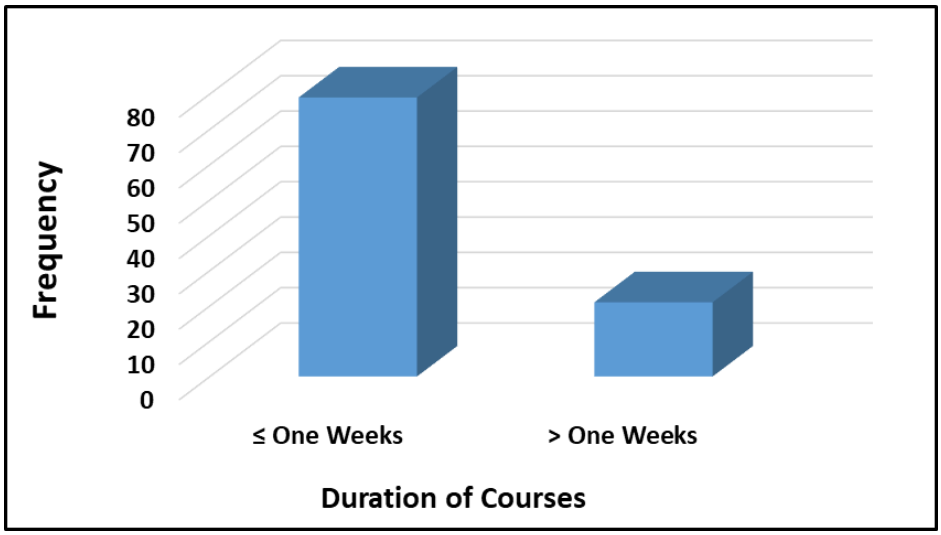

Figure (4.4): Bar chart for the distribution of nurse's midwives according to their duration of courses

Table (4.3) Assessment of midwives' practice regarding hand hygiene

No.	Items	Observation	Freq.	Per. %	MS	Assessment
1	**Health provider routinely washes hand before procedure**	Not done	8	8	**2.08**	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
2	**Health provider routinely washes hand after procedure**	Not done	8	8	**2.08**	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
3	**Soap and water available at all times for hand washing**	Not done	8	8	**2.08**	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
4	**Health provider vigorously rub hand with antiseptic and/or water before aseptic procedure such as wound dressing**	Not done	8	8	**2.08**	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
5	**Health provider nails are short, clean & free from nail extensions & varnish**	Not done	73	73	**1.35**	**Poor**
		Partially done	19	19		
		Completely done	8	8		
6	**Health provider are not worn wrist watches, stoned rings or other wrist jewelry during clinical procedures**	Not done	8	8	**2.08**	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
7	**Hand washing facilities are clean and intact (check sinks, taps, splash backs, soap & towel dispensers)**	Not done	48	48	**1.62**	**Poor**
		Partially done	42	42		
		Completely done	10	10		
8	**Posters promoting hand hygiene are on display**	Not done	40	40	**1.6**	**Poor**
		Partially done	60	60		
		Completely done	0	0		
9	**(Clinical staff are encouraged to use moisturizers that are pump operated or personal use only)**	Not done	40	40	**1.6**	**Poor**
		Partially done	60	60		
		Completely done	0	0		
10	**Soft absorbent paper towels are available at all hand wash sinks**	Not done	8	8	**2.08**	**Moderate**
		Partially done	76	76		
		Completely done	16	16		

MS: Mean of Scores; SD` : Standard Deviation; Poor: MS = 1-1.66; Moderate: MS =1.67-2.33; Good: MS ≥2.34: Freq. = Frequency; Per. = Percentage

Table (4.3) shows the observational evaluation of midwives' practices regarding hand hygiene. The table shows that majority of nurses midwives exhibited moderate level regarding hand hygiene, some items exhibited poor assessment. This assessment is based on the statistical scoring system, in which the item is classified as (poor) if the mean of scores between (1-1.66) it is considered (moderate) if the mean of scores between (1.67-2.33); while it is considered (good) if the mean of scores is more than (2.34).

Table (4.4) Assessment of midwives' practice regarding personal protective equipment

No.	Items	Observation	Freq	Per. %	MS	Assessment
1	**Select glove appropriate to task**	Not done	77	77	1.23	**Poor**
		Partially done	23	23		
		Completely done	0	0		
2	**Sterile (surgical gloves) are used for performing sterile procedures (wound dressing, suturing)**	Not done	83	83	1.17	**Poor**
		Partially done	17	17		
		Completely done	0	0		
3	**Sterile and nonsterile gloves (examination gloves) are available**	Not done	86	86	1.14	**Poor**
		Partially done	14	14		
		Completely done	0	0		
4	**Non-sterile disposable gloves are used for contact with non-intact skin, any body fluids, or mucous membranes**	Not done	72	72	1.28	**Poor**
		Partially done	28	28		
		Completely done	0	0		
5	**There is an appropriate range of sizes available**	Not done	74	74	1.26	**Poor**
		Partially done	26	26		
		Completely done	0	0		
6	**Wear the correct size of gloves**	Not done	93	93	1.07	**Poor**
		Partially done	7	7		
		Completely done	0	0		
7	**Clean hands before putting on gloves for a**	Not done	10	10	2.06	**Moderate**
		Partially done	74	74		

	clean/aseptic procedure	Completely done	16	16		
8	**Hands are decontaminated following removal of gloves**	Not done	35	35	1.72	**Moderate**
		Partially done	58	58		
		Completely done	7	7		
9	**Changed gloves between patients**	Not done	76	76	1.28	**Poor**
		Partially done	20	20		
		Completely done	4	4		
10	**Gloves are worn as single use items and discarded immediately for each clinical procedures or episode of patient care**	Not done	75	75	1.25	**Poor**
		Partially done	25	25		
		Completely done	0	0		
11	**Change or remove gloves if moving from a contaminated body site to a clean body site within the same client/patient/resident**	Not done	86	86	1.14	**Poor**
		Partially done	14	14		
		Completely done	0	0		
12	**Frequently gloves worn before and after for procedures**	Not done	88	88	1.14	**Poor**
		Partially done	10	10		
		Completely done	2	2		
13	**Gloves are stored appropriately**	Not done	89	89	1.13	**Poor**
		Partially done	9	9		
		Completely done	2	2		
14	**Select glove appropriate to task**	Not done	0	0	2	**Moderate**
		Partially done	100	100		
		Completely done	0	0		

MS: Mean of Scores; SD: Standard Deviation; Poor: MS = 1-1.66; Moderate: MS =1.67-2.33; Good: MS≥2.34; Freq. = Frequency; Per. = Percentage

Table (4.4) reveals that the majority of nurses midwives exhibited poor level regarding personal protective equipment, some items exhibited poor assessment, while the other items the nurses' midwives showed moderate practices. This assessment is based on the statistical scoring system, in which the item is classified as (poor) if the mean of scores between (1-1.66); it is considered

(moderate) if the mean of scores between (1.67-2.33); while it is considered (good) if the mean of scores is more than (2.34).

Table (4.5) Assessment of midwives' practice regarding gowns or aprons

No.	Items	Observation	Freq	Per %	MS	Assessment
1	**Health workers wear a cover gown apron during the procedures**	Not done	82	82	1.22	**Poor**
		Partially done	14	14		
		Completely done	4	4		
2	**Gown / apron available for use**	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
3	**Changed gowns aprons between patients**	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
4	**Gowns fluid proof**	Not done	25	25	1.89	**Moderate**
		Partially done	61	61		
		Completely done	14	14		
5	**Do the gowns have long sleeves**	Not done	20	20	1.94	**Moderate**
		Partially done	66	66		
		Completely done	14	14		
6	**Protective eye (e.g., goggles) are available**	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
7	**Wear Protective eye during any procedures**	Not done	18	18	1.96	**Moderate**
		Partially done	68	68		
		Completely done	14	14		
8	**Protective Closed toe shoes or shoe covers (e.g., booties) available**	Not done	12	12	2.04	**Moderate**
		Partially done	72	72		
		Completely done	16	16		
9	**Wear Protective Closed toe shoes or shoe covers after vaginal deliveries**	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
10	**Protective Clean face masks are available**	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
11	**Wear Protective Clean face masks during vaginal deliveries procedures**	Not done	18	18	1.96	**Moderate**
		Partially done	68	68		
		Completely done	14	14		
12	**Protective Clean overhead (hair cover) are available**	Not done	12	12	2.04	**Moderate**
		Partially done	72	72		
		Completely done	16	16		

13	**Wear protective clean overhead (hair cover) during procedures**	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		

MS: Mean of Scores; SD: Standard Deviation; Poor: MS = 1-1.66; Moderate: MS =1.67-2.33; Good: MS≥2.34: Freq. = Frequency; Per. = Percentage

Table (4.5) the observational evaluation of midwives' practices regarding gowns or aprons. Majority of nurses midwives exhibited moderate level practices regarding gowns or aprons, while only items (1) the nurses midwives showed poor practices (1.22) mean of score. This evaluation is based on the statistical scoring system, in which the item is classified as (poor) if the mean of scores between (1-1.66); it is considered (moderate) if the mean of scores between (1.67-2.33); while it is considered (good) if the mean of scores is more than (2.34).

