Deanship of Graduate Studies
Al-Quds University

Neonatal Nurses Practices Related to Infection Control at Neonatal Care Units at Governmental Hospitals in Gaza Strip

Mohammed Abdallh Mohammed Alhelou

M. Sc. Thesis

Jerusalem-Palestine

1444- 2023

Neonatal Nurses Practices Related to Infection Control at Neonatal Care Units at Governmental Hospitals in Gaza Strip

Prepared by
Mohammed Abdallh Mohammed Alhelou

BSc. of General Nursing Sciences- Palestine College of Nursing, Gaza, Palestine

Supervised by:
Dr. Mohammad Al-Jerjawi
Dr.Ashraf Al-Jeddi

A thesis Submitted in Partial fulfillment of the requirement for the degree of Master of Pediatric Nursing/Faculty of Health Professions-Al-Quds University

1444-2023

Al-Quds University

Deanship of Graduate Studies

Pediatric Nursing Program/Nursing Department

Thesis Approval

Neonatal Nurses Practices Related to Infection Control at Neonatal Care Units at Governmental Hospitals in Gaza Strip

Prepared by: Mohammed Abdallh Mohammed Alhelou
Registration No.: 22011734

Supervised by: Dr. Mohammad Al-Jerjawi & Dr.Ashraf Al-Jeddi

Master thesis submitted and accepted. Date:23/05/2023
The names of signatures of examining committee members are follows:

1.Head of committee: Dr. Mohammad Al-Jerjawi Signature.....

2.Head of committee: Dr.Ashraf Al-Jeddi Signature.....

3.Internal examiner: Dr. Hamza Abdeljawad Signature.....

4.External examiner: Dr. Khalil Shuaib Signature.....

Jerusalem-Palestine

1444- 2023

Dedication

I dedicate this project to God Almighty, my creator, my strong pillar, my source of inspiration, wisdom, knowledge, and understanding.

To my amazing mother and father, without whom I would not be the person that I am today, thank you for being amazing role models, for always encouraging my dreams, and for all of the sacrifices you made in order for me to live the life I have.

To my beloved wife, Taghreed, I appreciate the sacrifices you made in helping me achieve my dream.

To my son Ahmed and my beautiful daughters Diala, Diana, Maram,and Nervana, who are the joy of my life, for their patience and support.

To the stars that shine in my heart and fill it with love and respect, my dear brothers and sisters Ahed, Zahed,Marvet,Shreen. Raed,Yasmeen, Neema, Fadel, and Khetam, I thank you for being my cheerleaders and for standing with me.

My friends, relatives, and everybody who encourages me to finish this hard work

To my homeland Palestine

To the Holy Land of Jerusalem

To whom it was too soon to say, you inspire me every day to advocate for those who cannot advocate for themselves.

I dedicate this work to all of them.

Signed: Mohammed Abdallh Mohammed Alhelou

Declaration

I certify that this thesis submitted for the degree of Master is the result of my own research, except where otherwise acknowledged, and that this thesis (or any of its parts) has not been submitted for higher degree to any other university or institution.

Signed: ……  ……

Mohammed Abdallh Mohammed Alhelou

Date: 23/05/2023

Acknowledgement

I would like to express my great thanks and gratitude to all those who contributed to the success of this endeavor toward the master's degree. Without their support, this work would not have been possible. I deeply address my sincere thanks to my supervisors, Dr. Mohammad Al-Jerjawi and Dr. Ashraf Al-Jeddi. I thank you for your patience, guidance, correction, and support.

Special thanks to Dr. Ramadan Hassan for his great help and assistance.
My sincere thanks extend to all nurses who participated in this study.

I also extend my thanks and gratitude to those who helped me collect the questionnaires, especially nurses Khaled Al-Hinnawi and Taghreed Al-Zahar, for they are my love and gratitude.

Finally, my deepest thanks must also go to the Ministry of Health and to my colleagues for their cooperation.

Mohammed Abdallh Mohammed Alhelou

Abstract

Neonates are a vulnerable group that requires special attention and precautions while in the hospital. Neonatal mortality remains an issue globally, there are approximately 6700 neonatal deaths every day in 2020. Regrettably, most deaths are due to conditions that can be prevented with appropriate neonatal care. Nurses play a vital role in observing the signs and symptoms of neonatal infection, which is very important for early diagnosis and intervention. The study aimed to assess neonatal nurses' practices related to infection control at neonatal care units at governmental hospitals in the Gaza Strip. The study design was a quantitative, descriptive cross-sectional, conducted at the neonatal care units affiliated with the government hospitals. The study sample involved 167 respondents, and the questionnaire was dispersed among them at six governmental hospitals in the Gaza Strip. The results showed that out of 167 respondents, more than half (51.5%) were female, and the highest age group was those above 35 years old (37.1%). The highest group in the level of education was the bachelor's qualification mean percentage of 79%; The results showed that the neonatal nurses had a high level of hand washing practice, with an average percentage of 86.62%. As for washing hands after using the computer and telephone inside the units, the average rate was 76%. Also, the percentage of hand rubbing practice is 81.74%. While a rate of 82.14% was about waste disposal methods and 71.46% was about the use of physical barriers, about sterilization and disinfection practices, with an average rate of 82.4% and about the factors influencing adherence to infection control, with an average rate of 74.12%. The study recommended the continuation of training courses on infection control practice through educational and training programs and regular lectures for neonatal nurses in order to maintain and obtain a better infection control practice.

Table of contents

List of Tables

List of Figures

List of Annexes

List of Abbreviations

CDC	Centers for Disease Control and Prevention
COVID-19	Coronavirus disease 2019
ECDC	European Center for Disease Prevention and Control
GNN	Gaza Neonatal Network
GS	Gaza Strip
HAIs	Hospital Acquired Infections
HCAIs	Healthcare-associated infections
HCWs	Health Care Workers
ICUs	Intensive Care Units
Ig	Immunoglobulin
IPC	Infection prevention and control
LBWT	Low birth-weight
MMS	Military medical services
MOH	Ministry of Health
NCUs	Neonatal Care Units
NGOs	Non-Governmental Organizations
NICUs	Neonatal Intensive Care Units
PCBS	Palestinian Central Bureau of Statistics
PPE	Personal protective equipment
SP	Standard Precautions
SPSS	Statistical Package for Social Sciences
TLRs	Toll-Like Receptors
UNICEF	United Nations Children's Emergency Fund
UNRWA	United Nations Relief and Work Agency
WHO	World Health Organization

Chapter One

Introduction

1.1 Background

Neonates are a vulnerable group that requires special attention and precautions while in the hospital. Their immune systems are still not as developed as adults. As a result, they are more susceptible to infection than others. Infectious disorders account for a large portion of pediatric morbidity and mortality (Jong, Strunk & Burgner, 2017).

Neonatal immune systems are immature. With the exception of immunoglobulin IgG to particular maternal antigens that are passively delivered over the placenta during the last trimester of pregnancy, they have incredibly low immunoglobulin (Ig) levels. Neonatal T cell function in innate immunity is mostly unaffected, while complement activity is only half that of healthy adults. Neonatal and adult toll-like receptors (TLRs), receptors that sense the presence of microorganisms, have similar basal expression because neonates have a limited neutrophil storage pool and their current neutrophils have a diminished ability to move from the circulation to sites of infection. The clinical manifestation of neonatal infectious illnesses reflects these immunological issues. Neonates exhibit rapid and fulminant illness progression, diffuse clinical symptoms of infection, and challenging-to-interpret laboratory findings, including hematological and immunological indicators of infection and inflammation. neonates with low birth weight (LBWT) have weakened immune systems and are more susceptible to illness (Steinbach et al., 2013).

The first 28 days of a neonate's life are known as the neonatal period. It is considered an integral indicator of future neonate survival and well-being as well as sustainable social and economic development at a broader level, according to the United Nations Children's Emergency Fund (UNICEF, 2015). Globally, hospitalized neonatal illness morbidity and mortality are significantly influenced by the incidence of neonatal infectious diseases. According to the World Health Organization (WHO), neonatal mortality is an important issue since a significant portion of under-five deaths occur during the neonatal period. These deaths are mostly from preventable and treatable causes. Worldwide, there are 6700 neonatal deaths every day, or 47% of all child deaths under the age of five (WHO, 2020).

At hospitals in the Gaza governorate, nosocomial infections represent a significant burden for both neonatal patients and neonatal nurses. Nosocomial infections are responsible for about 10% of pediatric hospital admissions. According to the Ministry of Health (MOH), in the Gaza Strip (G.S), there were 546 infectious disease-related deaths in 2022, which accounted for 9% of all deaths. In addition, 22 deaths occurred in children under the age of five, accounting for 4% of all infectious disease-related mortality, and recorded 325 new cases of mumps, with an incidence rate of 15.4 per 100,000 of the population. The number of registered cases of viral hepatitis (A) reached 353, with an incidence rate of 16.8 per 100,000 population. The incidence of meningococcal meningitis decreased to 0.3 per 100,000 population. The incidence of bacterial meningitis with other types of bacteria was 5.2 per 100,000 population. 185 cases of unclassified meningitis were detected in the Gaza Strip, with an incidence rate of 8.8 per 100,000 of the population which has led to the rise in nosocomial neonatal infections (MOH, 2022).

Neonates are more likely than any other age group to develop an infectious disease. While some research in industrialized nations claimed that the incidence of neonate infection varied from 1 to 5 cases per 1000 live births, other population-based studies in developing nations showed infection rates ranging from 49 to 170 per 1000 live births (Medhat &Khashana, 2017).

Monitoring neonatal infections' symptoms and signs is essential for early intervention, and neonatal nurses are major players in infection control. In order to avoid infection, all neonatal nurses should be continuing their training in an education program about infection control (Hockenberry, Rodgers, & Wilson, 2016).

The "nucleus of the health care system" in neonatal care units are the neonatal nurses, who make up the majority of health care workers (HCWs). The fact that they interact with neonates more frequently than any other HCWs suggests that their adherence to hand-washing guidelines is crucial for lowering the risk of disease transmission among neonatal patients (Nair et al., 2014).

The neonatal nurses who work in the neonatal care unit must be skilled and experienced in the management of neonatal infections. Septicemia and neonatal mortality will result if nurses don't use infection control measures (Murphy et al., 2014).

1.2 Research problem

The study's goal is to assess neonatal nurses' practices related to infection control at neonatal care units at governmental hospitals in the Gaza Strip. More explanation is needed about nursing practice in infection control in neonatal care units (NCUs) in order to bridge the gap between the recommended best practices. According to the infection control protocol of the Ministry of Health in the G.S and the reported nurses' practice of assessing infection control among neonates and improving care for neonates experiencing an infection, The study's specific goals were to find out: how they practice infection control methods; what hand washing practices and hand rubs they use; what waste disposal methods they use; what methods of sterilization and disinfection of instruments and surfaces they use; how they use physical barriers; and what relationship there is between the various domains of infection control.

1.3 Justification of the study

Neonatal infectious diseases are life-threatening diseases worldwide. To reduce the incidence rate, safe care should be assessed for how neonatal nursing practices regarding infection control and providing effective neonatal nursing practices. This plays an important role in infection reduction in neonates and reducing deaths. It also helps avoid the life-threatening conditions that continuously affect at-risk neonates. This research on neonatal nurse practices has the aim of determining how neonatal nurse practices affect infection control at governmental hospitals in the G.S. This emphasizes the urgent need to understand the practices of nurses about neonatal infection control and complications, as well as deaths due to neonatal infection diseases.

1.4 The overall aim

The aim of the study is to assess neonatal nurse’s practices related to infection control at neonatal care units at governmental hospitals in G.S.

1.5 Objectives of the study

1. To assess the current neonatal nurse practices related to infection control measures at neonatal units.
2. To identify the factors affecting the neonatal nursing practice of preventive measures for hospital acquired infections in neonatal care units in the G.S.
3. To compare various safety practices among the respondents in the neonatal units.
4. To assess the neonatal nursing practice regarding prevention of hospital acquired infections in neonatal care units in the G.S.
5. To determine the relationship between practice and socio-demographic variables.

1.6 Questions of the study

1. What are neonatal nursing practices regarding the control of hospital-acquired infections in neonatal care units in the Gaza Strip?

2. What are the levels of neonatal nurses' practices in infection control at the neonatal unit?

3. Is there a significant difference in the practice of safe neonatal care among neonatal nurses regarding the spread of infections in neonatal care units at governmental hospitals in the Gaza Strip?

4. What are the factors affecting the nursing practice of preventive measures for hospital acquired infections in neonatal care units in the Gaza Strip?

5. Is there a relationship between infection control practices and age, gender, qualification, years of experience working in unit and training on infection control practices?

1.7 Operational definitions

1.7.1 Neonatal Nurse

Neonatal nurses who deal with premature neonates, neonates with birth defects, infections, or neonates with low birth weight up to 28 days following delivery They work mostly in the neonatal care unit. This describes nurses employed with a minimum of six months' experience working in a neonatal care unit.

1.7.2 Prevention measure

It is a practical, evidence-based approach that protects neonate's patients and health workers from exposure to preventable infections. Infection prevention and control affect all aspects of health care, including hand hygiene, waste disposal, surgical site infections, and sterilization and disinfection of instruments.

1.7.3 Safe practice

Safe work practices are written methods in the protocol in force in the Ministry of Health in the Gaza Strip that define how to perform a task with minimum risk to health workers, patients, equipment, materials, and the environment.

1.7.4 Infection control nursing practices

refers to all those neonatal nursing activities intended to reduce the risk of hospital-acquired infections, as well as those neonatal nursing practices that are supported by values that direct how nursing care is delivered. Using a self-administered questionnaire, neonatal nurses' stated performance levels in controlling hospital-acquired infections at NCUs will be assessed.

1.8 Context of the study

1.8.1 Geographical context

Palestine has a surface area of 27,000 KM2, extending from Ras Al-Nakoura in the north to Rafah in the south, according to the Palestinian Central Bureau of Statistics (PCBS). Palestine's borders are Egypt to the south, the 1948 occupied regions to the north and east, and the Mediterranean Sea to the west. The Gaza Strip (GS), a small area of territory that was annexed by Israel in 1948, is surrounded on the east and north by the occupied territories, on the east and south by Egypt, and on the west by the Mediterranean Sea. Gaza, Mid-Zone, Khan Younis, Rafah, and North Gaza make up the five governorates that make up GS as following in (Annex 1) (PCBS, 2021).

1.8.2 Demographic Context

The Arab nation of Palestine is a small one. About 27,000 km2 is the whole area of historical Palestine. When Palestine was conquered by Israel in 1948, it was split geographically into the West Bank, which has 5,655 km2, the Gaza Strip, which has 365 km2, and East Jerusalem (PCBS, 2021).

1.8.3 Population

At the end of 2021, the State of Palestine had an average population density of 878 people per square kilometer (km2), with 557 people living in the West Bank and 5,855 in the Gaza Strip (refugees making up 66% of the Gaza Strip's population). The Gaza Strip now has one of the world's highest population densities as a result of the influx of refugees. The Israeli occupation created a buffer zone along the Gaza Strip's eastern border that extends more than 1,500 meters, despite the Gaza Strip's modest size. Also, the Gaza Strip's ongoing siege, one of the world's density populated regions, contributed to a substantial increase in unemployment there. As a result, the unemployment rate rose to 47%; by the end of 2021, 69% of youngsters between the ages of 15 and 24 will be jobless. The siege also affected the Gaza Strip's economy, with 53% of its inhabitants becoming impoverished or below the poverty line (PCBS, 2021).

1.8.4 Health sector in Gaza strip

There were 34 hospitals in the GS, of which 13 were for the Ministry of Health, of which the population of this study will be distributed in the general hospitals, which contained neonatal units, as follows: Al-Shifa Hospital consists of a special care baby unit (SCBU) and NICU; Al-Aqsa Hospital is divided as follows: Pediatric A Department, Pediatric B Department, SCBU, and neonatal unit; Nasser Hospital is divided as follows: Pediatric Emergency Department, Pediatric A Department, Pediatric B Department, and neonatal unit; European Gaza Hospitals is divided as follows: Pediatric Surgery Department, Pediatric Medical Department, Pediatric Emergency Department, neonatal unit, and Pediatric Intensive Care Unit (PICU). Another specialist hospital in the pediatric Al-Rantisy/Al-Naser Hospital and Al-Emirati Hospital. The United Nations Relief and Work Agency (UNRWA), Military Medical Services (MMS), non-governmental organizations (NGOs), and the private health sector are the other major health providers in GS. In GS,

there are 36 hospitals in total, including 3 private hospitals, 14 NGOs, 14 MMS, and 17 NGOs. There are 3338 beds total in these hospitals. 45 for private hospitals, 2616 for MOH, and 172 for MMS. GS has 146 neonatal beds overall, compared to 124 at MOH. Admissions at MOH hospitals were 161,965 in 2020 (MOH, 2021).

A lot of primary healthcare facilities are also present in the G.S. MOH covers 52 of these institutions, while UNRWA supervises 22 facilities. Only for refugees, UNRWA offers primary healthcare; those who face financial difficulties must purchase supplemental healthcare. A few tertiary, secondary, and basic services are offered by non-governmental organizations. With a range of specialty hospitals and research facilities, the private, for-profit sector offers three levels of treatment (MOH, 2021).