Table (4.6) Assessment of midwives' practices regarding prevention of sharp injuries

No	Items	Observation	Freq.	Per. %	MS	Assessment
1	Health provider received training in sharps/ splash/ bite injury management and are aware of the actions to take following an injury	Not done	8	8	2.08	Moderate
		Partially done	76	76		
		Completely done	16	16		
2	Sharps containers are available at the point of use of	Not done	26	26	1.86	Moderate
		Partially done	62	62		
		Completely done	12	12		
3	Sharps containers are correctly assembled, labeled with date, locality	Not done	8	8	2.08	Moderate
		Partially done	76	76		
		Completely done	16	16		

	& signed					
4	The are no inappropriate items (eg; swabs/ packaging/ gloves) in the sharp's container are available at the point of use	Not done	84	84	1.18	Poor
		Partially done	14	14		
		Completely done	2	2		
5	Needles & syringes are disposed of as a single unit	Not done	99	99	1.02	Poor
		Partially done	0	0		
		Completely done	1	1		
6	Syringes with a residue of prescription medication are disposed of according to current legislation	Not done	93	93	1.09	Poor
		Partially done	5	5		
		Completely done	2	2		
7	The temporary closure mechanism is used when the bin is not in use	Not done	18	18	1.96	Moderate
		Partially done	68	68		
		Completely done	14	14		
8	Sharps containers are visibly clean with no, dust, dirt or debris	Not done	80	80	1.2	Poor
		Partially done	20	20		
		Completely done	0	0		

MS: Mean of Scores; SD : Standard Deviation; Poor: MS = 1-1.66; Moderate: MS =1.67-2.33; Good: MS≥2.34: Freq. = Frequency; Per. = Percentage

Table (4.6) reveals that regarding items (1,2,3,7) the nurses midwives exhibited moderate level regarding prevention of sharp injuries, while the in other items, the nurse's midwives showed poor practice.

Table (4.7) Assessment of midwives' practices regarding contamination with blood, body fluids

No	Items	Observation	Freq	Per. %	MS	Assessment
1	Cleaning body fluid	Not done	100	100	1	Poor
		Partially done	0	0		
		Completely done	0	0		
2	Personal Protective equipment is available (aprons, gloves, masks)	Not done	97	97	1.04	Poor
		Partially done	2	2		
		Completely done	1	1		
3	Equipment used to clear up body fluid is disposable or able to be decontaminated	Not done	79	79	1.24	Poor
		Partially done	18	18		
		Completely done	3	3		
4	Medical equipment which has been contaminated with body fluids is cleaned appropriately and a permit to work document completed	Not done	20	20	1.9	Moderate
		Partially done	70	70		
		Completely done	10	10		
5	Furniture which has been contaminated with body substances and cannot be cleaned is condemned .	Not done	20	20	1.96	Moderate
		Partially done	64	64		
		Completely done	16	16		

MS: Mean of Scores; SD : Standard Deviation; Poor: MS = 1-1.66; Moderate: MS =1.67-2.33; Good: MS≥2.34: Freq. = Frequency; Per. = Percentage

Table (4.7) illustrates the observational evaluation of midwives' practice regarding the contamination with blood/ body fluids. The items (1,2,3) the nurses midwives exhibited poor level (contamination with blood body fluids), while the other items, the nurse's midwives showed moderate practice. This is based on the statistical scoring system, in which the item is classified as (poor) if the mean of scores between (1-1.66); it is considered (moderate) if the mean of scores between (1.67-2.33); while it is considered (good) if the mean of scores is more than (2.34).

Table (4.8) Practices of nurse's midwives' regarding waste management

No	Items	Observation	Freq	Per. %	MS	Assessment
1	Health provider have attended a training session which includes information about the correct & safe disposal of waste	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
2	The waste storage area is clean & dry	Not done	100	100	1	**Poor**
		Partially done	0	0		
		Completely done	0	0		
3	All plastic waste sacks are fully enclosed within bins to minimize the risk of injury	Not done	61	61	1.5	**Poor**
		Partially done	28	28		
		Completely done	11	11		
4	All waste bins used are lidded, foot operated and in good working order	Not done	64	64	1.42	**Poor**
		Partially done	30	30		
		Completely done	6	6		
5	Waste bags are removed from clinical areas daily	Not done	64	64	1.42	**Poor**
		Partially done	30	30		
		Completely done	6	6		
6	Disposal of Sharps in a Sharps Solid Container	Not done	65	65	1.41	**Poor**
		Partially done	29	29		
		Completely done	6	6		
7	Disposal of Gloves in a Red Bag	Not done	65	65	1.41	**Poor**
		Partially done	29	29		
		Completely done	6	6		
8	Disposal of Swabs and Other Contaminated Materials in a Container with Red Bag	Not done	64	64	1.42	**Poor**
		Partially done	30	30		
		Completely done	6	6		
9	Disposal of Non contaminated Materials in a Black Bag	Not done	67	67	1.39	**Poor**
		Partially done	27	27		
		Completely done	6	6		
10	There is no emptying of clinical waste from one bag to another	Not done	67	67	1.39	**Poor**
		Partially done	27	27		
		Completely done	6	6		
11	There are no overfilled bags- bags are no more than 2/3 full	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		

MS: Mean of Scores; SD : Standard Deviation; Poor: MS = 1-1.66; Moderate: MS =1.67-2.33; Good: MS≥2.34: Freq. = Frequency; Per. = Percentage

Table (4.8)) that midwives' practices regarding gowns or aprons. exhibited poor level, while the items (1 and 11) the nurses midwives showed moderate level of practices.

Table (4.9) Assessment of midwives' practice regarding environment

No	Items	Evaluation	Freq	Per.%	MS	Assessment
1	Overall appearance of the environment is tidy &uncluttered with only appropriate, clean and well-maintained furniture used	Not done	100	100	1	**Poor**
		Partially done	0	0		
		Completely done	0	0		
2	Fabric of the environment and equipment smells clean, fresh & pleasant	Not done	90	90	1.1	**Poor**
		Partially done	10	10		
		Completely done	0	0		
3	The complete floor, including edges and corners are visibly clean with no dust, body substances, dirt or debris	Not done	79	79	1.23	**Poor**
		Partially done	19	19		
		Completely done	2	2		
4	Furniture, fixtures &fittings are visibly clean with no body substances, dirt, dust, debris or adhesive tape	Not done	100	100	1	**Poor**
		Partially done	0	0		
		Completely done	0	0		
5	All dispensers, holders (couch roll, toilet paper, soap & alcohol gel) are visibly clean with no dirt, dust, debris, body substances or adhesive tape	Not done	44	44	1.66	**Poor**
		Partially done	46	46		
		Completely done	10	10		
6	Toilets are visibly clean with no body substances, dust, lime scale stains, deposits or smears- including beneath toilet seat and raised toilet seats	Not done	8	8	2.08	**Moderate**
		Partially done	76	76		
		Completely done	16	16		
7	Waste receptacles are clean, including lid & pedal	Not done	43	43	1.68	**Moderate**
		Partially done	46	46		
		Completely done	11	11		
8	Medical equipment is cleaned, maintained, and stored appropriately	Not done	72	72	1.34	**Poor**
		Partially done	22	22		
		Completely done	6	6		
9	Pillows are enclosed in a washable and impervious cover	Not done	21	21	1.95	**Moderate**
		Partially done	63	63		
		Completely	16	16		

		done				
10	Couches and Chairs are free from rips and tears	Not done	30	30	1.89	**Moderate**
		Partially done	51	51		
		Completely done	19	19		
11	Tables are tidy and free from clutter to enable cleaning	Not done	10	10	2.06	**Moderate**
		Partially done	74	74		
		Completely done	16	16		

MS: Mean of Scores; SD : Standard Deviation; Poor: MS = 1-1.66; Moderate: MS =1.67-2.33; Good: MS≥2.34: Freq. = Frequency; Per. = Percentage

Table (4.9) reveals that observational evaluation of midwives' practice regarding environment. The table shows that for some of the items the nurses midwives exhibited moderate level regarding environment, some items exhibited poor assessment, while the items (1 and 11) the nurses midwives showed good practice. This assessment is based on the statistical scoring system, in which the item is classified as (poor) if the mean of scores between (1-1.66); it is considered (moderate) if the mean of scores between (1.67-2.33); while it is considered (good) if the mean of scores is more than (2.34).