1.8.5 Neonatal Care Unit in Gaza Governmental hospitals

The Gaza Neonatal Network (GNN) reports that there are seven hospitals in GS that have neonatal intensive care units (NCUs): European Gaza Hospital, Al-Shifa Complex, Al-Nasser Pediatric Hospital, Al-Emirati Hospital, Al-Aqsa Hospital, and Al-Tahreer Hospital, Kalal-Edwan. In 2022, 875 neonates were admitted to NCUs overall. Basic neonatal care, special neonatal nursery care, and intensive neonatal care are the three categories of neonatal care offered by this institution. A high level of neonatal care is intensive care (GNN, 2022).

Chapter Two

Conceptual Framework & Literature Review

2.1 Conceptual Frameworks

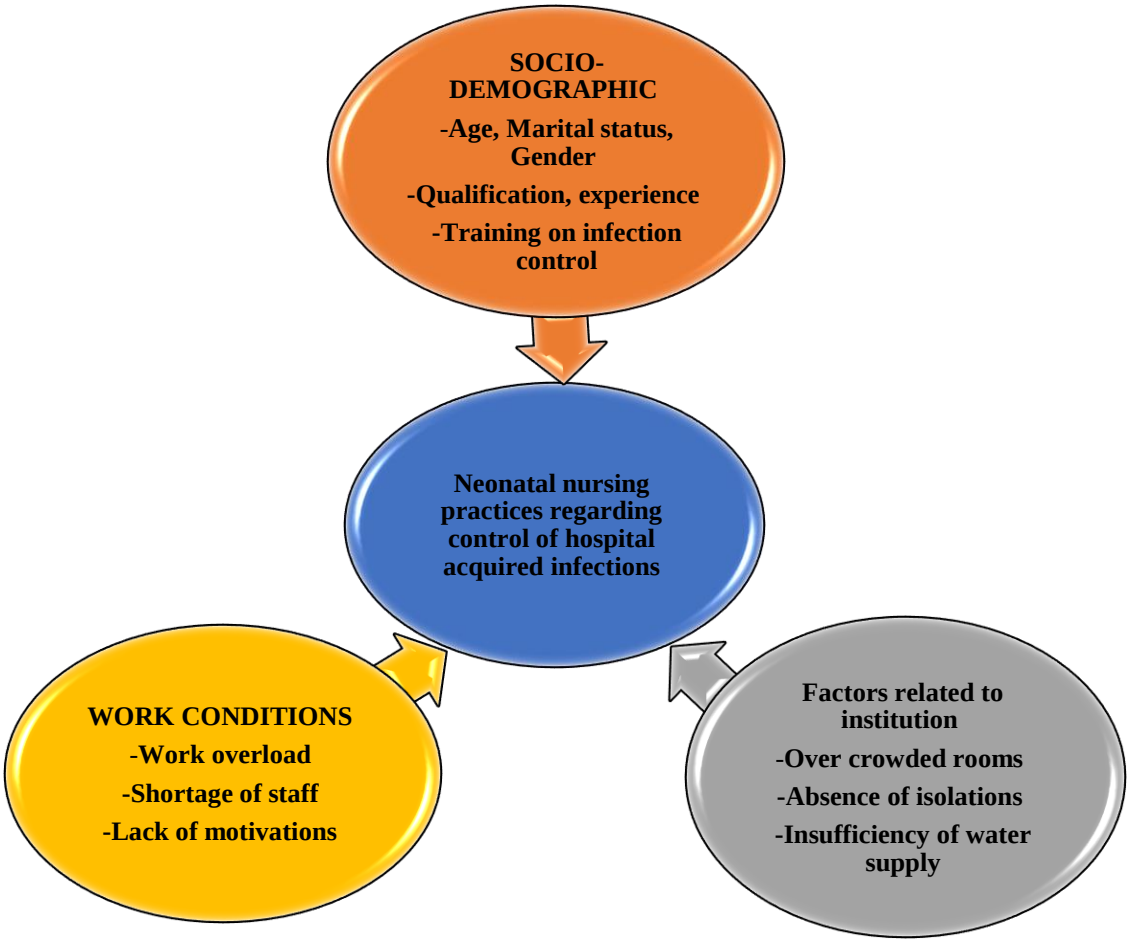


Figure (2.1): Conceptual framework diagram (self-developed)

The self-developed conceptual framework shown in the present study is composed of several concepts, namely, the factors affecting neonatal nursing practice regarding control of hospital-acquired infections, and those factors are socio-demographic, work conditions, and factors related to the institution (neonatal care unit setting). Other concepts are the nursing practices of preventive measures for hospital-acquired infections. The following items were included in the domain: The practice of healthcare workers toward infection control was evaluated as the dependent variable. The independent variables include age, sex, marital status, degree of education, and work experience, as well as institutional influences (training about infection control, availability of infection prevention supplies).

2.2 Literature Review

This part provides details from a review of the literature on the practice of infection control among neonatal nurses as a crucial method of preventative measures used to reduce hospital-acquired infections. This part contains factors affecting the neonatal nursing practice of infection control, a conceptual framework, and summary.

2.3 Chain of infection

To understand how an illness starts, spreads, and how to take action to break the cycle's chain links, neonatal nurses should be familiar with each component of the infection cycle. Breaking the infection chain is seen as one of the essential elements of preventing infection. as following in figure (2.2).

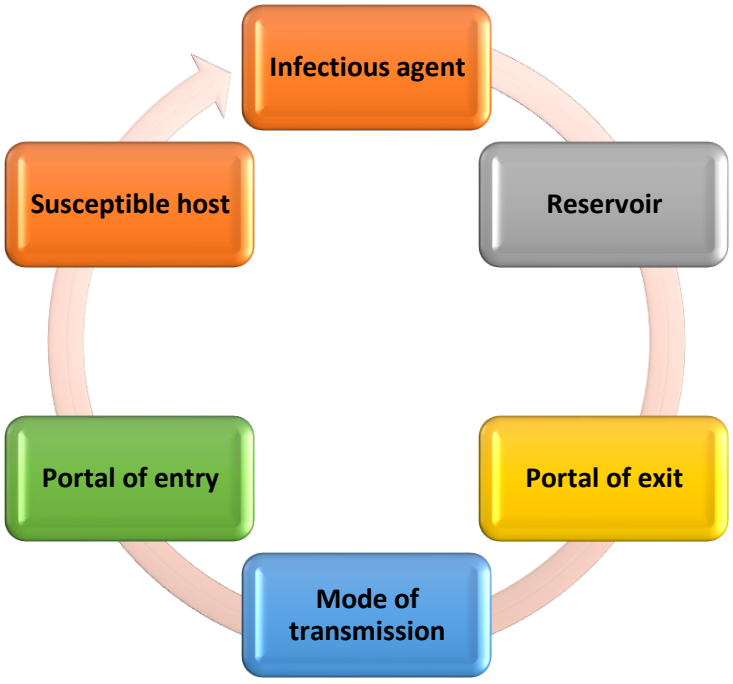


Figure (2.2): Breakage of the infection chain

Infectious agent: is a pathogen (germ) that causes diseases**. Reservoir:** Are the safest places for the microbe to live that causes the disease? May live in soil, water, air, humans, animals, and other medical tools used with patients. **Portal of exit:** The way by which pathogens are released, such as through mucous membranes, the respiratory system, spray, secretions, the urinary system, the gastrointestinal tract, and places of surface or deep wounds. **Mode of transmission:** a process of transmission of infectious agents to the host.

Portal of entry: The way by which the infectious agent enters the body of a healthy person, such as through the mucous membrane, urinary system, respiratory system, and digestive system. **Susceptible host:** A person who is infected by the pathogenic microbes. Maybe a provider of health care, patients, and visitors according Centers for Disease Control and Prevention (CDC, 2012).

2.4 Infection prevention and control

Infection prevention and control (IPC) is a realistic, evidence-based strategy for avoiding preventable infections that could damage patients and healthcare professionals (WHO, 2020).

2.5 Healthcare-associated infections

These healthcare-associated infections (HCAIs) include pneumonia associated with ventilators, bloodstream infections associated with central lines, and urinary tract infections associated with catheters (CDC, 2020).

2.6 Standard precautions

Regardless of whether a patient has a suspected or confirmed infection, all patient care must adhere to the basic minimum standards for infection prevention measures. These procedures are made to guard against and stop the spread of illnesses among patients. Handwashing is a common precaution. personal protection equipment (PPE) according to risk, safe injection techniques, sharps management and injury prevention, safe handling, cleaning, and disinfection of patient care equipment, environmental cleaning, waste management, and aseptic technique (CDC, 2020).

a set of safety measures created to reduce the spread of microorganisms through blood or other body fluids. Throughout each patient's stay in the hospital, they are applied by all healthcare professionals. Regardless of whether they contained blood or not, they are applied to all bodily fluids and secretions. The mucous membranes and skin were also covered by them. A minimum of during the patient's care, these are thought of as a fundamental set of infection protection precautions to be followed (Olmsted, 2016).

2.6.1 Safe injection practices

While preparing and administering parenteral (i.e., intravenous or intramuscular injection) drugs, safe injection practices are meant to avoid the spread of infectious diseases between patients or within a patient. A set of guidelines known as "safe injection practices" should be followed by medical professionals while administering injections to patients. When administering local anesthesia, direct healthcare professional communication most often handles parenteral medications. During this procedure, the dental cartridge syringe is cleaned and heat sterilized between patients, and needles and cartridges containing local anesthetics are used for just one patient. The use of parenteral drugs in conjunction with fluid infusion devices is the main application of the other safe procedures listed here (CDC, 2020).

2.6.2 Hand hygiene

The process of washing one's hands to get rid of germs, bacteria, viruses, grease, and other undesired or hazardous substances that have stuck to them. Although wet and moist hands are more easily decontaminated, drying the cleaned hands is a step in the procedure. If soap and water are not available, hands can be sanitized with hand sanitizer that is at least 60% alcohol in water, provided that the hands are not obviously overly unclean or greasy. In the home and in other settings, it is crucial to practice good hand hygiene to stop the transmission of infectious diseases (CDC, 2020).

2.6.2.1 The Five Moments for Hand Hygiene

The WHO developed the "Five Minutes for Hand Hygiene" method to reduce the possibility of pathogens being transmitted from a healthcare worker to a patient or the environment (WHO, 2020).

Figure (2.3): The Five Moments for Hand Hygiene

2.6.3 Personal protective equipment

Protective clothes, helmets, gloves, face shields, goggles, facemasks, respirators, and other pieces of gear are all considered personal protection equipment (PPE). PPE is frequently used in medical facilities like hospitals, doctor's offices, and clinical labs. When worn correctly, PPE creates a barrier between your skin, mouth, nose, and eyes and infectious substances, including bacterial and viral pollutants (mucous membranes). The barrier may prevent the spread of pathogens from respiratory secretions, bodily fluids, or blood. PPE can shield individuals with medical conditions like immunodeficiency or those who are at

high risk of infection following surgery from coming into contact with substances or possibly infectious material that visitors and healthcare professionals may bring in. When done correctly and in conjunction with other infection control techniques like hand washing, the use of alcohol-based hand sanitizers, and concealing coughs and sneezes, it helps to reduce the transfer of infection from one person to another. To effectively use PPE and prevent infecting both the user and others, contaminated PPE must be removed and properly disposed (Food and Drug Administration, 2017).

2.6.3.1 Gloves

Gloves are an example of personal protective equipment that is used to protect the health care provider and/or the patient from the transmission of microorganisms during procedures and examinations that could potentially result in infection or disease. One element of an infection-control plan is the use of gloves (Food and Drug Administration, 2017).

2.6.3.2 Medical face mask

A medical face mask, also known as a surgical or procedure mask, is a piece of equipment that covers the patient's mouth, nose, and chin to form a barrier that stops communicable diseases from being transferred from the patient to the healthcare workers. It is used by members of the public and medical professionals in accordance with CDC recommendations; it is not personal protective equipment. Face masks are not a substitute for surgical masks, N95 respirators, or other filtered facepiece respirators because they might or might not meet any fluid barrier or filtering efficiency criteria, providing the wearer with fluid barrier protection in addition to respiratory protection (CDC, 2020).

2.6.4 Antiseptic agent

An antiseptic is a substance that chemically inhibits or stops the development of bacteria on the body's surface, thereby assisting in the prevention of illness. A chemical substance that slows or inhibits the growth of microorganisms on the bodies outside surfaces and aids in infection prevention is used for hand washing. used for hand washing: In hospitals and other healthcare facilities, hand rubs containing chlorhexidine gluconate and povidone-iodine solutions are frequently used. Pathogens like the SARS-CoV-19 virus are destroyed by alcohol in quantities greater than 60%. Antiseptics can be used to clean intact skin

before surgery as part of preoperative skin disinfection (to reduce the risk of surgical site infections) or a procedure such as intravenous cannulation. Mucous membrane disinfection: antiseptic irrigations may be instilled into the bladder, urethra, or vagina to cleanse the cavity prior to a medical procedure such as catheterization (Food and Drug Administration, 2017).

Rationale for Aseptic Technique

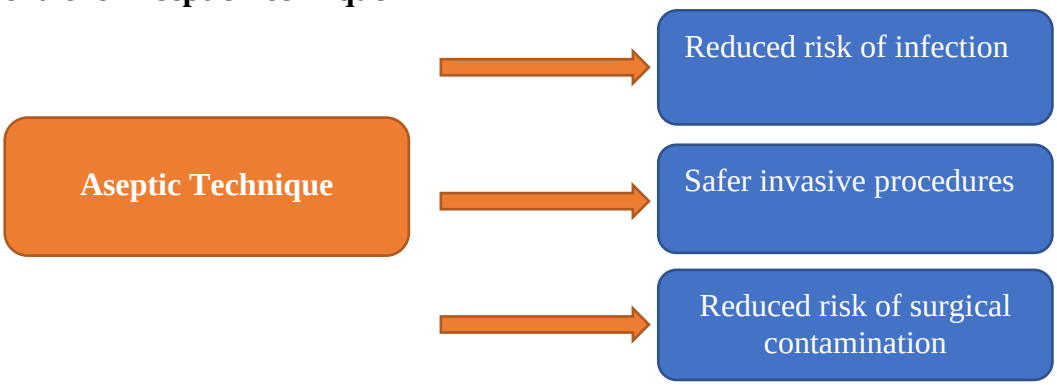


Figure (2.4): Cleaning and disinfection and sterilization of patient care equipment

2.6.4.1 Sterilization

A procedure used in healthcare facilities to physically or chemically remove all microbial life. Pressured steam and dry heat (CDC, 2020).

2.6.4.2 Disinfection

Describes a procedure that removes most or all pathogenic microbes from inanimate items, with the exception of bacterial spores. Typically, liquid chemicals or wet pasteurization are used to disinfect objects in healthcare settings. The effectiveness of disinfection may be limited or eliminated depending on the numerous factors that affect the procedure (CDC, 2020).

2.6.4.3 Cleaning

Is the process of removing visible soil (such as organic and inorganic particles) from items and surfaces. It is often carried out manually or mechanically using water, detergents, or enzymatic solutions. Prior to high-level disinfection and sterilization, the surfaces of the instruments must be thoroughly cleaned since organic and inorganic residue reduces the efficiency of these procedures. Decontamination rids things of harmful bacteria so they can be handled, used, or thrown away (CDC, 2020).

2.6.5 Environmental Infection Prevention and Control

Policies and methods for regularly sanitizing and cleaning environmental surfaces should be part of the infection prevention plan. Prior to disinfection, it is generally advised to properly clean surfaces because doing so gets rid of many germs. Disinfection is a less harmful approach to microbial inactivation than sterilization and typically eliminates practically all recognized pathogenic germs, though not always all microbial forms, such as bacterial spores (CDC, 2020).

2.6.6 Waste management

The total waste stream from major healthcare establishments and from minor scattered healthcare activities (WHO, 2020).

2.6.6.1 Why Segregate Healthcare Waste?

To reduce the amount of waste that must be treated as hazardous waste, to reduce the risks of exposure to hazardous healthcare waste for workers, and to make possible the recycling of non-hazardous general waste (WHO, 2020).

2.6.7 Sharps Disposal Containers in Health Care Facilities

Sharp's disposal containers are made of strong, leak-proof plastic or metal with puncture-resistant sides and bottoms. They also have a snug, puncture-resistant lid with an aperture big enough to fit a sharp but tiny enough to keep a hand out. Things with sharp ends or edges that can pierce or harm skin include needles, syringes, lancets, auto injectors, infusion sets, and connecting needles (Food and Drug Administration, 2017).

2.7 Literature review Previous study

2.7.1 Practice of neonatal nurses concerning infection control

Ezike et al., (2021) conducted a study in Enugu, Nigeria, hospitals with fifty-eight neonatal nurses to determine the prevalence of infection control practices among nurses working in neonatal care units. The study found that while most nurses did not practice effective hand washing, they did a good job of disposing of waste in a proper manner. It was just appropriate to use physical barriers between the nurses. Nevertheless, their techniques for

decontaminating the equipment were insufficient. Nursing practices among the various infection control measures considerably varied, according to an analysis of variance ($p > 0.05$).

Ogoina et al, (2015) conducted a study on nurses working in neonatal care units, and the results showed that 63.6% of the respondents washed their hands after removing gloves they had used on patients, while 82% claimed they donned gloves when taking blood samples or administering intravenous therapy. In addition, 63.6% of respondents stated they tossed spent needles in sharps disposal containers; 7.9% said they bent syringe needles after use; and 33.7% said they covered syringe needles after use. According to the study's findings, Nigerian health facilities must include prevention resources.

Abd-Elaziz and Abd-Elmawgood, (2021) Conducted a study in Egypt, to determine the effect of evidence-based infection control guidelines on neonatal nurses' practices in the neonatal intensive care unit. A pre/post-quasi-experimental research design was utilized to meet the aims of this study. There was a significant increase in the mean total performance scores after one month of the program (119.20 ± 6.14) compared with the mean scores before program initiation (82.07 ± 8.95) ($p < 0.001$). The study concluded that can be improved by implementing evidence-based infection prevention and control guidelines.

Okechukwu and Modteshi, (2012) conducted a study in Nigeria, carried out a study among workers in healthcare institutions. The results found that 97.9% said that they wash their hands with water and soap after dealing with patients. Also, 97.8% wore gloves before dealing with patients for possible transmission of infection from patients through body fluids or secretions. While 69% wore masks when they provide health services to patients, and 88.4% wore gowns to prevent possible infections such as splattering of blood, body fluids and secretions.

In the government hospitals of the G.S, Al Shareef (2020) conducted a study to determine neonatal nurses' knowledge and practices on standard precautions (SP) and those with reference to sharp injuries. There were no statistically significant variations between respondents' opinions and descriptions of neonatal nurses' knowledge and practice of SP. On the other hand, there were statistically significant differences (P-value = 0.000) between participants who had received SP training and the location of such instruction, as

well as between participants' knowledge of SP measures. More training programs on infection management are required, according to the study's findings.

In Palestinian hospitals, a study on the knowledge and practice of neonatal nursing with regard to infection control methods found that the majority (91.1%) of the sample had good practices. Conclusion: The study's nurses demonstrated good levels of infection control practice (Ayed, 2015).

Nist et al., (2022) study has been conducted Intended to prevent infection among neonatal patients, universal gloving also hinders the provision of human touch. Of the 137 responses, only 22.1% of neonatal nurses reported unit policies requiring universal gloving. While nurses reported some ambiguity about glove policies, surveyed neonatal nurses commonly used gloves when performing general care activities. Institutional gloving policies varied in this geographically diverse sample, but routine bare-handed touch was an uncommon practice among neonatal nurses. Research evidence is needed to guide nursing practice and inform policy decisions regarding glove use in the neonatal care unit.

Hassan et al. (2020) determined that the practices of neonatal nurses in relation to infection control were poor. Following the program's adoption, neonatal nurses' practices showed a statistically significant improvement. Most nurses (87.0%) stated high levels of significance of satisfaction with their engagement. Activate hospital infection control committees, and combine them with audits, training, assessments of neonatal deaths, and feedback on infection rates in upper Egyptian hospitals.

2.7.2 Nursing practice of infection control for hospital-acquired infections

Infections acquired in the hospital but appearing after discharge are included in this group (WHO, 2021). Moreover, poor IPC methods found in water, food, and the surroundings of a hospital setting distribute healthcare-associated infections to both neonate’s patients and health personnel (Haque et al., 2018).

A study done by Mehta (2014) has found that observation of hand hygiene, following SP to reduce transmission and strategies to reduce hospital acquired infections are critical in NCUs infection control.

A study was done to assess the remaining selected procedures for infection control in NCUs facilities. A study was done in Isfahan to assess how well neonatal nurses understood hospital infections and how to sterilize surfaces and hand tools in NCUs. It was shown that, on average, 63% of neonatal nurses were educated about hospital infections. A study in a tertiary hospital in Ghana examined the communication and hygienic practices of the neonatal nurses in the NCUs. Patient contact, hand washing technique, and hand hygiene practices were all observed by neonatal nurses. According to the analysis of this researcher, neonatal nursing practices received low marks. Yet, the participants in the current study found that 42% of them have strong practices (n = 31), while 38% have poor practices (Deshmukh et al., 2014).

Gamil Alrubaiee (2017) conducted research to find out neonatal nurses' knowledge and practices on nosocomial infection control methods in hospitals in Sana'a, Yemen. The findings also showed that 71% of nurses had fair practices for nosocomial infections, 26% had good practices, and only 3% had bad practices. According to the study's findings, there is a need to build a relationship and implement a regular training program to upgrade and update nurses' knowledge and practices related to nosocomial infection prevention methods.

Abou et al., (2023) conducted a study to evaluate the compliance of NCUs neonatal nurses with basic infection control practices. A below-average compliance percentage (66.7%) was found, with the highest compliance rate for disposing of sharp objects into sharps boxes (86.2%) and the lowest compliance rate for disposing of sharps boxes other than when they are full (27.6%).

There were fewer hospital-acquired infections in the ICU when invasive procedures like central lines, tracheal intubations, airway suctioning, and urine catheterizations were managed with respect for sterility. Identifying sources of organisms, detecting organisms, and occasionally isolating sick individuals are all steps in the prevention of hospital-acquired infections in specific categories of patients, such as burned patients and other patients at high risk (Lukas, 2016).

2.7.3 Compliance relating to the use of PPE

Several types of PPE are advised for various processes, and the decision depends on the anticipated exposure, durability, and appropriateness of use (CDC, 2016). PPE includes, among other things, respirators, gloves, and full-body suits.

The proper use of advised PPE is still below par despite its demonstrated usefulness in preventing nosocomial infections. According to Gulilat, Ethiopian PPE usage is often quite low. (36%, approximately). Just 73% of respondents in the same survey reported donning gloves, when necessary, even though the usage of gowns during procedures was best (99%). No matter the neonate's patient state, just 31.1% of neonatal nurses said they had put on gloves. It was reported that only 15.8% of people were wearing headgear (Gulilat, 2014).

According to a study by Haile, the majority of HCWs utilized PPE depending on the chance of exposure and the neonatal patient's diagnosis, which supported the trend. In addition, 88.7% of the respondents stated that they always wore gloves when there was a chance of coming into contact with infectious body fluids, while just 32.4% of the respondents always wore PPE, regardless of the patient's illness. It was found that the effectiveness of donning waterproof goggles and an apron was only about 50% (Haile et al., 2017).

Okello et al., (2017) studied the barriers and factors affecting the use of PPE in Uganda. From their findings, 2% of the 59 respondents were not aware of the purpose of PPE; 13% of the HCW did not use PPE when indicated; and among those who donned protective gear, 10% used an inappropriate one. Moreover, 23.7% of the respondents did not know how to properly don and doff PPE. Among the barriers to compliance were the unavailability of adequate PPE, poor fitting, substandard gloves, and a lack of training on PPE usage**.**

Shauq et al., (2014) conducted a study on nurses` knowledge about universal precautions in the neonatal intensive care unit at Baghdad city. The study revealed that nurses` knowledge about general information, PPE, soiled patient-care equipment, needles and other sharps, and patient placement (isolation) were good. In general, of the total sample, 71.4 percent have an accepted level of knowledge, while 28.6 percent have good knowledge regarding all aspects of universal precautions.

2.7.4 Health worker determinants of infection control

Karaaslan (2014) conducted a study to determine the level of hand hygiene compliance among neonatal nurses working in neonatal intensive care units. Compliance as a whole was 37.0%. When compared to waterless, alcohol-based hand hygiene (36.3%), neonatal nurses were more likely to use soap and water (63.6%).

Ismail (2016) conducted a study to evaluate how neonate's nurses use standard precautions. The overall mean knowledge score toward standard precautions is 68.4%, but the mean practice score is 47.4%. 89.3% of staff had good awareness of hand hygiene moments; 53.6% were aware of hand washing steps, but only 32.1% actually practiced them correctly. While 85.7% of the neonatal nurses had knowledge of the use of personal protective equipment and fresh gloves, only 67.8% wore them in practice. In Libya, neonate's nurses have little understanding of and poor adherence to recommended infection control measures. To enhance neonatal nurses' knowledge and practice, it is crucial to create infection control policies and protocols that reinforce their training on common precautions.

Infection control compliance levels were significantly connected with age, sex, occupation, and work experience, according to a study on the perceived barriers to infection control for Coronavirus 2019 (COVID-19). Contrarily, male HCWs were four times more likely than female HCWs to follow preventive measures (Birihane et al., 2020).

2.7.5 Consequences of hospital acquired infections

Lukas (2016) reported in their study that hospital-acquired infections are found in 50% of NCUs patients, and this has contributed to a long hospital stay, increased mortality and morbidity, and increased out-of-pocket expenses for patient's families.

According to research on hospital-acquired infections conducted in Europe by the European Center for Disease Prevention and Control (ECDC, 2017), 3.5 million Europeans contract an infection each year while receiving hospital care, and 2.5 million of them pass away or suffer grave impairment as a result. According to co-author Alessandro Cassini from the ECDC, hospital-acquired infections have the greatest impact on the health of the European population and are responsible for a major part of the deaths in Europe each year. The researchers specifically targeted neonatal sepsis (an infection that affects

neonates), septicemia, urinary tract infections, infections acquired during post-operative procedures, and hospital-acquired pneumonia. As a result, researchers developed an additional method for assessing the impact of infections acquired in hospitals (Behnke et al., 2017).

Neill et al., (2016) conducted a study to maintain a decrease in bloodstream infections in neonates at a significant tertiary neonatal intensive care unit. 5.15 and 6.08 episodes per 1,000 neonates days, respectively, represented the baseline reduction in the incidence of bloodstream infection for neonates admitted to the NICU in 2005 and 2006. Following the implementation of the strategy, the frequency of lowered bloodstream infections fell to 2.14 per 1,000 neonate's days in 2008 and to 2.44 per 1,000 neonate days in 2009. For the following four years, the annual incidence stayed low and further declined to 0.20 to 0.45 infections per 1,000 baby days. This shows a 92% decline in the number of bloodstream infections during a period of more than five years.

Neonates who die before becoming 28 years old typically suffer from conditions and illnesses that can be readily prevented or cured with efficient, affordable remedies. The effects of preterm birth, low birth weight, sepsis, pneumonia, and other infectious diseases are a few instances of such situations, as well as birth asphyxia. Due to their immature immune systems, neonates in care units are at a significant risk of contracting infections from healthcare workers (WHO, 2018).

2.7.6 Factors affecting the nursing practice of infection control

In this section, it was found in some research that barriers like lack of time or heavy workload, lack of knowledge, forgetfulness, and lack of supplies and facilities are thought to be cross-cutting barriers to all practices for infection control. such as hand washing, sterility during urinary catheterization, and tracheal suctioning practices are inadequately or improperly done in the presence of such barriers.

2.7.6.1 Hand Washing

A study on "adherence to the five moments for hand hygiene among intensive care workers" was carried out by Santos and Celina in Brazil (2015). According to this survey, the compliance rate for hand hygiene among healthcare professionals was 43.7%, which is considered to be low. Despite having more frequent and direct contact with patients, nurses

reported the worst hand hygiene practices (29%). The handwashing compliance rates were lowest before patient contact and before aseptic operations. These findings show that the unit's handwashing protocols are most at risk. To ensure compliance, hand hygiene procedures must be inspected.

A study was done by Arinze-Onyia et al., (2018) to find out what knowledge HCWs had about SP and how much they used it when treating patients. According to the findings, 68.5% of participants understood the value of washing their hands after coming into contact with bodily fluids or blood, and 45.6% understood the value of doing so before approaching patients. The study also revealed that 73.6% of those polled washed their hands after taking off their gloves, and 33.1% washed their hands before leaving the area. It also revealed that 70% of those surveyed had contact with bodily fluids while caring for patients, and 52.1% had cleaned the area with water, soap, and disinfectants. When interacting with patients who were neonates, 12.2% of people washed their hands.

In a study on hand hygiene compliance with WHO standards, Silva et al., (2017) found that both technique and frequency were lacking (sufficient technique ranged from 0% to 13.3%). 51.8% of neonatal nurses frequently neglect to wash their hands. The phase immediately following touching objects adjacent to neonatal patients was the one that was most disregarded. Only 35% of the unit's planned monthly usage of alcohol gel solution was actually achieved.

Only 18.4% of HCW reported washing their hands before touching a patient, according to a study by Haile, Engeda, and Abdo (2017), while 39.6% of respondents said they cleansed their hands before performing a procedure.

In a study on the frequency of hand washing among neonatal nurses, the compliance rate with hand washing in a neonatal care unit was found to be 15%. Also, after a procedure, neonatal nurses were twice as likely to wash their hands as previously. 12 The WHO's five moments of hand hygiene were also unknown to 52% of HCW (Ngugi et al., 2019).

Conducted a study to assess nurses' and midwives' knowledge of and practices about handwashing for the prevention of infections in NCUs. The findings showed that the mean knowledge score was 78.09% and the mean practice score was 71.27. 36 (72% of responders) of the 50 nurses and midwives who took part in the study had good

understanding of handwashing, while 23 (46% had good practice). However, the findings revealed no connection between nurses' and midwives' awareness and use of hand washing (Mukasine, 2017).

conducted a study on the impact of establishing an infection control program for healthcare providers using evidence-based measurements. The five dimensions were enhanced once the staff-developed program was put into use: Using a pointed box boosted positive swab cultures, which reduced from 56% to 34.6%; using gloves and scrubbing improved from 53.3% to 55%; and the frequency of hand washing went from 47.2% to 79.3%. Knowledge of the Palestinian procedure for infection control increased from 27.5 to 80%. The report advises reconstruction, the creation of an infection control committee, prodding the work group to implement infection control measures via instruction and ongoing education, and supplying the essential medical supplies (Aljeesh & Abu-El-Noor, 2015).

Chhapola & Brar (2015) In neonatal care units, nosocomial infections are a major issue, and hand cleaning has been recommended as an efficient method of limiting the transmission of diseases. Nosocomial infection monitoring was done continuously. pre-intervention and post-intervention phases, respectively, for hand hygiene were seen. Before the intervention, only 46% of healthcare professionals consistently used all available hand hygiene opportunities; following the intervention, this number increased dramatically to 69%. We come to the conclusion that good hand hygiene habits can help reduce nosocomial infections in hospitals, which is crucial in developing countries.

Hand washing is a fundamental infection control method. At Benha University Hospital, improper hand hygiene procedures are to blame for 40% of hospital-acquired diseases. The findings revealed that 7.1% of the nurses under study fell into Class A, meaning that they accurately followed the advised hand hygiene practices. In contrast, 75% of the nurses fell into Class B, meaning that standard practices are typically followed, and 17.9% of the nurses fell into Class C, meaning that training, close observation, and follow-up on recommended standard practices are advised. One could draw the conclusion that local healthcare professionals did not adhere to hand hygiene standards very well. Further training programs and knowledge are required (Abed and Eldesouky, 2020).

2.7.6.2 Lack of material resources

In a qualitative study conducted in Egypt by Lohiniva et al., (2015), focus group discussions revealed that the majority of nurses in both hospitals identified a lack of hand hygiene as being caused by a shortage of products (soap or alcohol) and sinks as the main barrier to adhering to hand hygiene guidelines. Some personnel of the health care department were compelled to move to the next department to wash their hands because the possible problem varied from unit to unit.

In Finland, a quantitative cross-sectional study on "neonatal nurses' knowledge of adherence to and barriers to evidence-based guidelines for the prevention of hospital-acquired infections" was conducted by Jansson et al., (2013). Using a sample size of 101 participants, it was determined that overall self-reported adherence to preventative measures for HAIs was 84.0%. The main barrier to acting on evidence-based advice, according to one's own self-report, was a lack of resources.

Many studies have shown that hand washing is essential for infection management; nevertheless, some healthcare facilities lack the tools and supplies needed for bedside hand rubs and hand washing. Poor adherence to hygienic norms has resulted from this (Shahida, 2016).

Conducted a study on the national Palestinian infection prevention and control protocol's observance at the public pediatric hospitals in the Gaza governorates. Low levels of compliance were found in the use of antiseptics or disinfectants, wearing gloves, and hand washing, according to the observation checklist addressing practices (45.9% and 40.7%, respectively). (49.16%). According to the health facility checklist, there was a shortage of several necessary tools and supplies, including heavy-duty gloves and enclosed waste containers. In conclusion, it is advised that educational and training possibilities be made available and that facilities provide the necessary equipment and supplies. This is because there are not enough practices and knowledge in society (Eljedi & Dalo 2014).

A study on the impact of national culture and setting on healthcare workers' perceptions of infection control in Greek neonatal care units was undertaken by Triantafillou et al., (2020). 37 respondents were questioned by 37 interviewers (20 physicians and 17 neonatal nurses). There are four basic obstacles to preventing HAIs: (1) insufficient funding resulting in understaffing and crowded conditions; (2) lack of knowledge regarding HAIs

prevention; (3) Greek-specific cultural norms, such as hierarchy-driven decisions, a reluctance for public employees to do more than they are paid for, a conviction that personal experience supersedes knowledge gained through evidence, and reactive rather than proactive approaches to societal challenges.