Table (4.10) Overall of mean of scores of domains infection control precautions

No.	Items	MS	SD	Assessment
1	Hand Hygiene	1.87	0.29	Moderate
2	Personal Protective Equipment	1.35	0.31	Poor
3	Gowns or Aprons	1.96	0.26	Moderate
4	Prevention of sharp injuries	1.56	0.47	Poor
5	Contamination with blood/ body fluids	1.43	0.47	Poor
6	Waste Management	1.44	0.26	Poor
7	Environment	1.54	0.41	Poor
Overall infection control precautions practice		1.59	0.35	Poor

MS: Mean of Scores; SD : Standard Deviation ; Poor : MS = 1-1.66 ; Moderate : MS =1.67--2.33 ; Good : MS≥2.34

Table (4.10) presents the overall mean of score related to the infection nurses' responses. The result of this table indicate the most scored (poor) level .

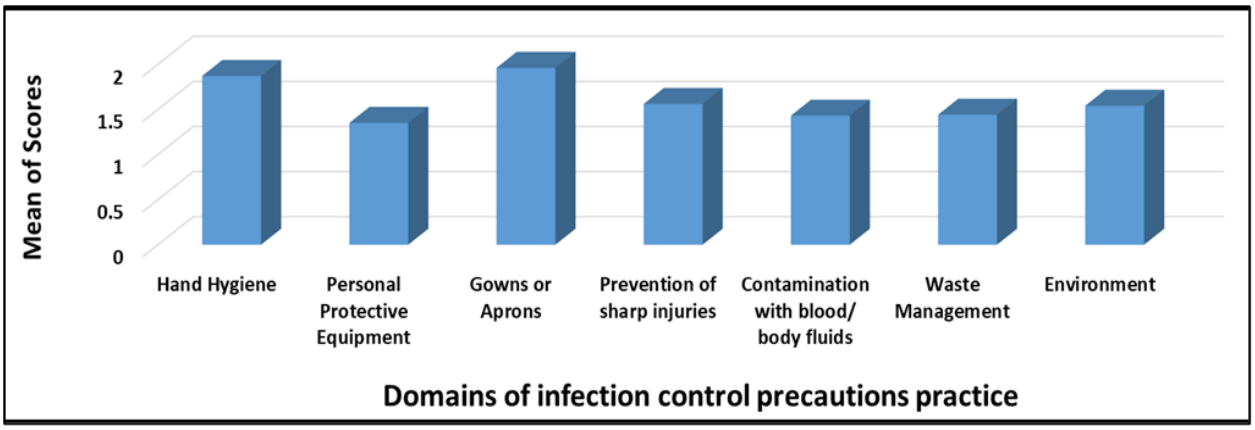

Figure (4.4) mean of scores of domains infection control precautions practice

Table (4.11): Distribution of sample according to their duration of courses for nurse's midwives' assessment regarding their practice infection control precautions

Statistics	Infection Control Precautions Practice		
	Poor	Moderate	Good
Frequency	80	19	1
Percentage	80	19	1

HS: high significance at P<0.01; **NS: Non-Significant at P>0.05**

Table (4.11) show the distribution regarding the practices infection control precautions for nurse's midwives' assessment regarding infection control precautions practice. the percentage of nurse's midwives with (poor) assessment of their practice infection control precautions was (80%); those with (moderate) assessment was (19%); while those with (good) practice was only (1%).

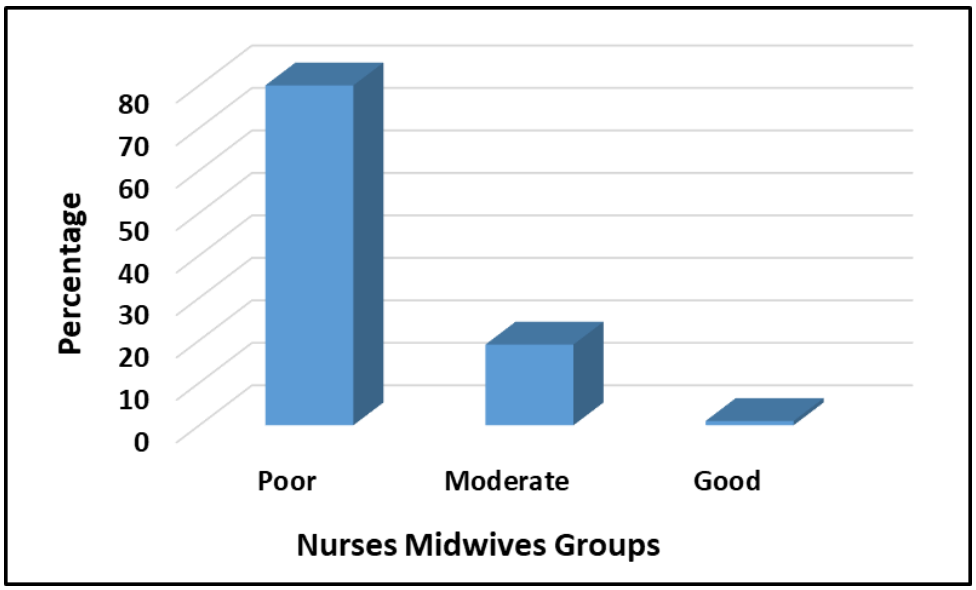

Figure (4.5): Distribution of sample. for nurses midwives' assessment regarding infection control precautions practices.

Table (4.12) ANOVA table for the association between demographic data and the overall assessment of nurse's midwives practice regarding infection control

Demographic data		Mean	SD	F Test	P value
Age / Years	2-30	0.19	0.02	0.14	0.87 NS
	31-40	0.22	0.05		
	41-50	0.24	0.05		
Educational Status	Nursing School graduate	1.25	0.08	103.78	0.000 HS
	Secondary Nursing School	1.53	0.07		
	Secondary Midwifery School	1.58	0.06		
	Nursing Institute	1.98	0.22		
	B.Sc. in Nursing and above	1.96	0.13		
Residence	Urban	1.61	0.21	0.19	0.66 NS
	Rural	1.58	0.07		
Marital Status	Single	1.47	0.18	7.86	0.001 HS
	Married	1.61	0.19		
	Divorced	1.73	0.20		

NS: Non-significant at p value >0.05 ; HS: High Significant at p value <0.001

Table (4.12) showed ANOVA table for the association between demographic data and the overall assessment of nurse's midwives practice regarding infection control, it reveals that there is a significant association between nurse's midwives practice and their educational status, in which nurse's midwives that had Institute and above degree showed the highest mean of score comparing to the other categories.

Table (4.13): ANOVA table for the association between working data and the overall assessment of nurse's midwives practice regarding infection control

Demographic data		Mean	SD	F Test	P value
Years of experience in nursing	1-5 years	1.57	0.06	6.7	0.002 Hs
	6-10 years	1.58	0.05		
	≥ 11 years	1.73	0.38		
Working experience in the maternal surgical wards	1-5 years	1.63	0.22	3.04	0.08 NS
	6-10 years	1.55	0.07		
Training courses related in infection control precautions	1-3	1.63	0.23	3.3	0.07 NS
	≥ 4	1.55	0.07		
Duration of Courses	≤ One Weeks	1.61	0.21	0.02	0.87 NS
	> One Weeks	1.61	0.18		

NS: Non-significant at p value >0.05 ; HS: High Significant at p value <0.001

Table (4.13) showed ANOVA table for the association between working data and the overall assessment of nurses midwives practice regarding infection control, it reveals that there is a significant association between nurses midwives practice and their years of experience in nursing, in which nurses midwives with experience more than 11 years showed the highest mean of score comparing to the other categories.

Chapter Five

Discussion of the Results

5. Discussion of the Results

By utilizing the accessible literature and relevant studies, a methodologically organized, considerate yet practically consequent research study's discussion will be deliberated in the following chapter. To achieve the objectives of study, data analysis was performed by applying the inferential and descriptive statistics.

5.1. Demographical characteristics of the study samples

The study findings indicate that more than half percent (62%) of midwives aged within the twentieths, the youth ages almost always making a big contribution to the profession due to their cognitive abilities concerning follow-up of the update management in safely caring the patients specially the matter of the infection control. the results of the current study came along with a prospective follow-up study conducted by (Fashafsheh, 2015) who found that (79.04%) of study sample were in the age group of (20 - 30) years**.** Table (4.1)

Regarding the educational level of the participants, results indicate of the study indicate sample was secondary school of midwifery graduates. This is true as in our country this type of programs in preparing staff is approved for female students to engage them in different maternal and gynecology health services and institutions. Also, and this finding is agreed with (Rashaan and Abbas, 2017) who mentioned that most of their participants (60.0 %) were secondary midwifery school graduates. and secondary school of midwifery are the major programs that qualify health care providers in the scope of midwifery, especially in Iraq. Table (4.1). A previous study conducted in Maraco found that most midwives (35.1%) included in that study graduated from secondary schools (Elfaki, 2015) Table

The current study findings demonstrate that majority of the sample subjects were urban resident's findings show that (91.0 %) of the sample subjects were urban residents, that is might be due to the selection of the sample, the problem and the design of the study as the researcher needs the

maternity hospitals where she can find the possible number of the participants to conduct the study. (Table (4.1).

This finding is as well matched the results found by (Lien et al., 2018) who revealed that out of This result is compatible with (Naji, 2017) Concerning the marital status, findings show that (68.0 %) of the midwives are married. marital status is one of the vital variables in some studies and researchers expect to find some associations and connections with the other variables and results. Finding is consistent with (Jc et al., 2017) who mentioned that (59, 7%) of the sample were married. Table (4.1)

which indicated that most of sample (72.9%) of them has (> 1-5) years of experiences in nursing. Additionally, (68.0) of the sample had lesser than 5 years of experience. Regarding the years of experience, Sharma (2014) support that by their findings and mentioned that more of the participants of the study had lesser than 5 years of work (79.2%). Concerning the marital status, findings show that (68.0 %) of the midwives are married. marital status is one of the vital variables in some studies and researchers expect to find some associations and connections with the other variables and results. Finding is consistent with (Jc et al., 2017) who mentioned that (59, 7%) of the sample were married. Table (4.1)

The study findings revealed that high percentage of sample have 1-5 years of experience in nursing. About (76%) from total sample . Including this type of information about the sample is very important because people experience is usually affected by their time and years spending working in a particular area that is why midwifery has its own program and special curriculum. Table (4.2).

Study findings show that majority of the subjects have training courses in infection control and prevention, in general the training courses in nursing and midwifery now in the Iraqi health facilities become must and each according to the area of work, in regard to infection control nurses' midwives

must have at least one course annually to be in line with the up-date and progressive knowledge in this subject. Table own program and special curriculum. Table (4.2).

5.2. The study sample included the elements of their application of infection control precautions:

The Centers for Disease Control & Prevention (CDC) has a set of best practices for hospital workers who should follow for protective equipment, such as gowns; the gown should fully cover the torso to the knees and the arms to the wrists. If the arms were in the sleeves, the gown should be wrapped around the back and tied and should be waterproof.

The findings of this study reveal that knowledge responses of the midwives regarding concepts of (carefully handling of the body fluids and hand washing) are important infection prevention measures, general hygienic practices and vaccination and use of protective clothing when caring for clients, Proper cleansing and disinfection of used article and proper handling of sharps) all found as a poor knowledge. Table (4.7) .

The above practices and very serious and dangerous on the health and life of both care providers as well as the patients themselves. and become their practices are every day duty. the result inconsistence with (Robinson, 2016) who reported that their sample result is good. Concerning the use of hand hygiene material, this study clearly indicates (76%) for the different studied samples where soap and water available at all times for hand washing. This finding was in concord with a study conducted by Mehta et al,. (2011) in a delivery room in India; they found that soap and water reported as being widely available in 80% of health care sits. On the other hand, WHO has emphasized that hand wash is the appropriate method of hand hygiene after the hand found to be visibly soiled. According to further studies in the WHO, soap and water for hand washing is found to be more effective when hand is visibly soiled and the usage of alcohol hand rub does not replace the need of hand

washing (WHO.2012 From the viewpoint of the researcher fair level of hand hygiene due to count the commitment of health workers to apply hand hygiene despite the availability of hand hygiene kits because of their belief that the gloves substitute for hand hygiene and in some time, time pressure and work effect on implement of hand hygiene procedures. The current study has found that there is a significant statistical difference between health personnel practices regarding hand hygiene in different hospitals. Results of the present study agree with those of a study conducted by Mehta *et ,.al*. in 2011 in India on infection control in delivery care units. And maternal syrgical wards. The present study indicates that poor score regarding the availability of wearing the protective eye (goggles) during providing nursing care at the different studied hospitals. From the viewpoint of the researcher, lack of availability protective eye kit and education related the equipment make health personnel do not care with eye protection kits. This part deals with the concepts and of the study sample in relation to the prevention and control of infections caused by the hospital, the findings indicate that knowledge of the midwives regarding (concept of disinfection prevents hospital acquired infections, the management of used needle that should be placed in a puncture resistant container and equipment's need decontamination before sterilization) were poor. (14%). Most concepts in this regard are clearly stated by professionals and no one can ignore them because they are vital in protecting mothers and babies against the hospital acquired infections and saving their lives. Table (4.6) . It was the opposite results by (Bekele, 2018) who carried out a cross- sectional study and found out that their sample responses are good (92%).

While in regard to other items of this part of questionnaire, the results of the same study reveal that knowledge of the midwives regarding concept of (masks and goggles) was poor. Table (4.7). a descriptive quantitative design study done by (Chisanga, 2017) who reported that their sample results were fair (75.4%). While in regard to PEP (post exposure-prophylaxis)-for HCV

after exposure was poor. This result consistent with (Uchenna et al., 2015) who carried out a cross sectional descriptive study and found out that their sample responses are poor (10%).

The findings of this study reveal that knowledge responses of the midwives regarding concepts of (carefully handling of the body fluids and hand washing) are important infection prevention measures, general hygienic practices and vaccination and use of protective clothing when caring for clients, Proper cleansing and disinfection of used article and proper handling of sharps) all found as a poor knowledge. Table (4.7) .

The above practices and very serious and dangerous on the health and life of both care providers as well as the patients themselves. and become their practices are every day duty. the result inconsistence with (Robinson, 2016) who reported that their sample result is good. Concerning the use of hand hygiene material, this study clearly indicates (76%) for the different studied samples where soap and water available at all times for hand washing. This finding was in concord with a study conducted by Mehta et al,. (2011) in a delivery room in India; they found

5.3. Overall Assessment of midwife's applications of infection control precautions:

The findings of the current study indicate that the overall assessment of midwives of their application of infection control precautions: was fair, in general this might be due to the sample size besides the overall is the accumulation of all the assessment levels with including the details, moreover this is something worthy. The result inconsistence with (Goje et al., 2018) that carried out a cross-sectional study and fortunately identified the same variables, they found that most of sample knowledge was in very high levels regarding the standard precaution measures**.**

5.4. Discussion of the study sample practices level of items

The present results reveal that the practices of the midwives regarding contacted with blood, fluids or contaminated items) was good. This similar to a descriptive case study done by (Paudel et al., 2017) who reported that their sample results were good (90%).

The same study findings illustrate that most of the midwives' practices in terms of (wear goggles to protect the eyes during a procedure that generates spray of blood or body fluids) was evaluated as moderate. Some of our health personnel may not consider this measure as serious one or they might be busy do not have time to wear or put them off. And from the viewpoint of the researcher, lack of availability protective eye kit and education related the equipment make health personnel do not care with eye protection kits. Table (4.5).

The present study findings show that high percentage of the midwives' practices (wear mask to protect the nose and mouth) calculated moderate results. Using masks to protect oneself and others become a very usual health behavior nowadays as this behavior proves its effectiveness in avoiding the transmission of so many viruses. While (Ibrahim, 2016) found that most of the participants reported poor practices (95%).

National Health and Medical Research Council in 2016 in Australian has recommended that a spill kit should be readily available in each clinical area and should include scoop and scraper, single-use gloves, protective apron, surgical mask and eye protection, absorbent agent, clinical waste bags and ties, and detergent; all parts should be disposable to ensure that cross-contamination does not occur .From the researcher point of view, some of the supplies like spillage kits and personnel protective equipment used during cleaning the contaminated blood and body fluid were not available in many delivery rooms at the studied hospitals.