2.7.6.3 Workload

The same Egyptian study discovered that many participants, particularly during the evening and night shifts, claimed that their intense workload made it difficult for them to adhere to hand hygiene regulations. Others alleged that the workload was consistently heavy, which always had an impact on the use of hand sanitizer (Lohiniva et al., 2015).

Conducted a study on neonatal nurse's perceptions of the difficulties in providing infection control measures. All interviewees mentioned a lack of staff, particularly nurses, a lack of time to implement infection control procedures, few opportunities for infection control training, and job stress as the main obstacles. All those who participated in the interview suggested continuing education, the use of multimedia materials, and case study methods (Salem & Youssef, 2017).

Conducted a study on the workload of neonatal nurses and missing nursing care in NCUs. The overall mean of the neonatal nurse workload score was 68.36, indicating a modest overall workload with effort as the highest component. In all, 91.67% of the nurses missed at least 1 out of the 21 fundamental neonatal nursing cares. The neonatal nurse overall workload was dominated by effort (Utomo et al., 2022).

In a study conducted in the neonatal care unit, Tubbs et al., (2019) assess the relationship between neonatal nurses' workload and missed nursing care. 418 neonates were cared for throughout 332 12-hour shifts by 136 nurses, who reported the workload at the shift level and any nursing care that was not provided. When workload factors were modeled individually, seven out of the twelve models showed a significant deteriorating correlation between increased neonate-to-nurse ratio and odds of missing care, while all twelve models showed a significant worsening relationship between increased and odds of missed care. Only four out of the twelve models showed a significant correlation between staffing ratios and the likelihood of missing care when modeling all workload variables together.

2.7.6.4 Endotracheal Suctioning Practices

Endotracheal suctioning, which increases microbial colonization of the lower airway, may be a risk factor for hospital-acquired infection. In recent years, unsafe endotracheal suctioning procedures have been used all around the world due to negative outcomes. In order to ensure that patients are safe and receive high-quality nursing care, nurse practitioners want to take all necessary precautions (Jansson et al., 2013).

An artificial airway, such as an endotracheal tube or a tracheotomy tube, is required for patients under mechanical ventilation management. Due to a compromised cough reflex, poor mucociliary clearance, and possibly increased mucus production, the patients typically retain tracheobronchial secretions. ICU nurses are in charge of removing the secretions because endotracheal suctioning is required to remove residual tracheobronchial secretions. Endotracheal suctioning is necessary, but it should only be used when absolutely necessary because it can induce hypoxemia, dysrhythmias, injury to the tracheal mucosa, and even Ventilator associated pneumonia (Sole et al., 2015).

2.7.6.5 Knowledge of neonatal nurses concerning infection control

Batran et al., (2018) performed a study among nurses in special hospitals in Saudi Arabia to explore their views on their knowledge and commitment to practice SP. They found that 55.1% and 44.4% had a fair to good level of knowledge.

Conducted a study on the lack of knowledge regarding infection control practices among healthcare workers overall knowledge and awareness regarding different infection control practices; the results were excellent (>90% positive responses) among the nursing for infection control Conclusion: Regular educational programs and internal training are still very much needed to improve things (Sodhi et al., 2013).

In a study conducted by Mansour et al., (2019) at El-Minia Hospitals, all nurses were asked about their knowledge of the environmental risk factors for neonatal sepsis. The results showed that more than 75% of them had adequate knowledge of the maternal risk factors and therapeutic management for neonatal sepsis (78.0% and 76.0%), respectively. Also, the majority of nurses had good practices and the minority had poor practices for caring for neonates with sepsis.

According to Shinde and Mohite (2014), there is an essential need to implement strategies to improve staff knowledge, attitudes, and behaviors in teaching hospitals because doing so could significantly increase hand hygiene compliance among neonatal nurses and reduce cross-infection among neonatal patients. In this hospital, strategies for preventing such infections as well as infection control methods are being assessed.

Afolaranmi et al., (2017) highlighted the availability and extent of information among health care providers about infection control and the extent of their application. The study found that 68% of those surveyed had sufficient information about it, while 78.5% had sufficient practice.

Otovwe and Adidatimi (2017) concluded a cross-sectional study in Nigeria about the information available to healthcare providers regarding infection control and their application in dealing with patients that a majority of healthcare staff expressed their knowledge of infection control (97%), and 91.5% said that they apply it when providing care to patients.

Assessed infection control knowledge and compliance. Healthcare professionals were the target audience. The study found that between 38.2% and 37.8% of nurse had some knowledge. In contrast, the compliance rate ranged from 52.9% to 45.6% (Ayed, Eqtait & Fashafsheh, 2015).

Al Hammar et al., (2017) conducted a study in Saudi Arabia to emphasize the infection control of healthcare workers in terms of knowledge. The survey's findings revealed that 90% of the healthcare professionals recognized they should rub their hands with alcohol before and after contact with patients.

2.7.6.6 Other factors

The disposition of patients to isolation facilities and the management of hospital waste are other neglected areas. Health care providers lack of sufficient knowledge about the use of antibiotics also contributes. Other factors, such as the lack of awareness of infection control protocols and individual behaviors, are all barriers to the prevention of hospital-acquired infections. All these factors put together have been reported to contribute to poor nursing practice leading to hospital-acquired infections in ICUs (Shahida, 2016).

Hospital acquired infections (HAIs) are infections that develop at least 48 hours after a neonate's admission and were not present during the neonate's admission or during the incubation period. Infections acquired in hospitals are a serious concern for neonatal illness, healthcare providers, and healthcare systems in general. These illnesses have well-documented repercussions, including increased neonate morbidity and/or mortality, disease risk among healthcare workers, and a significant financial impact on neonates, their families, and healthcare facilities. The sources of these infections are these illnesses (Lukas, 2016).

2.7.7 Summary literature review

This chapter describes the literature in detail based on the study variables. Literature was also described in detail in relation to the variables of this study, with an emphasis on evidence-based findings and the conceptual framework was designed.

Neonatal nurses' practices regarding neonatal infection control are defined as activities and practices that are underpinned by values that guide the way in which neonatal nursing care is provided and those that are aimed at preventing hospital-acquired infections. These skills must be acquired by neonatal nurses if they hope to advance their knowledge and understanding of safety while working in a hospital. In Palestine, the government now places a high priority on infection prevention. They have released guidelines emphasizing strengthening infection control in the healthcare sector, notably in hospitals, especially in light of the global spread of the Corona virus 19 pandemic. Also, a variety of factors affect how competent a particular neonatal nurse is. Along with personal characteristics like education and experience, organizations should also consider climate, support for nursing leaders, and culture. On the basis of the review, the researcher concluded that there is a need to assess neonatal nurse practices related to infection control at NCUs in governmental hospitals in the Gaza Strip.

Chapter Three

Methods and Material

This chapter presents the method of the study used to answer the research questions. In this chapter, different items were explained: study design, place of the study, study population, sample size, sampling process, period of the study, inclusion and exclusion criteria, ethical and administrative considerations, study tools, reliability, validity, a pilot study, data collection, and data management of the study.

3.1 Study design

The study was a descriptive-analytical study that utilized a quantitative cross-sectional approach. The researcher used a quantitative data collection method to numerically illustrate the extent to which assessments were conducted to assess neonatal nurse practices related to infection control assessment in the governmental hospitals at G.S. This design is used because it is suitable, relatively simple, logistically easy, and less expensive. Also, it enables the researcher to meet the study objectives in a short time.

3.2 Study population

The population of this study was consisted of all neonatal nurses working in neonatal care units of the six governmental hospitals during the data collection period, which included 167 full-time nurses with more than six months of experience and different academic levels (Diploma, Baccalaureus, and Master).

3.3 Sample size and sampling method

All neonatal nurses working in neonatal care units of the government hospital’s nurses at G.S., around 167 neonatal nurses, were included in the study "census sample".

Table (3.1): Number of neonatal nurses participating in the study

No	Work Place (Hospital)	Number of neonatal nurses
1.	Tahreer Hospital	17
2.	Al Shifa maternity Hospital	54
3.	Al Rantisi Pediatric "Al Nasser Hospital	37
4.	AL-Emirati Hospital	15
5.	Al Aqsa Hospital	25
6.	European Gaza Hospital	19
Total		167

3.4 Study setting

The setting of the study is the main six neonatal care units in different governorates of the Gaza Strip; these hospitals have neonatal units (Table 3.1)**.**

3.5 Period of the study

In February 2022, the study started after receiving approval from the university and ethical approval from the Helsinki committee. The pilot study was conducted in the second week of November 2022. Data collection began in the second week of January 2023 and was completed in the fourth week of February 2023. Data entry and cleaning took place during March 2023, and data analysis and writing of the final research report were done in the next period until the end of March 2023.

3.6 Eligibility criteria

All neonatal nurses employed in neonatal care in government hospitals of the MOH in the Gaza Strip who consent to participate in the study with at least 6 months of experience in neonatal care units.

3.7 Instruments of the study

A self-administered questionnaire, modified by the researchers from Ezike (2021), and an infection control protocol approved by the Ministry of Health in G.S. (2022) were used to assess the practice of the nurses regarding infection control.

The demographic data of the respondents was covered in the first section of the questionnaire. This data included age, sex, education level, present position, workplace, job experience, in-service course, and educational program. The second section includes questions about the nurses' hand washing; the third section includes questions about the nurses' hand rubbing; and the fourth section includes questions about measuring waste disposal practices. The five sections include questions about measuring the nurses' use of physical barriers; the sixth section includes questions about the nurses' sterilization and disinfection practices; and the final section includes questions about factors influencing adherence to infection control practices (Annex 2).

3.8 Scoring of the questionnaire

Based on literature reviews, the level of practice for neonatal nurses regarding infection control was categorized into three groups (Nguyen et al., 2021). Level of Practice Composite percent of scores

• High ≥ 80%.

• Moderate = 60-79.9%.

• Low < 60%

3.9 Validity of the questionnaires

The constructed questionnaires were sent to five experts (see Annex 3) to validate the questions and their relation to the domains that reflect the study. The comments of the experts were considered, and modification was performed accordingly.

3.10 Half-Split Method

As shown in table (3.2), the correlation between forms was 0. 909 and Unequal Length Spearman-Brown Coefficient was 0. 952 and finally, Guttman Split-Half Coefficient was 0. 952. This result ensures the high reliability of the questionnaire.

Table (3.2): Split and half for each domain of the questionnaire

Reliability Statistics			
Cronbach's Alpha	Part 1	Value	0.985
		N of Items	49
	Part 2	Value	0.960
		N of Items	48
	Total N of Items		97
Correlation Between Forms			0.909
Spearman-Brown Coefficient	Equal Length		0.952
	Unequal Length		0.952
Guttman Split-Half Coefficient			0.952

3.11 Reliability of the instrument

The reliability of an instrument is the degree of consistency with which it measures the attribute it is supposed to be measuring. The test is repeated to the same sample of participation on two occasions and then compares the scores obtained by computing a reliability coefficient. Can be achieved by using Cronbach's Alpha coefficient and Table 3.2 shows the values of Chronbach's Alpha for each questionnaire domain of participants. The table illustrated the reliability of domains; values of Chronbach's Alpha were in the range of 0. 843 and 0. 972 Cronbach's alpha equals 0. 985 for the entire questionnaire in the pilot sample, which indicates the good reliability of the entire questionnaire.

Table (3.3): Reliability of the research for each domain of the questionnaire

No.	Domains	No. of item	Cronbach's Alpha
.1	hand washing practices of the nurses	17	0.962
.2	hand rub practices of the nurses	8	0.950
.3	methods of waste disposal	14	0.966
.4	use of physical barriers	26	0.969
.5	nurses' practice of sterilization/ disinfection	13	0.972
.6	factors influencing adherence to infection control	19	0.843
Total		**97**	**0.985**

3.12 Pilot study

The researcher performed a pilot study in Al Rantisi Pediatric "Al Nasser Hospital, Shifa Maternity Hospital, and European Gaza Hospital after receiving verbal approval to do so from the hospitals general directors. In a pilot study of 20 neonatal nurses, these were included in the study to ensure the reliability of the instruments.

3.13 Data collection

Data were collected by the researcher and two assistant nurses. Each questionnaire had a consent form on the first page that asked the participants to participate in the study voluntarily. The time allocated for each questionnaire was between 15 and 20 minutes. The researcher distributed the questionnaires to the participants at the working time in all shifts and received them after completion of the questionnaires at the designated time.

3.14 Response rate

The total number of target population was 167 subjects. 167 of them positively responded with response rate of 100%.

3.15 Data entry and analysis

After coding the questions, the researcher entered the collected information into Statistical Package for Social Sciences (SPSS) version 25 computer software. A questionnaire sampling was checked, and frequency distributions were conducted to check the data's accuracy, missing values, and cleaning. The questionnaire included both positive and negative items. Items were rated on a three-point frequency scale (including the neutral category). Positive answers have always been for positively worded items. There were no positive responses to negatively worded items. The percentage of positive responses was calculated for each item and domain, and items with negative words were reversed when calculating percentages. Domain-level scores were calculated by summing the items within the domain scale and dividing them by the number of items. Descriptive statistics and frequency tables were used to show sample characteristics and plot differences between various GS hospitals and neonatal nurses' characteristics. Advanced statistical tests such as independent t-test and one-way ANOVA test and Pearson correlation (including Post Hoc-Scheffe test) were used as appropriate to clarify the variances and differences between

means of categorical variables. All analysis and observed differences was considered statistically significant at the level of a P-value equal to or less than 0.05.

3.16 Ethical and administrative considerations and procedures

The researcher maintained all ethical considerations in this study: approval from the Faculty of Health Professions at Al-Quds University (Annex 4), the official letter of approval to conduct the study from the Helsinki Committee (Annex 5), administrative approval from MOH for the data collection process (Annex 6), and all nurses participants were asked to sign consent forms after reading an information sheet.

Chapter Four

Results and Discussion

This chapter illustrates the results of statistical analysis of the data from 167 nurses, including descriptive analysis that presents the socio-demographic characteristics of the study sample and answers to the study questions. In this chapter, the results of this study are presented under the following headings:

Characteristics of the study participants according to socio-demographic information. To assess the existing infection control practices of neonatal nurses among neonatal unitss. To identify the factors affecting the neonatal nursing practice of preventive measures for hospital-acquired infections in neonatal care units in the Gaza Strip. To compare various safety practices among the respondents in the neonatal unit. To assess the neonatal nursing practice regarding prevention of hospital-acquired infections in neonatal care units in the Gaza Strip. To determine the relationship between practice and socio-demographic variables.

4.1 Characteristics of the study participants

The present study was a cross-sectional one that included 167 subjects. The socio-demographic characteristics studied included gender, age, age group, marital status, qualification, current position, hospital, experience in neonatal care units, course or educational program related to infection control, training in infection control practices, receiving training on infection control practices, etc. related to infection control practices at the neonatal care unit.

4.1.1 Distribution of the study population according to the gender

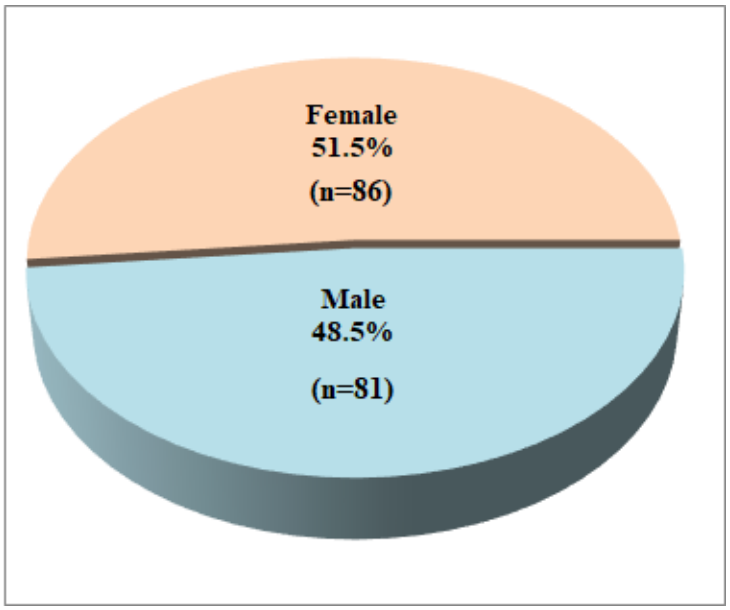


Figure (4.1): Distribution of the study population according to the gender

Figure (4.1) This figure demonstrates that 51.58.% of the study participants were female, as opposed to 48.5% of the male participants. This result is consistent with a study conducted by Almurr (2013) in the West Bank, which found that 53.2% of the population was female and only 46.8% was male. The researcher commented about the This close difference in male and female percentages is due to the nature of the work in neonatal care units. In fact, these units require great effort and feel tender and warm, and this is difficult for two parties, so males by nature endure hard work. Females are therefore tolerant of warmth and sensitivity by nature. Given the historical foundation of female dominance in the nursing profession, their ability to execute the tasks assigned to them jointly and under any circumstances is seen as acceptable (Christensen, 2017).