Additionally, some hospitals lack health staff trained to deal with blood and other body fluid spillages. These were the major factor influencing different practices associated with the studied hospitals. According to the recommendations of a study conducted by the infection control team in the National Health Services of Scotland, it is important that adequate training be given to all staff members involved in the management of blood and body fluid spillages to ensure both the protection of the staff member undertaking the cleaning and all others who may be affected by the spillage.

The present study reveals that the practices of the midwives regarding (management of Sharps material in a Solid Container) were poor. It is one of the important infection control precautions that is crucial to protect all health personnel as well as patients who avoid mixing the different wastes together and this will make it difficult to dispose, hospitals and other health agencies are provided with special boxes for this type of wastes. All the studies in this regard considered and included this measure, one of these studies done by (Gulilat, 2014) and were found that it was not matching the present study results when it was reported poor assessment among their participants**.** Table (4.6).

The study findings reveal that the practices of the midwives concerning (Needles & syringes are disposed of as a single unit) was Poor. Table (4.7). Nurses, midwives and others who are in close contact with such instruments cannot take risk and avoid exposing themselves to risk. The result was found in many studies as with (Health et al., 2017) who declared that their sample results were good (44.6%).

The present study reveals that the practice of the midwives related (to put on the protective device during collection and transportation of hospital waste) was poor. Table (4.7). The present study reveals that the practice of the midwives related (to put on the protective device during collection and transportation of hospital waste) was poor. This result was not compatible with

(Tabatabaei et al., 2016) who reported that their sample results was good (100%). The study findings show that most of the midwives' practices (to wear a gown properly for every procedure) was poor. Table (4.5).

This result was inconsistent with (Alshammari et al., 2018) who reported that their sample results was good (77.9%). Table (4.8). This result is do not agree with (Tabatabaei et al., 2016) which indicated that most of respondents stated good results (75%).

The same study findings illustrated that subjects found good in the practice of (emptied or disposed of the containers when they are three quarters full). Fortunately, this health behavior as well as the others is crucial in the subject matter of infection control. On the other side and in the study conducted by (Tabatabaei et al., 2016), it was found that sample only disclosed fair results (50%) which considered as inconsistent. The study findings indicate that almost midwives' practices related the item (Select glove appropriate to task) was moderate. While this result was inconsistent with (Bekele, 2018) who indicated that their sample results was just fair (46.7%).

And this results regarding (evaluation of midwives' practice regarding environment) was opposite to a study done by (Akagbo et al., 2017) who reported that their sample assessment was moderate. The study findings show that most of the midwives' practices. Was poor or anyway it was available. Table (4.9). This result was consistent with (Geberemariyam et al., 2018) who reported that their sample results was poor (52.2%).The existent study reveals that the practices of the midwives regarding (the containers availability where needles or other sharps are used) were poor. Assessment

5.5. Discussion of the overall Midwives 'practices Assessment toward infection control and prevention

The findings of the current study indicate that the overall assessment of midwives' practices was poor, this result is do not agree with study done by (Ismail et al., 2019) and showed that their sample was practiced in a good

level. Discussion of the factors influencing midwife utilization of infection control and prevention measures.

The same findings show that high percentage of study subjects responded as fair level of evaluation in regard to how is the factor of shortage of staffing influence the midwife's utilization of infection control and prevention measures. This result is supported by (Heba et al., 2018)) who found out that most of their respondents were fair (33.3%).

Concerning the fact if (non-availability of relevant equipment) affect the performance of participants study findings demonstrate that most of them reported fair means that equipment for somehow is available which is encouraging result. This result is inconsistent with (Goje et al., 2018) who reported that their sample result was good (50.4%) .

5.6. Discussion of Assessment of midwives' practice regarding environment

Concerning the factors related to the (All elements in the working environment) study findings show that majority of sample were found to evaluate those factors influencing midwife was poor. Working in environment is a parameter for measuring the competency of nursing care provided by professionals and somehow is affected by the those professional experiences. This result is compatible with (Zeb, 2019) who indicated that most of the study respondents were poor.

From the viewpoint of the researcher, Lack of awareness of the health hazards related to healthcare waste, inadequate training in proper waste management, absence of waste management and disposal systems, insufficient financial and human resources, and the low priority given to the topic were the most common problems connected with health-care waste. All staffs had a responsibility to dispose healthcare waste in a way that poses minimal hazard to patients, visitors, other healthcare workers, and the community.

The study findings indicate that there is a non-significant relationship between midwives' practices and demographical characteristics. This might be due to the sample size or some confronting factors, moreover the subject of infection control and its prevention measures become a very common one and every day concern that people deal with particularly in the maternal wards.

As well the result agreed with a study conducted by (Baqer et al., 2014) who mentioned that there was no significance relationship at P>0.05 between nurse's (age, gender, years of employment in the hospital, and training course of nosocomial infection) and nurse's knowledge toward nosocomial infection, but only with the educational level.

5.7. Relationship between overall Assessment of the Midwives practices and their sociodemographic data:

This study indicates that there was non-significant relationship between the demographic data and all midwives' practices. The practices mean the exposure to the procedures frequently and for long time which make those midwives more serious with this infection transmission precautions regardless to their personal characteristics. (Ibrahim et al., 2016).

There was significant difference regarding training course in midwifery and disagreement with residency. While there were non-significant difference concerning their age, marital status, educational level, years of experience in nursing, shift, , number of course in infection control, and training course in infection control and prevention and working unit , as well the result disagreed with a study conducted by (Fashafsheh et al., 2016). who mentioned that there was a significant difference regarding age, education, work experience, marital status, experience and department. Through the present chapter, the results of the study were carefully discussed with supporting evidences provided by available the literatures and in relation to the objectives of the study.

Chapter Six

Conclusions and Recommendation

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Conclusions

Based on results of the present study, it is concluded that:

1 .Majority of midwives ages for frequency from (20-30) and consist from total number (62.0), and the majority of midwives have less than 10 years of employment in the delivery and curettage rooms and maternal wards. And less than 5 training course of infection control.

2 .The nurse-midwives have a poor level of practices toward the infection control precautions at the obstetric wards in Al Najaf Hospitals .

3 .There was non-significant relationship between nurses-midwives' practices and there demographic characteristics, only the training courses there was significant relationship .

Recommendations

Based on the early stated conclusions, the current study recommendation the following:

1 .Guidelines and protocols for infection control and prevention based on international standards should be available and updated to all healthcare facilities providing maternity care

2 .Intensive training courses programs can be applied to provide the nurse-midwives (especially those of low and new experience) with details about infection control precaution

3 .Further studies is needed it to investigate the effect of courses or training programs upon the nurse midwives related to the infection control awareness. and initiating and encouraging more intervals regular training courses and continuing education programs for all midwives about infection control and prevention and at regular

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Appendices

Appendices (A)

University of Babylon
College of Nursing
Research Ethics Committee

جـامـعة بـابـل
كـلية التمريـض
لجنة اخلاقيات البحث العلمي

Issue No:

Date: / /2022

Approval Letter

To,
Hanan Noor Mohammad

The Research Ethics committee at the **University of Babylon, College of Nursing** has reviewed and discussed your application to conduct the research study entitled "**Evaluation of Infection Control Precautions Measures By: Nurses Midwives Working in the Maternal Surgical Wards in Al_ Najaf Al-_ shraf City Hospitals**"

The Following documents have been reviewed and approved:

1. Research protocol
2. Research instrument/s
3. Participant informed consent

Committee Decision.

The committee approves the study to be conducted in the presented form. The Research Ethics committee expects to be informed about any changes occurring during the study, any revision in the protocol and participant informed consent.