4.1.2 Distribution of the study population according to the age groups

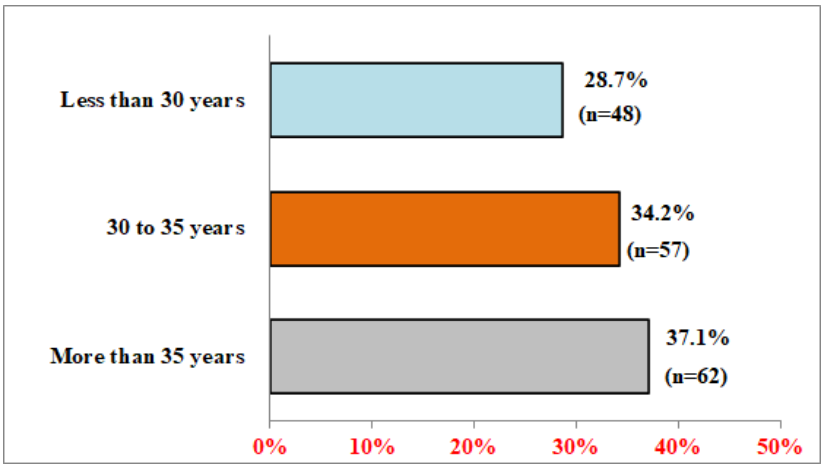


Figure (4.2): Distribution of the study population according to their age groups

Figure (4.2) illustrated that the highest age groups of the participants were age groups More than 35 years which was (37.1%), followed by 34.2% of them being aged between 30 to 35 years. The results showed that the lowest age group of the participants was aged Less than 30 years which was (28.7%). these results are similar to those of the study conducted by Al_Shareef (2020), who found that 41.1% of neonatal nurses were in the age group of more than 35 years. The researcher commented about the significance of neonatal care units that require the strength and vitality of young people, which may improve the ability of neonatal units to deal with the speed of work, decision-making, and carrying workloads.

4.1.3 Distribution of the study population according to the marital status

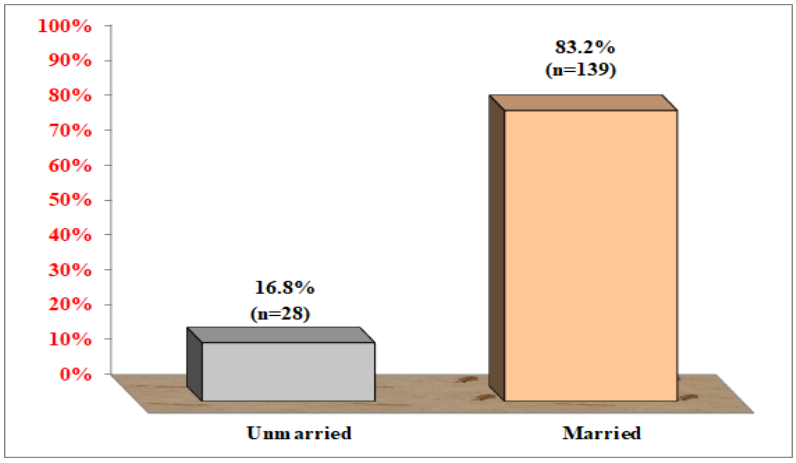


Figure (4.3): Distribution of the study population according to their marital status

Figure (4.3) according to the distribution of the study population by marital status, the largest proportion of participants were married accounting for 83.2%, In contrast, 16.8% of participants reported being unmarried.

4.1.4 Qualification

Table (4.1): Distribution of sample by qualification (n=167).

Socio-demographic characteristics		N	%
Qualification	Diploma	14	8.4
	BSN	132	79.0
	MSN	21	12.6

Table (4.1) show that most of the study participants (79%) had bachelor's degrees; these results are similar to those of the study conducted by Al_Shareef (2020) at neonatal care units in GS, which found that participants (74.2%) had a bachelor's degree. The researcher commented that this is considered a positive for providing appropriate management to practice infection control. In addition, the previously mentioned tends to attract people who hold bachelor's degrees more than other disciplines to work within the neonatal care units since the bachelor's degree holders have awareness in terms of giving medications, making plans for patient care, recording observations, and collaborating with physicians in health care. In addition to the ability to make assessments, analyze results, and advise their families about how to deal with diseases, On the other hand, there were a few participants with a diploma (8.4%) and only 12.6% with a Master of Science in Nursing degree.

4.1.5 Workplace

Table (4.2): Distribution of the study participants according to workplace (n=167)

Work Place (Hospital)	Frequency	Percent (%)
Tahreer Hospital	17	10.2
Al Shifa maternity Hospital	54	32.3
Al Rantisi Pediatric "Al Nasser Hospital	37	22.1
AL-Emirati Hospital	15	9.0
Al Aqsa Hospital	25	15.0
European Gaza Hospital	19	11.4

Table (4.2) 15.0% at Al Aqsa Hospital. Tahreer Hospital (10.2%) had lower percentages. On the other hand, Al-Emirati Hospital employed the least number of study participants (9.0%). This outcome is explained by the researcher, who points out that the Gaza Governorate is one of the most populous governorates (PCBS, 2021), therefore its population is substantial when compared to that of other governorates. This indicates that a high number of healthcare professionals are required in the governorate in order to meet the needs of the population and offer service at all times.

4.1.6 Job Description

Table (4.3): Distribution of sample by current position (n=167)

Job Description	Frequency	Percent (%)
Nurse	29	17.4
Bachelor nurse	132	79.0
Head nurse	6	3.6

As illustrated in Table (4.3) that the majority of the participants held the current position of senior staff nurse, with 79% of them belonging to this category. 17.4% of the participants held the position of nurse. Conversely, only 3.6% of the study participants held the position of head nurse. These results are similar to those of the study conducted by Al Shareef (2020) at neonatal care units in GS, which found that participants (80%) have staff nurses. The researcher comments that senior staff nurses are ambitious and serious; they are the ones on whom the bulk of the work and responsibility falls, in addition to the administrative tasks assigned to them. They are best able to respond to and implement the work protocols assigned to them, so the MOH recruits and distributes large numbers of staff nurses.

4.1.7 Years of work in NCUs

Table (4.4): Distribution of sample by experience years (n=167)

Experience Years	Frequency	Percent (%)
6 month-12month	14	8.4
1-5 years	58	34.7
6-10 years	33	19.8
More than 11 years	62	37.1

Table (4.4) indicates that, in terms of experience in neonatal care units, the participants (34.7%) had 1–5 years of experience, 19.8% had 6–10 years of experience, and 8.4% had 6 months to 1 year of experience. Conversely, the lowest percentage of study participants (8.4%) had 6 months to 1 year of experience in neonatal care units. These results are similar to those of the study conducted by Al Shareef (2020), who found that the participants (38.1%) had 1–5 years of experience. The researcher noted that 34.7% of the study participants had years of experience in the neonatal care unit, which may be the result of nurses rotating between the NICU, SCBU, and Baby Friendly units or to another hospital unit. Due to its emphasis on evidence-based methods rather than more conventional unit experiences, the 1.5–5-year period of participants' experiences may be seen as a significant chance to improve nursing practices. The majority of nurses are young people, making those with less than five years of experience the luckiest. Because neonatal care unit employment demands a considerable deal of effort, strength, and tolerance under pressure.

4.1.8 Distribution of sample by training educational program on infection control

Table (4.5): Distribution of sample by training educational program on infection control

Course or educational program relate infection control	Frequency	Percent (%)
Yes	96	57.5
No	71	42.5
Training on infection control	Frequency	Percent (%)
Yes	126	75.4
No	41	24.6
Receive training on infection control	Frequency	Percent (%)
Last Year	57	45.2
Last two Years	37	29.4
more than two years	32	25.4
Training on infection control during	Frequency	Percent (%)
Workshop	19	15.1
University Study	3	2.4
Traineeship courses	34	27.0
Hospital work	70	55.6

Table (4.5) regarding courses or educational programs related to infection control, the table shows that 57.5% of the participants had taken such a course or program. The results indicate that more than half of the study population had taken a course or educational program related to infection control, with 57.5% of participants reporting completion of such a program. The results indicate that of the study participants had received training in infection control practices, with 75.4% of them having received such training, as shown in Table 4.5. The results indicate that the of the study population received training on infection control. The table shows that the highest percentage of participants received training in the last year (45.2%), followed by 29.4% of participants receiving training in the last two years. On the other hand, only 25.4% of participants received training on infection control more than two years ago, which was the lowest percentage among the study population. The table indicates that the majority of the study population received training on infection control practices. The highest percentage of participants who received such training was in traineeship courses (27%), followed by workshops (15.1%) and university study (2.4%). Conversely, the lowest percentage of study participants who received training on infection control practices came from university studies (2.4%). This

trend is consistent with the results of a previous study by Abul-Enein and El-Mahdi (2011), where neonatal nurses had infection control training. This trend does not correspond with the consequence of previous studies by Al-Almurr (2013) and Al-Shareef (2020), where none of the nurses received training in infection control. The researcher comments that a large number of nurses received infection control training or education. Therefore, the practice of neonatal nurses must be continued and developed to qualify them to work in neonatal units. This may be done by intensifying training courses, lectures, and workshops on scientific days, which helps to increase the ability of nurses to deal well with neonates. They increase their productivity and improve their skills, which leads to an increase in the quality of health services provided, thus reducing the spread of infection.

4.2 Scores of items measuring the hand washing practices of the nurses

Table (4.6a): Scores of items measuring the hand washing practices of the nurses

Hand washing practices of the nurses		Never done	Some times1	Always2	Mean	SD	Mean %	t-test	P-value	Rank
1. Wash hands before starting work at the neonatal department.	N	5	21	141	1.81	0.46	90.72	22.839	0.000*	6
	%	3.0%	12.6%	84.4%						
2. Wash your hands after work and before going home.	N	5	21	141	1.81	0.46	90.72	22.839	0.000*	6
	%	3.0%	12.6%	84.4%						
3. Remove all accessories (bracelets, watches, rings) before washing your hands	N	3	29	135	1.79	0.45	89.52	22.682	0.000*	8
	%	1.8%	17.4%	80.8%						
4. Wash hands after using the computer and telephone inside the department.	N	5	67	95	1.54	0.56	76.95	12.504	0.000*	16
	%	3.0%	40.1%	56.9%						
5. Wash hands with antimicrobial soap and water before contacting a neonate.	N	1	21	145	1.86	0.36	93.11	30.726	0.000*	2
	%	0.6%	12.6%	86.8%						
6. Wash hands with antimicrobial soap and water after contacting a neonate.	N	2	35	130	1.77	0.45	88.32	21.921	0.000*	10
	%	1.20%	21.00%	77.80%						
7. Wash my hands before putting on gloves.	N	8	62	97	1.53	0.59	76.65	11.695	0.000*	17
	%	4.8%	37.1%	58.1%						
8. Wash my hands after taking off the gloves.	N	3	30	134	1.78	0.45	89.22	22.32	0.000*	9
	%	1.8%	18.0%	80.2%						
9. Wash hands according to the five moments of the World Health Organization during my dealings with neonates (before touching the neonate; before performing cleaning or disinfection; after the risk of exposure to fluids from the neonate's body; after touchi	N	5	41	121	1.69	0.52	84.73	17.16	0.000*	11
	%	3.0%	24.6%	72.5%						
10. Washes hands after touching any possible contaminated surface	N	2	24	141	1.83	0.41	91.62	26.521	0.000*	3
	%	1.2%	14.4%	84.4%						

Table (4.6b): Scores of items measuring the hand washing practices of the nurses

Hand washing practices of the nurses		Never done	Some times1	Always2	Mean	SD	Mean %	t-test	P-value	Rank
11. Washes hands-on contact with excretion and secretion of neonates, such as blood and its derivatives, urine, saliva, and sputum, or touching wounds.	N	1	21	145	1.86	0.36	93.12	30.726	0.000*	1
	%	0.6%	12.6%	86.8%						
12. Washes hands with soap and water only	N	3	49	115	1.67	0.51	83.53	17.051	0.000*	12
	%	1.8%	29.3%	68.9%						
13. Washes hands with antimicrobial soap and water when the hands are visibly soiled	N	3	23	141	1.83	0.42	91.32	25.135	0.000*	4
	%	1.8%	13.8%	84.4%						
14. Wash hands surgically when assisting the physician in the placement of a central venous catheter.	N	12	32	123	1.66	0.61	83.23	14.144	0.000*	13
	%	7.2%	19.2%	73.7%						
15. Hands are rinsed with running water, and hands are dried thoroughly using paper towels.	N	5	19	143	1.83	0.45	91.32	23.608	0.000*	4
	%	3.0%	11.4%	85.6%						
16. Wash hands for 40–60 seconds by scrubbing them with a fingertip to the wrist.	N	8	50	109	1.6	0.58	80.24	13.466	0.000*	14
	%	4.8%	29.9%	65.3%						
17. After washing is done, close the water tap using an elbow or paper towels.	N	9	55	103	1.56	0.6	78.14	12.192	0.000*	15
	%	5.4%	32.9%	61.7%						
Total					**1.73**	**0.29**	**86.62**	**32.398**	**0.000***	

*Significant at P≤0.05; P>0 05: Not significant; % mean: percentage mean; SD: standard deviation & t: One sample

Table (4.6) summarized the distribution of the study participants according to their responses about the handwashing practices of the nurses. By using a one-sample t-test, this table shows that the weighted mean for the overall perceptions about handwashing practices of the nurses was 86.62%. presented the practice of infection control. According to the results, the highest paragraph was number 11, "Washes hands-on contact with excretion and secretion of neonates, such as blood and its derivatives, urine, saliva, and sputum, or touching wounds," with a mean score of 1.86 and a weighted mean equal to 93.12%. followed by paragraph number 5 ("Wash hands with antimicrobial soap and water before contacting a neonate. "), with a weighted mean of 93.11%. While the lowest

paragraph (7) " Wash my hands before putting on gloves." with a weighted mean equal to 76. 65%, followed by the paragraph number (4) " Wash hands after using the computer and telephone inside the department." with a weighted mean equal to 76.65%. On the other hand, these results were higher than the result of Ezike et al., (2021) studies in Enugu, Nigeria, which revealed a percentage of handwashing practices among nurses. Many of the subjects—20 (62.5%)—do not wash their hands at all, 2 (6.3%) wash their hands poorly, and 10 (31.3%) wash their hands well before each procedure. Many of the 19 participants (59.4%) also wash their hands well; 11 (34.4%) do not wash their hands at all, and only 1 (3.1%) washes their hands perfectly after each procedure. Only 10 (31.3%) nurses wash their hands before glove use, while 20 (62.5%) do not wash their hands at all before glove use. Only seven (21.9%) people wash their hands before touching each neonate; four (12.5%) do it poorly, and 21 (65.6%) do not wash their hands at all before touching the neonates. This study was similar to those revealed by Labrague et al., (2012) study, which showed 93%.7% in the Philippines. On the other hand, this study was similar to those revealed by the Al Shareef (2020) study, which showed 89.7% in the Gaza Strip. On the other hand, this study was similar to those revealed by the Al-Almurr (2013) study, which showed 90% in the West Bank. On the other hand, this study was inconsistent with those revealed by the Arinze-Onyia (2018) study, whose results showed that 68.5% knew the importance of handwashing after exposure to bodily fluids or blood and 45.6% knew the importance of handwashing before touching patients. The study also showed that 73.6% of those surveyed practiced hand washing after removing gloves, 33.1% did so when leaving the surrounding environment, and 70% were exposed to body fluids when caring for patients, of whom 52.1% washed the exposure area of body fluids with water, soap, and disinfectants. However, 12.2% practiced handwashing before contacting patients. The researcher comments that This demonstrates the nurse's interest and eagerness regarding practicing handwashing to protect themselves from local infection or infection with harmful patient germs and to conserve the healthcare environment from the increasing spread of germs.

4.2.1 Distribution of the study population according to their responses about the hand washing practices of the nurses.

Table (4.7): Distribution of the study population according to their hand washing practices of the nurses.

Variable and level	n (%)	Mean[£]	(SD)	Min	Max
hand washing practices of the nurses		86.62	14.61	0.00	100.00
High	133 (79.6)				
Moderate	27 (16.2)				
Low	7 (4.2)				

n: number of subjects; **SD**: standard deviation; **Min**: minimum; **Max**: maximum; [£]Maximum score of mean = **100 points**; **High**= equal 80% or more; Moderate = 60-79.9%; **Low** = less than 60

Table (4.7) summarized the distribution of the study population according to their responses about the handwashing practices of the nurses. This table showed that 79.6% of the participants have a high hand washing practices of the nurses while 16.2% of them have moderate levels of hand washing practices of the nurses and 4.2% of them had a low level of hand washing practices of the nurses. Finally, the average (SD) of hand washing practices among the nurses' levels was 86.62 (14.61) out of 100 points. This study was inconsistent with those revealed by the Ezike et al., (2021) study, which showed 59.4% in Enugu, Nigeria. As evidenced by the current study, there is a big difference between the study and other studies in terms of hand washing. The researcher comments that this indicates the nurses' awareness and keenness to practice hand washing effectively to protect themselves from infection with the patient's harmful germs and to protect the health care environment from increasing the spread of germs. Also, the continuous follow-up of the infection control team in government hospitals on the methods of hand washing and encouraging them to do so by constantly honoring the best of them.