Prof. Dr. Salma K. Jehad
Chair Committee
College of Nursing
Research Ethical Committee
5 /7/2022

خبراء تحكيم استمارة الاستبانة

ت	اسم الخبير	اللقب العلمي	الاختصاص والشهادة	مكان العمل	سنوات الخدمة
1	د. قحطان هادي حسين	أستاذ	دكتوراه / تمريض صحة الاسرة والمجتمع	جامعة بابل / رئاسة الجامعة	34
2	د. امين عجيل ياسر	استاذ	تمريض صحة الاسرة والمجتمع	جامعة بابل / كلية التمريض	34
3	د. حسن علوان بيعي	أستاذ	بورد دكتوراه/ طب الاسرة والمجتمع	كلية الحلة الجامعة / قسم التمريض	41
4	د. كافي محمد ناصر	أستاذ	تمريض صحة الاسرة والمجتمع	كلية الطوسي الجامعة / قسم التمريض	41
5	د. فاطمة وناس خضير	استاذ	تمريض صحة الاسرة والمجتمع	جامعة الكوفة / كلية التمريض	29
6	د. الاء محمد صادق	استاذ	بورد دكتوراه / طب النسائية والتوليد	جامعة الكوفة / كلية الطب	25
7	د. مرتضى غانم عداي	استاذ	دكتوراه / تمريض صحة الاسرة والمجتمع	جامعة وارث الانبياء / كلية التمريض	19
8	د. منصور عبد الله فلاح	أستاذ	تمريض صحة الاسرة والمجتمع	جامعة الكوفة / كلية التمريض	19
9	د. علي عبد الزهرة صاحب	أستاذ	دكنواره /علوم طبية	جامعة الكوفة / كلية التمريض	15
10	د. نضال عباس مجيد البغدادي	طبيبة استشاري	بورد دكتوراه/ طب مجتمع	دائرة صحة النجف	38
11	د. هاشم جبار الزرفي	أستاذ مساعد	دكتوراه لغة عربية	كلية الطوسي الجامعة / قسم التمريض	8

Appendices(C)

Republic of Iraq
Al-Najaf Al-Ashraf Governorate
Najaf Health Directorate
Training and Human Development Center

No.
Date:

جمهورية العراق
محافظة النجف الأشرف
دائرة صحة النجف

مركز التدريب و التنمية البشرية
العدد: ٢١٤١
التاريخ: ٢٠٢٢/٧/٨

إلى/ جامعة بابل/كلية التمريض

م / تسهيل مهمة

تحية طيبة ...

إشارة إلى كتابكم ذي العدد 2473 في ٢٠٢٢/٧/٦بخصوص تسهيل مهمة الباحثة طالبة الدكتوراه (حنان نور محمد ياسر) للحصول على الموافقة الاخلاقية لإجراء البحث العلمي الموسوم:

Control precausion mesurers by nurses midwives working in the maternal surgical wards in Al Najaf Al ashraf city hospitals

حصلت موافقة اللجنة العلمية للبحوث في مركز دائرتنا على إجراء البحث في (مستشفى الفرات الاوسط التعليمي مستشفى الزهراء التعليمي، مستشفى الحكيم العام مستشفى السجاد العام) في دائرتنا مع التأكيد على الالتزام الكامل بتعليمات السلامة الحيوية والضوابط الاخلاقية والحصول على موافقة المشاركين قبل الشروع بالبحث والحفاظ على خصوصيتهم وعدم افشاء البيانات او استخدام العينات لغير اغراض البحث العلمي ... على أن لا تتحمل دائرتنا أية تبعات مادية ولا يسمح بإخراج العينات خارج مختبرات المؤسسة.

للتفضل بالاطلاع .....مع الاحترام

الدكتور حيدر خضير عباس

د/ احمد عباس طاهر الاسدي
المدير العام/وكالة
٢٠٢٢/٧/٨

دائرة صحة النجف
الصادر
قسم الامور الادارية والمالية والتدقيق

سخة منه إلى/
- مكتب المدير العام / للعلم مع الاحترام .
- مركز التدريب و التنمية البشرية /شعبة ادارة المعرفة والبحوث..... مع الأوليات
-مستشفى الحكيم العام مستشفى الامام السجاد العام ، مستشفى الفرات الاوسط التعليمي ، مستشفى الزهراء التعليمي/ ..... تسهيل مهمة الباحثة... مع لاحترام

تسلسل الاستمارة ١٦٣

Appendices(D)

Appendix D2 Questionnaire English Version

Nurses- Midwives Practices Towards Infection Control Precautions at Wards in Al Najaf Hospitals.

Part* 1*- Demographic characteristic of the study sample:

AGE:

20 – 30 years ☐

31 – 40 years ☐

41-50 years ☐

51 years and above ☐

EDUCATIONAL LEVEL:
Nurse:

Nursing school *graduate* ☐

Secondary nursing school ☐

Secondary midwifery school ☐

Midwifery institute ☐

Nursing institute ☐

B.Sc. in nursing and above ☐

Residency:

Urban ☐ Rural ☐

MARITAL STATUS :

Single ☐

Married ☐

Divorced ☐

widow ☐

others ☐

Part2 Work related data:

Years of experience in nursing:

1-5 years ☐

6 – 10 years ☐

11 and more ☐

W*orking experience in the *maternal surgical wards:

1-5 years ☐

6 and more ☐

-Training courses related in infection control precautions:

Yes : ☐ No: ☐

If the answer is yes, the number of courses:

1-3 ☐

4 and more ☐

Duration of courses:

1 week ☐

2 week and more ☐

Appendices(D)

Part 3: observational check list regarding infection control precautions:

Item	1-Hand Hygiene	observation		
		1st	2nd	3rd
1	Health provider routinely washes hand before procedure			
2	Health provider routinely washes hand after procedure			
3	Soap and water available at all times for hand washing			
4	Health provider vigorously rub hand with antiseptic and/or water before aseptic procedure such as wound dressing			
5	Health provider nails are short, clean & free from nail extensions & varnish			
6	Health provider are not worn wrist watches, stoned rings or other wrist jewelry during clinical procedures			
7	Hand washing facilities are clean and intact (check sinks, taps, splash backs, soap & towel dispensers)			
8	Posters promoting hand hygiene are on display (including 'how to' posters by sinks)			
9	Clinical staff are encouraged to use moisturizers that are pump operated or personal use only			
10	Soft absorbent paper towels are available at all hand wash sinks			

Item	Part 4-Personal Protective Equipment	observation		
1-Health provider have trained in the use of personal protective equipment as part of local departmental induction		1st	2nd	3rd
	1-*Gloves*:			
1	Select glove appropriate to task			
2	Sterile (surgical gloves) are used for performing sterile procedures (wound dressing, suturing)			
3	Sterile and nonsterile gloves (examination gloves) are available			

4	Non-sterile disposable gloves are used for contact with non-intact skin, any body fluids, or mucous membranes.			
5	There is an appropriate range of sizes available			
6	Wear the correct size of gloves			
7	Clean hands before putting on gloves for a clean/aseptic procedure			
8	Hands are decontaminated following removal of gloves			
9	Changed gloves between patients			
10	Gloves are worn as single use items and discarded immediately for each clinical procedures or episode of patient care			
11	Change or remove gloves if moving from a contaminated body site to a clean body site within the same client/patient/resident			
12	Frequently gloves worn before and after for procedures			
13	Gloves are stored appropriately			
14	Select glove appropriate to task			
Item	***2-Gowns or Aprons***	**observation**		
1	Health worker wear a cover gown / apron during the procedures	**1st**	**2nd**	**3rd**
2	Gown / apron available for use			
3	Changed gowns / aprons between patients			
4	Gowns fluid proof			
5	Do the gowns have long sleeves			
6	Protective eye (e.g., goggles) are available			
7	Wear Protective eye during procedures			

8	Protective Closed toe shoes or shoe covers (e.g., booties) available			
9	Wear Protective Closed toe shoes or shoe covers during vaginal deliveries			
10	Protective Clean face masks are available			
11	Wear Protective Clean face masks during vaginal deliveries procedures			
12	Protective Clean overhead (hair cover) are available			
13	Wear protective clean overhead (hair cover) during procedure's			

Item	**Part 5-Prevention of sharp injuries**	**Observation**		
		1st	**2nd**	**3rd**
1	Health provider received training in sharps/ splash/ bite injury management and are aware of the actions to take following an injury			
2	Sharps containers are available at the point of use			
3	Sharps containers are correctly assembled, labelled with date, locality & signed			
4	The are no inappropriate items (swabs/ packaging/ gloves) in the sharps container			
5	Needles & syringes are disposed of as a single unit			
6	Syringes with a residue of prescription medication are disposed of according to current legislation			
7	The temporary closure mechanism is used when the bin is not in use			
8	Sharps containers are visibly clean with no, dust, dirt or debris			

Item	**Part 6-contamination with blood/ body *fluids***	**o**bservation		
		1st	**2nd**	**3rd**
1	Cleaning body fluid			
2	Personal Protective equipment is available (aprons, gloves, masks)			
3	Equipment used to clear up body fluid is disposable or able to be decontaminated			
4	Medical equipment which has been contaminated with body fluids is cleaned appropriately and a permit to work document			

	completed (eg. Decontamination certificate/ label)			
5	Furniture which has been contaminated with body substances and cannot be cleaned is condemned			