4.3 Scores of items measuring the hand rub practices of the nurses

Table (4.8): Scores of items measuring the hand rub practices of the nurses

Hand rub practices of the nurses		Never done	Some times	Always	Mean	SD	Mean %	t-test	P-value	Rank
1. Hand rub for at least 20-30 seconds.	N	7	50	110	1.62	0.57	80.89	14.040	0.000*	6
	%	4.2%	29.9%	65.9%						
2. Sure, that the hands are dry and that there is no apparent dirt on them before using the alcohol intended for hand disinfection.	N	7	41	119	1.67	0.55	83.53	15.650	0.000*	3
	%	4.2%	24.6%	71.3%						
3. Use antiseptic hands with designated alcohol only, without washing hands with soap and water if they are not apparently contaminated.	N	11	69	87	1.46	0.62	72.75	9.520	0.000*	8
	%	6.6%	41.3%	52.1%						
4. Rubs palm to palm	N	5	38	124	1.71	0.52	85.63	17.840	0.000*	2
	%	3.0%	22.8%	74.3%						
5. Rubs fingers interlaced	N	1	43	123	1.73	0.46	86.53	20.600	0.000*	1
	%	0.6%	25.7%	73.7%						
6. Rubs palm over dorsum	N	5	53	109	1.62	0.54	81.14	14.780	0.000*	5
	%	3.0%	31.7%	65.3%						
7. Rubs back of fingers	N	1	56	110	1.65	0.49	82.63	17.210	0.000*	4
	%	0.6%	33.5%	65.9%						
8. Rotate-rubbing of the thumbs	N	7	50	110	1.62	0.57	80.84	14.040	0.000*	7
	%	4.2%	29.9%	65.9%						
Total					**1.63**	**0.36**	**81.74**	**23.080**	**0.000***	

*Significant at P≤0.05; P>0 05: Not significant; % mean: percentage mean; SD: standard deviation & t: One sample t-test.

Table (4.8) summarized the distribution of the study participants according to their responses about hand rub practices of the nurses. By using a one-sample t-test this table shows that the weighted mean for the overall perceptions about hand rub practices of the nurses was 81.74%. According to the results, the highest paragraph was the number (5) "Rubs fingers interlaced" with a weighted mean equal 86.53%, followed by the paragraph number (4) " Rubs palm to palm" with a weighted mean equal 85.63%. While the lowest paragraph (3) " Use antiseptic hands with designated alcohol only, without washing hands with soap and water if they are not apparently contaminated." with a weighted mean equal 72.75%, followed by paragraph was the number (8) " Rotate-rubbing of the thumbs" with a weighted mean equal 80.48%. This demonstrates the neonatal nurse's concern and keenness to practice safe hand rubbing to protect themselves from local infection or infection with harmful neonatal germs and to preserve the health care environment from the increased spread of germs. This study was similar to those revealed by Kumari et al., (2022), which showed 73% in India. in addition, this study was inconsistent with those revealed by Kisaka (2021) in Kitale County. The study also found that hand hygiene was commonly done by using an alcohol hand rub (57.7%), as opposed to washing hands with soap and water (42.3%). The researcher explains that alcohol hand rub could be preferred because it is equally effective in decontamination and can be packed in portable bottles that are easy to carry around in pockets, making it easier for healthcare workers to clean their hands at their convenience. Additionally, the COVID-19 pandemic brought forth a season where healthcare workers were extensively sensitized on the use of alcohol hand rub as an alternative to using soap and water for hand hygiene. It is likely that many of them were embracing this practice.

Distribution of the study population according to hand rub practices of the nurses

Table (4.9): Distribution of the study population according to their hand rub practices of the nurses

Variable and level	n (%)	Mean[£]	(SD)	Min	Max
Hand rub practices of the nurses		81.74	17.77	0.00	100.00
High	109 (65.3)				
Moderate	39 (23.4)				
Low	19 (11.4)				

n: number of subjects; **SD**: standard deviation; **Min**: minimum; **Max**: maximum; [£]Maximum score of mean = **100 points**; **High**= equal 80% or more; Moderate = 60-79.9%; **Low** = less than 60

Table (4.9) summarized the distribution of the study population according to their responses about the hand-rubbing practices of the nurses. This table showed that 65.3% of the participants have a high hand rub practices of the nurses while 23.4% of them have moderate levels of hand rub practices of the nurses and 11.4% of them had a low level of hand rub practices of the nurses. Finally, the average (SD) of hand rub practices among the nurses was 81.74 (17.77) out of 100 points.

4.4 Scores of items measuring the methods of waste disposal

Table (4.10a): Scores of items measuring the methods of waste disposal

Methods of waste disposal		Never done	Some times	Always	Mean	SD	Mean %	t-test	P-value	Rank
1. Neonatal nurses adhere to the approved medical waste segregation policies. appropriately (no dangerous medical waste or sharp objects are observed outside the specified containers).	N	4	59	104	1.60	0.54	79.94	14.373	0.000*	8
	%	2.4%	35.3%	62.3%						
2. Places soiled linen in the laundry hamper and closes after	N	8	37	122	1.68	0.56	84.13	15.734	0.000*	5
	%	4.8%	22.2%	73.1%						
3. Put the used paper in the trash with the bags designated for it (black) according to the approved waste sorting policy.	N	5	36	126	1.72	0.51	86.23	18.327	0.000*	4
	%	3.0%	21.6%	75.4%						
4. Put articles contaminated with infective material such as pus, blood, body fluids, feces, or secretions in the yellow waste bag.	N	8	19	140	1.79	0.51	89.52	19.916	0.000*	3
	%	4.8%	11.4%	83.8%						
5. Put waste and disposables, including bandages and handkerchiefs, in the black waste bag.	N	12	43	112	1.60	0.62	79.94	12.451	0.000*	8
	%	7.2%	25.7%	67.1%						
6. Sharp objects (such as needles, blades, and metal tools) are broken and placed in a suitable sharps box (puncture-resistant, encrypted color-coded, and leak-proof).	N	2	23	142	1.84	0.40	91.87	27.046	0.000*	2
	%	1.2%	13.8%	85.0%						

Table (4.10b): Scores of items measuring the methods of waste disposal

7. Sharps are not passed directly from hand to hand	N	7	50	110	1.62	0.57	80.84	14.043	0.000*	7
	%	4.2%	29.9%	65.9%						
8. I do not disconnect the needle from the syringe prior to disposal.	N	16	63	88	1.43	0.66	71.56	8.404	0.000*	14
	%	9.6%	37.7%	52.7%						
9. Put used needles or sharp objects into safety boxes immediately.	N	1	25	141	1.84	0.39	91.92	28.122	0.000*	1
	%	0.6%	15.0%	84.4%						
10. I do not re-cover the needle after use	N	12	48	107	1.57	0.63	78.44	11.752	0.000*	11
	%	7.2%	28.7%	64.1%						
11. Takes personal responsibility for any sharp objects you use and disposes of them in a designated container at the point of use.	N	12	33	122	1.66	0.61	82.93	13.980	0.000*	6
	%	7.2%	19.8%	73.1%						
12. All types of waste containers are available in sufficient numbers and placed in designated and easily accessible locations.	N	15	42	110	1.57	0.65	78.44	11.244	0.000*	11
	%	9.0%	25.1%	65.9%						
13. Sharp containers are not filled by more than two-thirds and are stored in an area away from the visitors and patients' relatives.	N	10	65	92	1.49	0.61	74.55	10.405	0.000*	13
	%	6.0%	38.9%	55.1%						
14. The safety box shall be disposed of after a maximum of 7 days have passed from the date of opening it.	N	8	52	107	1.59	0.58	79.64	13.153	0.000*	10
	%	4.8%	31.1%	64.1%						
Total					**1.64**	**0.34**	**82.14**	**24.399**	0.000*	

*Significant at P≤0.05; P>0 05: Not significant; % mean: percentage mean; SD: standard deviation & t: One sample t-test.

Table (4.10) summarized the distribution of the study participants according to their responses about methods of waste disposal. By using a one-sample t-test, this table shows that the weighted mean for the overall perceptions about methods of waste disposal was 82.14%. According to the results, the highest paragraph was number (9): "Put used needles or sharp objects into safety boxes immediately." with a weighted mean equal to 91.92%, followed by paragraph number (6): "Sharp objects (such as needles, blades, and metal tools) are broken and placed in a suitable sharps box (puncture-resistant, encrypted, color-

coded, and leak-proof)." with a weighted mean equal to 91.87%, the researcher explains that due to providing puncture-resistant containers (sharp boxes), it is possible to get rid of contaminated sharps and distribute the department These findings were relatively similar to the Labrague et al. (2012) study, which revealed that 82.8% of the respondents put used needles in sharps containers. These findings were relatively similar to Al Shareef (2020) study which exposed that 84.1%% of the respondents put used needles in sharp boxes These results were higher than the result by (Laishram et al., 2013; Ahmed, 2014) studies which revealed a percentage 46.5% and 17.42% respectively. While the lowest paragraph (8) " I do not disconnect the needle from the syringe prior to disposal." with a weighted mean equal to 71.56%, followed by paragraph was the number (13) " Sharp containers are not filled by more than two-thirds and are stored in an area away from the visitors and patients' relatives." with a weighted mean equal 74.55%.The researcher attributes this to forgetting to follow infection control due to work pressure because infection control measures are a daily practice that medical care delivery system must repeat and remind all hospital staff of their importance which is simple practices that need reminding. The overall mean score was 1.64 and the weighted percentage was 82.14%. which indicated above a moderate level of practice in infection control.

4.4.1 Distribution of the study population according to their methods of waste disposal

Table (4.11): Distribution of the study population according to their methods of waste disposal

Variable and level	n (%)	Mean£	(SD)	Min	Max
Methods of waste disposal		82.14	17.02	7.14	100.00
High	110 (65.9)				
Moderate	44 (26.3)				
Low	13 (7.8)				

n: number of subjects; **SD**: standard deviation; **Min**: minimum; **Max**: maximum; £Maximum score of mean = **100 points**; **High**= equal 80% or more; Moderate = 60-79.9%; **Low** = less than 60

Table (4.11) illustrated the distribution of the study population according to their responses about methods of waste disposal. This table showed that 65.9% of the participants have a high methods of waste disposal while 26.3% of them have moderate levels of methods of waste disposal and 7.8% of them had a low level of methods of waste disposal. Finally, the average (SD) of methods of waste disposal levels was82.14 (17.02) out of 100 points.

4.5 Scores of items measuring the use of physical barriers

Table (4.12a): Scores of items measuring the use of physical barriers

Use of physical barriers		Never done	Some times	Always	Mean	SD	Mean %	t-test	P-value	Rank
1. Wears gloves when touching or lifting neonates	N	4	22	141	1.82	0.44	91.02	23.919	0.000*	2
	%	2.4%	13.2%	84.4%						
2. Wears gloves whenever there might be contact with sterile sites and non-intact skin or mucous membranes (e.g. bleeding sites, braised sites)	N	4	32	131	1.76	0.48	88.02	20.428	0.000*	6
	%	2.4%	19.2%	78.4%						
3. Use sterile gloves when assisting the doctor in interventions that require a sterile medium, such as insulating a urinary catheter, installing a central vein catheter, installing a chest tube, or taking a sample from the spinal cord.	N	7	27	133	1.75	0.52	87.72	18.740	0.000*	7
	%	4.2%	16.2%	79.6%						
4. Wear sterile gloves when inserting a peripheral venous catheter (cannula) in preterm neonate weighing less than 1500 g.	N	18	64	85	1.40	0.68	70.06	7.656	0.000*	11
	%	10.8%	38.3%	50.9%						
5. Uses sterile gloves during wound dressing and invasive procedures	N	3	45	119	1.69	0.50	84.73	17.969	0.000*	9
	%	1.8%	26.9%	71.3%						
6. Wear non-sterile gloves when inserting a peripheral venous catheter (cannula) in a full-term neonate.	N	17	79	71	1.32	0.65	66.17	6.410	0.000*	16
	%	10.2%	47.3%	42.5%						
7. Wear non-sterile gloves when suctioning upper respiratory aspiration or tube-feeding neonates.	N	18	44	105	1.52	0.68	76.05	9.842	0.000*	10
	%	10.8%	26.3%	62.9%						
8. Change gloves when visibly soiled, torn or punctured	N	6	16	145	1.83	0.46	91.62	23.323	0.000*	1
	%	3.6%	9.6%	86.8%						

Table (4.12b): Scores of items measuring the use of physical barriers

9. Wears gloves when handling contaminated waste items or touching contaminated surfaces	N	5	20	142	1.82	0.46	91.02	23.217	0.000*	2
	%	3.0%	12.0%	85.0%						
10. Used gloves as single-use items	N	6	22	139	1.80	0.49	89.82	21.212	0.000*	5
	%	3.6%	13.2%	83.2%						
11. Keeping fingernails short and/or not using artificial nails	N	7	30	130	1.74	0.53	86.83	18.001	0.000*	8
	%	4.2%	18.0%	77.8%						
12. Only sterile water is used to prepare and dilute medicine vials.	N	34	67	66	1.19	0.75	59.58	3.293	0.001*	20
	%	20.4%	40.1%	39.5%						
13. Make sure of the name of the medicine to be prepared and that it is valid; it is strictly forbidden to use expired medicines.	N	5	23	139	1.80	0.47	90.12	22.120	0.000*	4
	%	3.0%	13.8%	83.2%						
14. The rubber cap on the medicine vial is disinfected with alcohol before it is punctured and left to dry.	N	22	61	84	1.37	0.71	68.56	6.786	0.000*	14
	%	13.2%	36.5%	50.3%						
15. Aprons or gowns are worn when close contact with the neonates' excretion or secretion is anticipated (when there is a risk that clothing may become contaminated).	N	21	62	84	1.38	0.70	68.86	6.969	0.000*	13
	%	12.6%	37.1%	50.3%						
16. Wear gowns as single-use technique.	N	23	56	88	1.39	0.72	69.46	7.000	0.000*	12
	%	13.8%	33.5%	52.7%						
17. Wear leather or plastic gowns (apron or gown) when washing and disinfecting incubators and instruments.	N	18	75	74	1.34	0.66	66.77	6.525	0.000*	15
	%	10.8%	44.9%	44.3%						
18. Wear a non-sterile gown when receiving a baby after birth.	N	19	86	62	1.26	0.65	62.87	5.127	0.000*	18
	%	11.4%	51.5%	37.1%						
19. Wear a non-sterile gown when cleaning neonate patients.	N	24	66	77	1.32	0.71	65.87	5.759	0.000*	17
	%	14.4%	39.5%	46.1%						

Table (4.12c): Scores of items measuring the use of physical barriers

20. Wear a high-efficiency respirator (N95) when entering the isolation room for a neonate patient with airborne diseases.	N	49	83	35	0.92	0.71	45.81	-1.534	0.127	26
	%	29.3%	49.7%	21.0%						
21. Face shields are worn where there is a risk of blood, body fluids, secretions, or excretions splashing into the face.	N	43	81	43	1.00	0.72	50.00	0.000*	0.999	25
	%	25.7%	48.5%	25.7%						
22. Face masks are worn when solutions are mixed to prevent contamination of the sterile field with exhaled air.	N	41	71	55	1.08	0.76	54.19	1.433	0.154	23
	%	24.6%	42.5%	32.9%						
23. Wearing a face mask when aspirating neonates from an ETT.	N	27	77	63	1.22	0.70	60.78	3.958	0.000*	19
	%	16.2%	46.1%	37.7%						
24. Face masks are worn when washing contaminated tools and incubators.	N	30	75	62	1.19	0.72	59.58	3.443	0.001	20
	%	18.0%	44.9%	37.1%						
25. Use a head cap when cleaning tools and machines to be sterilized.	N	42	71	54	1.07	0.76	53.59	1.227	0.222	24
	%	25.1%	42.5%	32.3%						
26. Wear reinforced, impermeable rubber shoes during work.	N	33	71	63	1.18	0.74	58.98	3.142	0.002	22
	%	19.8%	42.5%	37.7%						
Total					**1.43**	**0.32**	**71.46**	**17.251**	0.000*	

*Significant at P≤0.05; P>0 05: Not significant; % mean: percentage mean; SD: standard deviation & t: One sample t-

Table (4.12) summarized the distribution of the study participants according to their responses about Wearing reinforced, impermeable rubber shoes during work. By using a one-sample t-test, this table shows the weighted mean for the overall perceptions about wearing reinforced, impermeable rubber shoes during work was 71.46%. According to the results, the highest paragraph was number (8) "Change gloves when visibly soiled, torn or punctured" with a weighted mean equal to 91.62%, followed by the paragraph number (1) " Wears gloves when touching or lifting neonates" with a weighted mean equal 91.02%. this study was inconsistent with those revealed by the Ezike et al., (2021) study, which showed 23 (71.9%) do not wear gloves when touching or lifting neonates, 5 (15.6%) wear gloves

well while only 3 (9.4%) wear gloves perfectly while touching or lifting neonates. The majority 23 (71.9%) wear gloves well whenever there might be contact with sterile sites and non-intact skin or mucous membranes, 8 (25%) wear gloves poorly, and 1 (3.1%) do not wear gloves at all whenever there might be contact with sterile sites and non-intact skin or mucous membranes. Only 5 (15.6%) of the subjects perfectly wore gloves as single-use items; 20 (62.5%) wore gloves when handling contaminated materials. This study was consistent with those revealed by the Al Shareef (2020) study, which showed that gloves should be used when dealing with neonate patients and that there is a potential for exposure to body fluids. a weighted mean percentage of 88.2%. These results are completely similar to the Haile et al., (2017) study, which showed that 88.7% of those surveyed wore gloves if they anticipated being exposed to blood or bodily fluids. But these consequences are lower than the results of the study by Okechukwu and Modtesh (2012), which revealed 97.8%. The researcher explains This indicates that neonatal nurses are interested in wearing gloves. According to infection control and contact warnings: when the probability of contact with blood and body fluids, secretions, and things that are visibly stained with body fluids is high. Also, when inserting or removing any object from the vein and drawing blood, and when exposed to the patient indirectly, such as when cleaning the tools and removing medical waste.