Item	**Part 7-*Waste Management***	**observation**		
		1st	**2nd**	**3rd**
1-	Health provider have attended a training session which includes information about the correct & safe disposal of waste			
2	The waste storage area is clean & dry			
3	All plastic waste sacks are fully enclosed within bins to minimize the risk of injury			
4	All waste bins used are lidded, foot operated and in good working order			
5	Waste bags are removed from clinical areas daily			
6	Disposal of Sharps in a Sharps Solid Container			
7	Disposal of Gloves in a Red Bag			
8	Disposal of Swabs and Other Contaminated Materials in a Container with Red Bag			
9	Disposal of Non contaminated Materials in a Black Bag			
10	There is no emptying of clinical waste from one bag to another			
11	There are no overfilled bags- bags are no more than 2/3 full			

Item	**Part 8- *Environment***	**observation**		
		1st	**2nd**	**3rd**
1	Overall appearance of the environment is tidy &uncluttered with only appropriate, clean and well-maintained furniture			

	used			
2	Fabric of the environment and equipment smells clean, fresh & pleasant			
3	The complete floor, including edges and corners are visibly clean with no dust, body substances, dirt or debris			
4	Furniture, fixtures &fittings are visibly clean with no body substances, dirt, dust, debris or adhesive tape			
5	All dispensers, holders (couch roll, toilet paper, soap & alcohol gel) are visibly clean with no dirt, dust, debris, body substances or adhesive tape			
6	Toilets are visibly clean with no body substances, dust, lime scale stains, deposits or smears- including beneath toilet seat and raised toilet seats			
7	Waste receptacles are clean, including lid & pedal			
8	Medical equipment is cleaned, maintained and stored appropriately			
9	Pillows are enclosed in a washable and impervious cover			
10	Couches and Chairs are free from rips and tears			
11	Tables are tidy and free from clutter to enable cleaning			

Appendices(D)

أنتم مدعوون للمشاركة بمشروع بحث علمي بعنوان:

"ممارسات الممرضات القابلات الاحترازية اتجاه السيطرة على العدوى في الردهات النسائية في مستشفيات النجف "

يرجى أن تأخذ الوقت المناسب لقراءة المعلومات الآتية بتأنٍ قبل أن تقرر إذا ما كنت راغباً بالمشاركة أم لا. وبإمكانك طلب مزيداً من الإيضاحات أو المعلومات الإضافية عن أي أمر مذكور بالاستمارة أو عن الدراسة من الباحث أو اي مختص أخر.

أولا : معلومات البحث	
اسم الباحث	**حنان نور محمد الياسري**
اسم المشرف	**د.سلمى كاظم جهاد**
أهداف البحث :	1. To identify the sociodemographic characteristics and job related data of the Nurses midwives 2. To evaluate the infection control precautions measures practiced by nurses midwives working in the maternal surgical wards in Al Najaf Al-shraf city hospitals. 3. To find out the relationship between the infection control precautions measures taken by midwives' and their demographic data **1.** 4-To find out the relationship between the infection control precautions measures taken by midwives' and their job related data s**.**
الفترة المتوقعة لمشاركة الشخص في البحث	20-30 دقيقة (
الاجراءات المتبعة في جمع العينات	ملئ الاستمارة الاستبيانية بواسطة المشتركين او تسجيل المقابلة بواسطة الباحث
المخاطر المتوقعة كنتيجة للمشاركة في البحث	لا يوجد
الفوائد التي ستعود على الشخص مقابل الاشتراك في البحث	يمكن التحقيق في تحديد وتقدير العوامل التي أثرت في انتقال العدوى بين العاملين في التمريض ، بالإضافة إلى استكشاف كيفية تجربة الفريق الصحي لهذه العوامل التي يمكن قياسها من خلال استخدام طريقة الملاحظة والتدقيق والمراقبة للسيطرة على المعوقات التي تمنع تطبيق الاحتياطات القياسية تلك و لتحسين اداء

العاملين في الموسسات الصحية

ثانيا: معلومات للشخص المشارك بالبحث	
1.	**ان المشاركة في هذا البحث طوعية**
2.	**بامكانك سَحب مشارَكتك من الدِراسة متى شئت ولأي سبب**
3.	**من حقك ان لا تجيب عن اي سؤال لا ترغب باجابته**
4.	**ان مشاركتك بالبحث لن تحملك اي نفقات مالية**
5.	**ان مشاركتك بالبحث لا يترتب عليها اي مسائلة قد تضر بك شخصيا أو بعملك.**
6.	**ان اسمك سيكون سريا و إن المعلومات الناتجة عن مشاركتك سوف تعامل بسرية تامة ولن يطلّع عليها أي شخص ما عدا الباحث والمشرف ولجنه الاخلاقيات عند الضرورة.**
7.	**وأن المعلومات التي ادليت بها والنتائجالعلمية لهذا البحث هي للأغراض العلمية فقط ولن تكون هناك أية إشارة إلى لك أو لعائلتك في أي منشور عن هذه الدراسة.**
8.	**ان من حقك بمعرفة النتائج العامة للبحث، او اي نتائج تتعلق بك بصورة خاصة.**

ثالثا: معلومات الاتصال
في حال وجود اي استفسار او شكوى من قبلك حول مشروع البحث بامكانك الاتصال بالباحث أو لجنة اخلاقيات البحث في جامعة بابل – كلية التمريض
اسم الباحث حنان نور محمد **رقم الهاتف07806262779** **البريدالالكتروني hanan.mohamed.nurh56@student.uobabylon.edu.iq**
لجنة أخلاقيات الابحاث العلمية – جامعة بابل – كلية التمريض: **رقم الهاتف** **البريد الالكتروني**

اسم المشترك بالبحث:	في حال كون عمر الشخص المشارك اقل من 18 سنة، او كونه غير قادر على فهم أو قراءة الاستمارة يرجى توقيع ولي أمره الشرعي. اسم ولي أمر المشترك:

ترفق الاستمارة او المقياس الذي سوف يستخدم لجمع العينة

Appendix E Questionnaire Arabic Version

بسم الله الرحمن الرحيم

عنوان البحث

ممارسات الممرضات القابلات الاحترازية اتجاه السيطرة على العدوى في الردهات النسائية في مستشفيات النجف "

الجزء 1 :الخصائص الديموغرافية لعينة الدراسة:

العمر:

20 - 30 سنة ☐

31 - 40 سنة ☐

41-50 سنة ☐

51 سنة فما فوق ☐

المستوى التعليمي للممرضة :

خريجة مدرسة التمريض ☐

مدرسة التمريض الثانوية ☐

مدرسة القبالة الثانوية ☐

معهد القبالة ☐

معهد التمريض ☐

بكالوريوس. في التمريض فما فوق ☐

الاقامة

الحضر ☐ ☐

الحالة الزوجية:

عزباء ☐

متزوجة ☐

مطلّقة ☐

أرملة ☐

أخرى ☐

<u>جزء 2:</u> البيانات المتعلقة بالعمل:

سنوات الخبرة في التمريض

1-5 سنوات ☐

6 - 10 سنوات ☐

11 فأكثر ☐

خبرة العمل في ردهات جراحة النسائية:

1-5 سنوات ☐

6 وأكثر ☐

الدورات التدريبية المتعلقة باحتياطات مكافحة العدوى:

نعم ☐

لا ☐

إذا كان الجواب نعم عدد الدورات:

1-3 ☐

4 وأكثر ☐

مدة الدورات:

أسبوع 1 ☐

2 أسبوع فأكثر ☐

Appendices(D)

جزء3: تطبيق احتياطات السيطرة على العدوى

العنصر		الملاحظة		
	1-نظافة اليدين	م1	م2	م3
1	الممرضة والقابلة / تغسل يدها بشكل روتيني قبل الإجراء			
2	الممرضة والقابلة / / تغسل يدها بشكل روتيني بعد الإجراء			
3	الصابون والمياه متوفرة في جميع الأوقات لغسل اليدين			
4	الممرضة والقابلة تفرك يديها بالماء/او المطهر قبل الإجراءات المعقمة مثل الضماد.			
5	أظافر الممرضة والقابلة / قصيرة ونظيفة وخالية من وصلات الأظافر والطلاء			
6	لا يتم ارتداء ساعات المعصم أو المحابس ذات الفصوص أو أي من مجوهرات المعصم خلال الإجراءات السريرية			
7	مرافق غسل اليدين نظيفة وسليمة (التحقق من الأحواض والصنابير والصابون وحاويات المناشف)			
8	توجد ملصقات تعزيز العادات الصحية معروضة (بما في ذلك ملصقات كيفية التصريف)			
9	يتم تشجيع الممرضة والقابلة / على استخدام المرطبات التي تعمل للاستخدام الشخصي فقط			
10	المناشف الورقية الناعمة الماصة متوفرة في جميع اماكن وجود احواض غسل اليدين			

Appendices(D)

العنصر	الإجراءات	الملاحظة		
	جزء 5 : الوقاية من الإصابات الحادة	م1	2م	3م
1	يتلقى جميع الكادر التمريضي تدريب على معالجة جروح الأدوات الحادة وانتشار المواد وقرصها و لديهم وعي في الإجراءات التي يجب اتخاذها بعد الإصابة			
2	تتوفر حاويات الأدوات الحادة عند مواضع الاستخدام			
3	يتم تجميع حاويات الأدوات الحادة وتلصق عليها اسماؤها مع التاريخ والمكان والتوقيع			
4	لا توجد عناصر غير لائقة (على سبيل المثال؛مسحات / التعبئة والتغليف / القفازات) في حاوية الأدوات الحادة			
5	يتم التخلص من الإبر والمحاقن ذات الاستعمال الواحد			
6	يتم التخلص من الحقن مع بقايا ا لأدوية الموصوفة وفقا للتشريعات المتبعة			
7	تستعمل آلية الإغلاق المؤقتة للحاويات التي ليست قيد ا لاستعمال			
8	حاويات الأدوات الحادة نظيفة بشكل واضح مع عدم وجود غبار وأوساخ أو حطام			

العنصر	الإجراءات	الملاحظة		
	جزء 6 : التلوث بالدم / سوائل الجسم			
1	المستلزمات المخصصة للانسكاب متاحة لغرض تطهير وتنظيف سوائل الجسم المتسربة	1م	2م	3م
2	معدات الحماية الشخصية متاحة (مآزر،والقفازات،والأقنعة،وحماية العين)			

3	تكون المعدات المستخدمة لأزاله سوائل الجسم المتسربة من ذوات الاستعمال لمرة واحده او مما يمكن تطهيره				
4	يتم تنظيف المعدات الطبية التي تلوثت بسوائل الجسم بشكل مناسب والتصريح النهائي الموثق للعمل جاهز (على سبيل المثال شهادة إزالة التلوث / ملصق)				
5	تستبعد الأثاث التي تلوثت بمواد الجسم والتي لايمكن تنظيفها				

العنصر	جزء -7 - ادارة النفايات			الملاحظة
	الإجراءات			
1	شمول الممرضات والقابلات بدورات تدريبية تضمنت معلومات حول التخلص الصحيح والآمن من النفايات	1م	2م	3م
2	منطقة تخزين النفايات نظيفة وجافة			
3	وضعت جميع أكياس النفايات البلاستيكية بإحكام داخل الصناديق لتقليل خطر الإصابة			
4	جميع صناديق النفايات المستخدمة هي بغطاء وتشغيلها بالقدم و بحالة عمل جيدة			
5	تتم إزالة أكياس النفايات من المناطق السريرية يوميا			
6	التخلص من الأدوات الحادة في حاويات الأدوات الحادة الصلبة			
7	التخلص من القفازات في احدى الحقائب الحمراء			
8	التخلص من المسحات وغيرها من المواد الملوثة في وعاء ذو حقيبة حمراء			
9	التخلص من المواد غير الملوثة في حقيبة سوداء			
10	لا يتم تفريغ النفايات الطبية من حقيبة إلى أخرى			
11	لا توجد أكياس مملوءة أكثر من اللازم - الأكياس لا تزيد عن 3/2			

العنصر	الإجراءات	الملاحظة

Appendices(D)

جزء 8 : البيئة				
1	يكون المظهر العام للبيئة أنيقا ومرتبا وملائما وتستعمل الأثاث النظيفة والمصانة جيدا	1م	2م	3م
2	أقمشة البيئة ومعداتها نظيفة وذات رائحة جيدة وجذابة			
3	الأرضية بصورة عامة ،بما في ذلك الحواف والزوايا نظيفة بشكل ملحوظ مع عدم وجود الغبار والمواد الجسمية والأوساخ والحطام			
4	الاثاث والمفروشات والتجهيزات نظيفة بشكل ملحوظ مع عدم وجود مخلفات الأجسام والأوساخ والغبار والحطام أو اية اشرطة لاصقة			
5	تكون كل آلات الادوات والماسكات (مثل لفة الأريكة وورق التواليت والصابون والكحول والجل) نظيفة بشكل ملحوظ مع عدم وجود الأتربة والغبار والحطام ومخلفات الأجسام أواي اشرطة لاصقة			
6	المراحيض نظيفة بشكل ملحوظ مع عدم وجود مواد او كتل وغبار وبقع على نطاق والجير ومقاعد التواليت أولطخات – بمافي ذلك ما تحت مقاعد المراحيض والبارز منها.			
7	اوعية النفايات نظيفة وذات غطاء و دواسة			
8	المستلزمات الطبية نظيفة ومصانة و مخزنة تخزينا لائقا			
9	وضعت الوسائد في غطاء قابل للغسل ومنيع			
10	الأرائك والكراسي خالية من التشققات وقطرات الماء			
11	المناضد مرتبة و خالية من اية فوضى مما يتيح تنظيفها			

المستخلص

تعد العدوى التي تتطور أثناء الولادة سببًا مشتركًا للمراضة والوفيات خلال الفترة المحيطة بالولادة والأمومة. تغيير سلوك العاملين الصحيين ومحيط المؤسسة داخل النظام الصحي أمرًا حيويًا لخفض انتشار العدوى. تعتمد تدابير مكافحة العدوى بشكل مهم على وجود موظفين مؤهلين تأهيلا عاليا ومطلعين كقابلات وممرضات

تم إجراء هذه الدراسة الوصفية – المقطعية للفترة من 4 تشرين الثاني 2021 إلى 13 اذار 2023 لتقييم تدابير السيطرة على العدوى بواسطة الممرضات القابلات . تم اختيار عينة (العدد = 100) من مستشفيات النجف الأشرف، مستشفى الفرات التعليمي (25)، مستشفى الزهراء التعليمي (30)، مستشفى السجاد العام (15) ومستشفى الحكيم العام (30) لتحقيق اهداف الدراسة. تم تصميم وتنظيم استبانة ملاحظة وتدقيق بعد اطلاع الباحثة الواسع للأدبيات ذات العلاقة. تشتمل على الخصائص الديموغرافية والمهنية للقابلات الممرضات.

أظهرت نتائج الدراسة أن متوسط درجات الممارسات الاحترازية الشاملة لمكافحة العدوى لجميع المجالات كان (1.59). كما أظهرت نتائج الدراسة الحالية أن متوسط درجة الممارسات العامة للمبحوثين حول نظافة اليدين بلغ (1.87). وكانت الدرجة الإجمالية للممارسة على معدات الوقاية الشخصية (1.35). كانت درجة الممارسة الإجمالية للعباءات أو المآزر (1.96) كانت درجة الممارسة الإجمالية حول الوقاية من الإصابات الحادة لاحتياطات مكافحة العدوى ((1.56) كانت درجة الممارسة الإجمالية حول التلوث بالدم / سوائل الجسم (1.43) درجة الممارسة الإجمالية حول إدارة النفايات كان (1.44). وأخيراً كانت الدرجة الإجمالية للممارسة في مجال البيئة (1.54). اظهرت النتائج أيضًا وجود علاقة إيجابية ذات دلالة إحصائية بين الحالة التعليمية للمشاركين ودرجة ممارساتهم الإجمالية ، كما تم العثور على علاقة إيجابية هامة أخرى بين الحالة الاجتماعية والممارسات. (R = 103.78, p. value =0.000)

(R = 7.86, P. value = 0.001)

وقد خلصت الدراسة إلى أن الممرضات القابلات لديهن مستوى ضعيف من الممارسات. أما بالنسبة للتوصيات الرئيسية فيمكن تطبيق الدورات التدريبية المكثفة لتزويد الممرضات والقابلات (خاصة ذوات الخبرة المنخفضة والجديدة) بتفاصيل حول احتياطات مكافحة العدوى

جمهورية العراق
وزارة التعليم العالي والبحث العلمي
جامعة بابل/ كلية التمريض

ممارسات الممرضات ـ القابلات الاحترازية اتجاه السيطرة على العدوى في ردهات النسائية في مستشفيات مدينة النجف

أطروحة مقدمة الى مجلس كلية التمريض جامعة بابل لنيل درجة الدكتوراه في فلسفة التمريض

من قبل الطالبة
حنان نور محمد

بأشراف
أ . د. سلمى كاظم جهاد

1444رمضان نيسان 2023