While the lowest paragraph (20) says, "Wear a high-efficiency respirator (N95) when entering the isolation room for a neonate patient with airborne diseases." with a weighted mean equal to 45. 81%, followed by paragraph was the number (21) " Face shields are worn where there is a risk of blood, body fluids, secretions, or excretions splashing into the face." with a weighted mean equal to 50%. The researcher explains A high-efficiency respirator (N95) and other necessary personal protective equipment should be worn when adequate exposure to bodily fluids is expected. This may be due to insufficient supply. Even when they are provided, it is often due to a lack of capacity, tools, and supplies in the department, or because we live in a low-income country that depends on external support in most aspects of life the outcome of the inability of the MOH to provide it permanently because of the Israeli blockade and the political division between the two parts of the homeland. Which led to the lack of medical equipment to implement infection control. Often, they are provided intermittently by NGOs such as the UNICEF and Medical Aid for Palestinians or because there is a lack of awareness of the importance of adequate follow-up by nurses to implement infection control. The overall mean weighted percentage was

71.46%., which indicated a moderate level of practice of neonatal nurses concerning infection control. Maybe the hospital was not equipped with Personal Protective Equipment (PPE). They forget to follow this infection control and workloads, and might due to that some of the participants may think to wear this PPE make them feel uncomfortable or that this PPE.

4.5.1 Distribution of the study population according to their use of physical barriers

Table (4.13): Distribution of the study population according to their use of physical barriers

Variable and level	n (%)	Mean[£]	(SD)	Min	Max
Use of physical barriers		71.46	16.08	9.62	100.00
High	50 (29.9)				
Moderate	86 (51.5)				
Low	31 (18.6)				

n: number of subjects; **SD**: standard deviation; **Min**: minimum; **Max**: maximum; [£]Maximum score of mean = **100 points**; **High**= equal 80% or more; Moderate = 60-79.9%; **Low** = less than 60

Table (4.13) illustrated the distribution of the study population according to their responses about use of physical barriers. This table showed that 29.9% of the participants have a high use of physical barriers while 51.5% of them have moderate levels of use of physical barriers and 18.6% of them had a low level of use of physical barriers. Finally, the average (SD) of use of physical barriers levels was71.46 (16.08) out of 100 points. This study was consistent with those revealed by the Al Shareef (2020). The researcher explains that this indicates that neonatal nurses scored moderately in the use of physical barriers and decontamination/reusable instrument sterilization. Although most neonatal nurses put on gloves when caring for patients, the glove is used once, one for each patient, and then it is changed. This was noticed by the high percentage of participants who answered that the gloves are changed in the event that they are torn or dirty immediately. There may be moderate degrees of use of physical barriers because they are not always provided with gloves. Similarly, the use of gowns and other necessary personal protective equipment when body fluid exposure is expected was also insufficient. This may be due to their insufficient availability. Even when they are available, they are insufficient due to the increasing number of neonatal patients within the units. This may be due to insufficient supply. Even when they are provided, it is often due to a lack of capacity, tools, and

supplies in the department, or because we live in a low-income country that depends on external support in most aspects of life the outcome of the inability of the MOH to provide it permanently because of the Israeli blockade and the political division between the two parts of the homeland. Which led to the lack of medical equipment to implement infection control. Often, they are provided intermittently by NGOs such as the UNICEF and Medical Aid for Palestinians or because there is a lack of awareness of the importance of adequate follow-up by nurses to implement infection control.

4.6 Scores of items measuring the nurses' practice of sterilization/ disinfection

Table (4.14a): Scores of items measuring the nurses' practice of sterilization/ disinfection

Nurses' practice of sterilization/ disinfection		Never done	Some times	Always	Mean	SD	Mean %	t-test	P-value	Rank
1. Neonatal nurse providers are responsible for cleaning and disinfecting all medical tools and devices daily.	N	4	28	135	1.78	0.47	89.22	21.696	0.000*	2
	%	2.4%	16.8%	80.8%						
2. Washing instruments with clean water takes place in a designated place outside the neonate's hall, and there is a washbasin and basin for washing tools.	N	32	43	92	1.36	0.79	67.96	5.910	0.000*	12
	%	19.2%	25.7%	55.1%						
3. Reusable tools are immersed in (Sidex solution) for 10 hours before cleaning them for reuse.	N	25	64	78	1.32	0.72	65.87	5.692	0.000*	13
	%	15.0%	38.3%	46.7%						
4. Instruments are washed with water as a precondition for sterilization.	N	6	43	118	1.67	0.54	83.53	15.971	0.000*	8
	%	3.6%	25.7%	70.7%						
5. Cleans bathing bowls of neonates with disinfectants after bathing each neonates	N	8	30	129	1.72	0.55	86.23	17.176	0.000*	6
	%	4.8%	18.0%	77.2%						
6. Ensure the hospital floors and surfaces are decontaminated. Decontaminates the neonates' lockers and cupboards using chemical agents once daily.	N	16	54	97	1.49	0.67	74.25	9.406	0.000*	11
	%	9.6%	32.3%	58.1%						

Table (4.14b): Scores of items measuring the nurses' practice of sterilization/ disinfection

7. Disinfects the neonate's incubator after discharge and before admission of another	N	5	28	134	1.77	0.49	88.62	20.502	0.000*	4
	%	3.0%	16.8%	80.2%						
8. The incubator is disinfected every 7 days for the full term and every 5 days for the preterm.	N	7	45	115	1.65	0.56	82.34	14.910	0.000*	9
	%	4.2%	26.9%	68.9%						
9. After using the incubator, all removable parts must be thoroughly washed and cleaned with detergent.	N	7	23	137	1.78	0.51	88.92	19.811	0.000*	3
	%	4.2%	13.8%	82.0%						
10. Rinse and dry thoroughly using disposable paper towels. Then all parts of the incubator must be disinfected with cervanius or alcohol (70%).	N	4	39	124	1.72	0.50	85.93	18.511	0.000*	7
	%	2.4%	23.4%	74.3%						
11. Ventilate the incubator before reusing it.	N	5	31	131	1.75	0.50	87.72	19.635	0.000*	5
	%	3.0%	18.6%	78.4%						
12. Washes disinfect and sterilized the feeding utensils before and after use	N	4	22	141	1.82	0.44	91.02	23.919	0.000*	1
	%	2.4%	13.2%	84.4%						
13. Incubators are disinfected and cleaned daily while the neonate is inside them using a piece of cloth moistened with alcohol.	N	7	54	106	1.59	0.57	79.64	13.393	0.000*	10
	%	4.2%	32.3%	63.5%						
Total					**1.65**	**0.35**	**82.4**	**23.594**	**0.000***	

*Significant at P≤0.05; P>0 05: Not significant; % mean: percentage mean; SD: standard deviation & t: One sample t-test.

Table (4.14) summarized the distribution of study participants according to their evaluations of the nurses' use of sterile and disinfecting techniques. By using a one-sample t-test, this table shows that the weighted mean for the overall perceptions about nurses' practice of sterilization and disinfection was 82.4%. According to the results, the highest paragraph was number 12: "Washes disinfect and sterilize the feeding utensils before and after use," with a weighted mean of 91.02%, followed by paragraph number 1: " Neonatal

nurse providers are responsible for cleaning and disinfecting all medical tools and devices daily," with a weighted mean of 89.22%. While the lowest paragraph (3) says, "Reusable tools are immersed in (Sidex solution) for 10 hours before cleaning them for reuse." with a weighted mean equal to 65.87%, followed by paragraph, was the number (2): "Washing instruments with clean water takes place in a designated place outside the neonate's hall, and there is a washbasin and basin for washing tools." with a weighted mean equal to 67.96%. This study was inconsistent with those revealed by the Ezike et al., (2021) study, which showed 19 (59.4%) of the subjects do not drop used instruments immediately after use in chemicals for 10 minutes, while only 4 (12.5%) scored well on the matter. The majority 21 (65.6%) of the subjects wash instruments well with clean water and detergents as a pre-requisite for sterilization, 7 (21.9%) wash instruments poorly, and 4 (12.5%) do not wash instruments at all. 2.5% of the subjects scored well on not reusing already-used instruments before decontamination and sterilization, while 23.9% scored poorly on the matter, and 4.5% reused already-used instruments before decontamination and sterilization. 13(40.6%) cleaned the bathing bowls of neonates well with disinfectants after bathing each client, 18(56.3%) of the subjects do it poorly. The researcher explains that neonatal nurses prefer cleaning with available disinfectants and reusing them. Since there are no functional sterilization units within the unit, nurses use them less. Distance from the wards to the sterilization unit, time constraints, and an excessive workload can be major factors responsible for poor compliance with the sterilization of reusable instruments.

4.6.1 Distribution of the study population according to their responses about the nurses' practice of sterilization/ disinfection

Table (4.15): Distribution of the study population according to their nurses' practice of sterilization/ disinfection

Variable and level	n (%)	Mean[£]	(SD)	Min	Max
Nurses' practice of sterilization/ disinfection		82.40	17.75	0.00	100.00
High	119 (71.3)				
Moderate	39 (23.4)				
Low	9 (5.4)				

n: number of subjects; **SD**: standard deviation; **Min**: minimum; **Max**: maximum; [£]Maximum score of mean = **100 points**; **High**= equal 80% or more; Moderate = 60-79.9%; **Low** = less than 60

Table (4.15) illustrated the distribution of the study population according to their responses about nurses' practice of sterilization/ disinfection. This table showed that 71.3% of the participants have a high nurses' practice of sterilization/ disinfection while 23.4% of them have moderate levels of nurses' practice of sterilization/ disinfection and 5.4% of them had a low level of nurses' practice of sterilization/ disinfection. Finally, the average (SD) of nurses' practice of sterilization/ disinfection levels was82.4 (17.75) out of 100 points. This study was inconsistent with those revealed by the Ezike et al., (2021). The researcher explains that their moderate responses about neonatal nurses practicing sterilization and disinfection are due to the lack of constant availability of disinfectants, and since there are no functional sterilization units within the neonatal units, it is available around central sterilization units only in major governmental hospitals such as Al-Shifa Hospital, which leads to time restrictions, which negatively affects Working within neonatal units, excessive workload can be a major factor responsible for moderate compliance with sterilization of reusable instruments.

4.7 Scores of items measuring the factors influencing adherence to infection control

Table (4.16a): Scores of items measuring the factors influencing adherence to infection control

Factors influencing adherence to infection control		Strongly disagree	Disagree	Neither agree	Agree	Strongly agree	Mean	SD	%	t-test	P-value	Rank
1. Soap or paper for drying hands is not always available in the department	N	6	23	13	88	37	3.76	1.06	75.20	12.600	0.000*	9
	%	3.6%	13.8%	7.8%	52.7%	22.2%						
2. There are no handwashing basins near the station at the department. ®	N	4	12	22	83	46	3.93	0.95	78.60	19.500	0.000*	5
	%	2.4%	7.2%	13.2%	49.7%	27.5%						
3. Hand sanitizer supplies (designated alcohol) approved by the Ministry of Health are available.	N	1	6	14	90	56	4.16	0.77	83.20	8.800	0.000*	3
	%	0.6%	3.6%	8.4%	53.9%	33.5%						
4. According to international specifications the nurse should not walk more than eight steps to the sink to wash hands.	N	6	17	31	83	30	3.68	1.00	73.60	0.300	0.735	13
	%	3.6%	10.2%	18.6%	49.7%	18.0%						

Table (4.16b): Scores of items measuring the factors influencing adherence to infection control

5. There is a designated area outside the neonatal patient room for cleaning medical equipment.	N	14	51	31	58	13	3.03	1.14	60.60	17.500	0.000*	18
	%	8.4%	30.5%	18.6%	34.7%	7.8%						
6. Firm belief about the effectiveness of hand washing	N	4	5	16	62	80	4.25	0.92	85.00	8.900	0.000*	1
	%	2.4%	3.0%	9.6%	37.1%	47.9%						
7. Frequent hand hygiene leads to dry skin and hand irritation. ®	N	38	74	31	18	6	2.28	1.05	45.60	6.900	0.000*	19
	%	22.8%	44.3%	18.6%	10.8%	3.6%						
8. Hand hygiene supplies are available in the waiting areas.	N	9	21	28	85	24	3.56	1.06	71.20	5.000	0.000*	16
	%	5.4%	12.6%	16.8%	50.9%	14.4%						
9. The lack of warm water for hand washing leads to dry hands.	N	12	23	34	78	20	3.43	1.09	68.60	8.600	0.000*	17
	%	7.2%	13.8%	20.4%	46.7%	12.0%						
10. Neonatal nurse workers use gloves instead of hand washing.	N	5	15	46	66	35	3.66	1.00	73.20	12.800	0.000*	15
	%	3.0%	9.0%	27.5%	39.5%	21.0%						
11. Wear rings while providing nursing care to neonates.	N	2	19	16	69	61	4.01	1.01	80.20	10.000*	0.000*	4
	%	1.2%	11.4%	9.6%	41.3%	36.5%						
12. Workload and the number of neonates to be cared for have an impact.	N	8	13	29	61	56	3.86	1.11	77.20	9.000	0.000*	7
	%	4.8%	7.8%	17.4%	36.5%	33.5%						
13. I think wearing gloves to prevent infection is an alternative to hand sanitizing.	N	6	23	19	76	43	3.76	1.09	75.20	10.700	0.000*	9
	%	3.6%	13.8%	11.4%	45.5%	25.7%						
14. There are no boards available to explain infection control practices.	N	2	14	43	66	42	3.79	0.96	75.80	11.300	0.000*	8
	%	1.2%	8.4%	25.7%	39.5%	25.1%						
15. Lack of guidelines or protocols for explaining practicing infection control.	N	2	11	42	84	28	3.75	0.86	75.00	14.300	0.000*	11
	%	1.2%	6.6%	25.1%	50.3%	16.8%						

Table (4.16c): Scores of items measuring the factors influencing adherence to infection control

16. The head nurse provides nursing staff feedback about hand hygiene.	N	0	13	25	95	34	3.90	0.81	78.00	10.800	0.000*	6
	%	0.0%	7.8%	15.0%	56.9%	20.4%						
17. The supervisor of infection control monitors neonatal nursing staff to give feedback about hand hygiene.	N	1	14	43	86	23	3.69	0.83	73.80	8.000	0.000*	12
	%	0.6%	8.4%	25.7%	51.5%	13.8%						
18. Environment (internal context) not promoting hand hygiene.	N	6	21	34	67	39	3.67	1.08	73.40	21.400	0.000*	14
	%	3.6%	12.6%	20.4%	40.1%	23.4%						
19. The application of encouragement methods by hospital officials	N	0	5	16	81	65	4.23	0.74	84.60	115.100	0.000*	2
	%	0.0%	3.0%	9.6%	48.5%	38.9%						
Total							**74.12**	**7.98**	**1482**	**25.800**	0.000*	

*Significant at P≤0.05; P>0 05: Not significant; % mean: percentage mean; SD: standard deviation & t: One sample t-test.

Table (4.16) summarized the distribution of the study participants according to their responses about the factors influencing adherence to infection control, by using a one-sample t-test this table shows that the weighted mean for the overall perceptions about factors influencing adherence to infection control was 74.12%According to the results, the highest paragraph was the number (6)" Firm belief about the effectiveness of hand washing" with a weighted mean equal to 85.00%, followed by the paragraph number (19) 'The application of encouragement methods by hospital officials" with a weighted mean equal 84.60%. While the lowest paragraph was number (7)" Frequent hand hygiene leads to dry skin and hand irritation." with a weighted mean equal (to 45.60) %, followed by the paragraph number (5)" There is a designated area outside the neonatal patient room for cleaning medical equipment." with a weighted mean equal 60.60%. This study was inconsistent with those revealed by the Eljedi & Dalo (2014) study, it found that hand washing (45.9%), wearing gloves (40.7%), and applying antiseptics or disinfectants (49.16%) had low compliance rates. The researcher in this explains that this result above-average may mean that neonatal nurses are aware of the significant risks they face in adopting infection control practices and standards through hand washing and how to

dispose of waste, sterilization and use of physical barriers. And therefore, nursing's role as a healthcare worker who is often involved in infection control activities would explain why hospital management encourages compliance with infection control standards and protocols and indicated availability of sinks in working units increased the practice of hand hygiene. This might be due to the fact that the presence of conveniently located sinks at the point of care will ease the practice of hand hygiene. in the department. Neonatal nurses will be the only significant feature that will influence practices to fight infection. Nurses should receive up-to-date, evidence-based educational and practical sessions that link theory to clinical practice and elucidate the importance of accurate implementation of proper infection prevention and control practices. Time pressure and workload are recognized barriers to compliance. Therefore, reducing the recommended time for hand antisepsis actions and using tested and well-evaluated hand rub formulations may improve compliance in practice

4.7.1 Distribution of the study population according to their responses about the factors influencing adherence to infection control

Table (4.17): Distribution of the study population according to their factors influencing adherence to infection control

Variable and level	n (%)	Mean[£]	(SD)	Min	Max
Factors influencing adherence to infection control		74.12	7.98	54.74	94.74
High	43 (25.7)				
Moderate	119 (71.3)				
Low	5 (3)				

n: number of subjects; **SD**: standard deviation; **Min**: minimum; **Max**: maximum; [£]Maximum score of mean = **100 points**; **High**= equal 80% or more; Moderate = 60-79.9%; **Low** = less than 60

Table (4.17) illustrated the distribution of the study population according to their responses about factors influencing adherence to infection control. This table showed that 25.7% of the participants have a high factor influencing adherence to infection control while 71.3% of them have moderate levels of factors influencing adherence to infection control and 3% of them had a low level of factors influencing adherence to infection control. Finally, the average (SD) of factors influencing adherence to infection control levels was74.12 (7.98)

out of 100 points. This study was consistent with those revealed by the Russell et al. (2018) study, which showed nurses reported a high level of infection control compliance (mean = 0.89, SD = 0.16), correct knowledge (mean = 0.85, SD = 0.09), and favorable attitudes (mean = 0.81, SD = 0.14).

4.8 Mean difference of studied domains related to demographic data

4.8.1 Mean difference of studied domains related to gender

Table (4.18): Mean difference of studied domains related to gender

Domains	Gender	N	Mean	SD	t	P-value
Hand washing practices of the nurses	Male	81	87.98	14.06	1.174	0.242
	Female	86	85.33	15.07		
Hand rub practices of the nurses	Male	81	82.48	17.27	0.527	0.599
	Female	86	81.03	18.30		
Methods of waste disposal	Male	81	83.55	15.41	1.040	0.300
	Female	86	80.81	18.41		
Use of physical barriers	Male	81	73.81	15.86	1.845	0.067
	Female	86	69.25	16.06		
Nurses' practice of sterilization/ disinfection	Male	81	81.96	17.97	-0.316	0.753
	Female	86	82.83	17.63		
Factors influencing adherence to infection control	Male	81	72.72	8.85	-2.220	0.028*
	Female	86	75.43	6.87		
Total	Male	81	80.42	12.07	0.710	0.479
	Female	86	79.11	11.66		

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **t:** independent t test.

Table (4.18) showed the mean difference in the studied domains regarding gender. The independent t-test demonstrated that there are no statistical differences in the average of the studied domains such as hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization and disinfection, and the domain as a whole (P > 0.05). While the results showed that females had a higher statistical significance in the average level of practice of factors influencing adherence to infection control compared to males (P 0.05), The researcher commented that male and female nurses in the aforementioned hospitals receive the same

training, courses, instructions, and tasks with regard to infection control. Thus, the high level of influencer practice and commitment to infection control among females may be attributed to degree of responsibility, high awareness, and commitment to follow infection control standards.

4.8.2 Mean difference of studied domains related to age group

Table (4.19): Mean difference of studied domains related to age group

Domains	age group	N	Mean	SD	F	P-value
Hand washing practices of the nurses	Less than 30 years	48	88.17	15.03	0.865	0.423
	30 to 35 years	57	87.36	9.13		
	More than 35 years	62	84.72	18.00		
	Total	167	86.62	14.61		
Hand rub practices of the nurses	Less than 30 years	48	86.46	13.29	2.976	0.054
	30 to 35 years	57	81.58	14.34		
	More than 35 years	62	78.23	22.46		
	Total	167	81.74	17.77		
Methods of waste disposal	Less than 30 years	48	84.52	13.63	0.965	0.383
	30 to 35 years	57	82.46	11.89		
	More than 35 years	62	80.01	22.51		
	Total	167	82.14	17.02		
Use of physical barriers	Less than 30 years	48	72.32	13.27	0.669	0.514
	30 to 35 years	57	72.77	11.95		
	More than 35 years	62	69.60	20.76		
	Total	167	71.46	16.08		
Nurses' practice of sterilization/ disinfection	Less than 30 years	48	85.66	12.49	1.606	0.204
	30 to 35 years	57	82.73	13.09		
	More than 35 years	62	79.59	23.74		
	Total	167	82.40	17.75		
Factors influencing adherence to infection control	Less than 30 years	48	75.94	7.00	2.722	0.069
	30 to 35 years	57	72.35	8.46		
	More than 35 years	62	74.33	8.03		
	Total	167	74.12	7.98		
Total	Less than 30 years	48	82.18	8.33	1.920	0.150
	30 to 35 years	57	79.87	8.03		
	More than 35 years	62	77.75	16.13		
	Total	167	79.75	11.84		

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **F:** One-way ANOVA.

Table (4.19) showed that the mean difference of studied domains related to the age group. The one-way ANOVA test showed that there is no statistically significant difference regarding age group in the mean of the studied domain as defined by hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization and disinfection, factors influencing adherence to infection control, and domain as a whole (P>0.05).The researcher commented that all age groups from nurses possessed training courses and capabilities to qualify them to work within the neonatal care units.

4.8.3 Mean difference of studied domains related to marital status

Table (4.20): Mean difference of studied domains related to marital status

Domains	marital status	N	Mean	SD	t	P-value
Hand washing practices of the nurses	Unmarried	28	82.14	23.60	-1.788	0.076
	Married	139	87.52	11.95		
Hand rub practices of the nurses	Unmarried	28	82.59	18.66	0.278	0.782
	Married	139	81.56	17.65		
Methods of waste disposal	Unmarried	28	79.85	21.91	-0.781	0.436
	Married	139	82.61	15.92		
Use of physical barriers	Unmarried	28	72.12	20.75	0.234	0.815
	Married	139	71.33	15.06		
Nurses' practice of sterilization/ disinfection	Unmarried	28	81.18	25.13	-0.399	0.691
	Married	139	82.65	15.97		
Factors influencing adherence to infection control	Unmarried	28	74.14	7.32	0.012	0.991
	Married	139	74.12	8.13		
Total	Unmarried	28	78.67	16.97	-0.527	0.599
	Married	139	79.96	10.58		

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **t:** independent t test.

Table (4.20) showed the mean difference in studied domains among marital status. The independent t-test demonstrated that there are no statistical differences in the average of the studied domain as hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection, factors influencing adherence to infection control and domain as total (P>0.05).

4.8.4 Mean difference of studied domains related to qualification

Table (4.21): Mean difference of studied domains related to qualification

Domains	Qualification	N	Mean	SD	F	P-value
Hand washing practices of the nurses	Diploma	14	85.08	6.05	0.644	0.526
	BSN	132	87.25	14.02		
	MSN	21	83.61	21.12		
	Total	167	86.62	14.61		
Hand rub practices of the nurses	Diploma	14	78.57	15.64	1.404	0.249
	BSN	132	81.16	18.42		
	MSN	21	87.50	13.98		
	Total	167	81.74	17.77		
Methods of waste disposal	Diploma	14	85.46	10.62	0.552	0.577
	BSN	132	81.44	18.12		
	MSN	21	84.35	12.85		
	Total	167	82.14	17.02		
Use of physical barriers	Diploma	14	70.19	13.68	0.047	0.954
	BSN	132	71.58	16.97		
	MSN	21	71.61	11.68		
	Total	167	71.46	16.08		
Nurses' practice of sterilization/ disinfection	Diploma	14	84.62	11.88	1.052	0.352
	BSN	132	82.98	18.85		
	MSN	21	77.29	12.69		
	Total	167	82.40	17.75		
Factors influencing adherence to infection control	Diploma	14	74.74	7.67	0.356	0.701
	BSN	132	74.27	7.83		
	MSN	21	72.78	9.32		
	Total	167	74.12	7.98		
Total	Diploma	14	79.78	6.96	0.004	0.996
	BSN	132	79.78	12.77		
	MSN	21	79.53	7.97		
	Total	167	79.75	11.84		

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **F:** One-way ANOVA.

Table (4.21) showed that the mean difference of studied domains related to the qualification. The one-way ANOVA test showed that there is no statistically significant difference regarding the qualification in the mean of the studied domain as a hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection, factors influencing adherence to infection control and domain as total (P>0.05).

4.8.5 Mean difference of studied domains related to current position

Table (4.22): Mean difference of studied domains related to current position

Domains		N	Mean	SD	F	P-value
Hand washing practices of the nurses	Nurse	29	86.92	8.91	0.016	0.984
	Senior staff nurse	132	86.59	15.80		
	Head nurse	6	85.78	9.74		
	Total	167	86.62	14.61		
Hand rub practices of the nurses	Nurse	29	81.47	16.58	0.453	0.636
	Senior staff nurse	132	81.49	18.22		
	Head nurse	6	88.54	13.93		
	Total	167	81.74	17.77		
Methods of waste disposal	Nurse	29	86.95	10.02	3.663	**0.028***
	Senior staff nurse	132	80.49	18.16		
	Head nurse	6	95.24	2.92		
	Total	167	82.14	17.02		
Use of physical barriers	Nurse	29	74.60	11.81	0.666	0.515
	Senior staff nurse	132	70.82	17.11		
	Head nurse	6	70.51	7.66		
	Total	167	71.46	16.08		
Nurses' practice of sterilization/ disinfection	Nurse	29	87.53	10.76	1.508	0.224
	Senior staff nurse	132	81.41	19.11		
	Head nurse	6	79.49	7.56		
	Total	167	82.40	17.75		
Factors influencing adherence to infection control	Nurse	29	75.75	7.55	0.934	0.395
	Senior staff nurse	132	73.68	8.07		
	Head nurse	6	75.79	8.21		
	Total	167	74.12	7.98		
Total	Nurse	29	82.20	8.08	1.002	0.369
	Senior staff nurse	132	79.08	12.70		
	Head nurse	6	82.56	3.01		
	Total	167	79.75	11.84		

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **F:** One-way ANOVA.

Table (4.22) showed that the mean difference of studied domains related to the current position. The one-way ANOVA test showed that there was no statistically significant difference regarding the current position in the mean of the studied domain as a hand washing practices of the nurses, hand rub practices of the nurses, use of physical barriers, nurses' practice of sterilization/ disinfection, factors influencing adherence to infection control and domain as total (P>0.05). While the results showed that was statistically significant in the average practice of methods of waste disposal, regarding the current position (P<0.05). The researcher attributes the existence of a statistically significant difference in the manner of waste disposal Respondents have all categories due to different tasks, so each category has a job description with duties within it, but they are all where they are. They all feel the same pressure at work, but the responsibilities are different, and they all receive training to become qualified to work in neonatal units. Thus, the job description variant is a factor affecting practice nurses' responses about standard practices in infection control and their impact on service quality.

Post Hoc test of mean difference of the demographic data domain in the current position

Table (4.23): Post Hoc test of mean difference of the demographic data domain in the current position

(I) Current position		Mean Difference (I-J)	Std. Error	Sig.	95% CI	
					Lower	Upper
Nurse	Senior staff nurse	6.45	3.44	0.062	-0.33	13.24
	Head nurse	-8.29	7.52	0.272	-23.13	6.55
Senior staff nurse	Nurse	-6.45	3.44	0.062	-13.24	0.33
	Head nurse	-14.75	7.00	**0.037***	-28.56	-0.93
Head nurse	Nurse	8.29	7.52	0.272	-6.55	23.13
	Senior staff nurse	14.75	7.00	**0.037***	0.93	28.56

*P≤0.05: Significant, P>0.05: Not significant **SE**: the standard error and **CI:** confidence interval;

The mean difference of studied domains related to the current position is pointed out in table (4.23) The Post Hoc (LSD) test showed that the average practices of methods of waste disposal was lower statistically significant among Senior staff nurse compared to Head nurse (P<0.05). In contrast, the results showed that there was no statistically significant difference between the average of other study groups regarding another current position (P>0.05).

4.8.6 Mean difference of studied domains related to hospital

Table (4.24): Mean difference of studied domains related to hospital

Domains	Hospital	N	Mean	SD	F	P-value	Rank
hand washing practices of the nurses	Tahreer Hospital	17	87.20	17.34	0.718	0.611	3
	Al Shifa maternity Hospital	54	87.85	8.28			2
	Al Rantisi Pediatric "Al Nasser Hospital	37	88.95	8.42			1
	AL-Emirati Hospital	15	84.51	13.64			4
	Al Aqsa Hospital	25	84.24	23.05			5
	European Gaza Hospital	19	82.82	21.46			6
	Total	167	86.62	14.61			
hand rub practices of the nurses	Tahreer Hospital	17	84.19	18.77	1.141	0.341	2
	Al Shifa maternity Hospital	54	84.95	11.16			1
	Al Rantisi Pediatric "Al Nasser Hospital	37	78.38	20.28			5
	AL-Emirati Hospital	15	75.83	18.12			6
	Al Aqsa Hospital	25	83.50	17.48			3
	European Gaza Hospital	19	79.28	25.43			4
	Total	167	81.74	17.77			
methods of waste disposal	Tahreer Hospital	17	83.19	21.08	0.594	0.705	2
	Al Shifa maternity Hospital	54	81.94	11.45			4
	Al Rantisi Pediatric "Al Nasser Hospital	37	81.85	18.39			5
	AL-Emirati Hospital	15	87.14	9.04			1
	Al Aqsa Hospital	25	83.00	18.85			3
	European Gaza Hospital	19	77.26	25.09			6
	Total	167	82.14	17.02			
use of physical barriers	Tahreer Hospital	17	68.55	21.70	1.359	0.242	5
	Al Shifa maternity Hospital	54	73.86	11.69			1
	Al Rantisi Pediatric "Al Nasser Hospital	37	72.92	14.78			2
	AL-Emirati Hospital	15	71.15	11.40			4
	Al Aqsa Hospital	25	72.31	16.20			3
	European Gaza Hospital	19	63.56	24.05			6
	Total	167	71.46	16.08			
nurses' practice of sterilization/ disinfection	Tahreer Hospital	17	83.26	24.06	1.394	0.229	3
	Al Shifa maternity Hospital	54	83.97	11.97			2
	Al Rantisi Pediatric "Al Nasser Hospital	37	85.03	14.33			1
	AL-Emirati Hospital	15	80.77	11.90			5
	Al Aqsa Hospital	25	82.77	19.83			4
	European Gaza Hospital	19	72.87	28.34			6
	Total	167	82.40	17.75			
factors influencing adherence to infection control	Tahreer Hospital	17	71.70	7.18	0.611	0.692	6
	Al Shifa maternity Hospital	54	73.68	8.53			4
	Al Rantisi Pediatric "Al Nasser Hospital	37	75.45	7.68			1
	AL-Emirati Hospital	15	73.54	6.64			5
	Al Aqsa Hospital	25	74.40	8.57			3
	European Gaza Hospital	19	75.01	8.14			2
	Total	167	74.12	7.98			
Total	Tahreer Hospital	17	79.68	15.49	0.747	0.590	4
	Al Shifa maternity Hospital	54	81.05	6.93			1
	Al Rantisi Pediatric "Al Nasser Hospital	37	80.43	10.14			2
	AL-Emirati Hospital	15	78.83	6.02			5
	Al Aqsa Hospital	25	80.04	13.83			3
	European Gaza Hospital	19	75.13	20.50			6
	Total	167	79.75	11.84			

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **F:** One-way ANOVA.

Table (4.24) showed that the mean difference of studied domains related to the hospital. The one-way ANOVA test showed that there is no statistically significant difference regarding the hospital in the mean of the studied domain as a hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection, factors influencing adherence to infection control and domain as total (P>0.05). The hand-washing practices of nurses were the highest in Al Rantisi Pediatric "Al Nasser Hospital, with an average rate of 88.95%, and the lowest in European Gaza Hospital, with an average rate of 82.82%. The highest was the AL-Emirati Hospital, with an average rate of 87.14%, and the lowest was the European Gaza Hospital, with an average rate of 77.26%. The use of physical barriers was the highest at Al Shifa maternity Hospital, with an average rate of 73.86%, and the lowest at the European Gaza Hospital, with an average rate of 77.26%, with an average rate of 85.03%, and the least was the European Gaza Hospital, with an average rate of 72.87%. The factors influencing adherence to infection control were the highest at Al Rantisi Pediatric "Al Nasser Hospital, with an average of 75.45%, and the lowest at the AL-Emirati Hospital, with an average of 71.70%. In terms of the total number of all parts, the highest was Al Shifa maternity Hospital, with an average rate of 81.05%, and the lowest was European Gaza Hospital, with an average rate of 75.13%. According to the researcher, these results can be attributed to Al-Shifa Maternity Hospital, the highest in terms of results, as a result of the neonatal nursing staff receiving many courses or educational programs related to the field of infection control, as well as most of the neonatal nurses who hold a high degree qualification and follow up with the infection control team's responsibility in applying and extracting these courses.

4.8.7 Mean difference of studied domains related to experience in neonatal care units

Table (4.25): Mean difference of studied domains related to experience in neonatal care units

Domains	Experience in neonatal care units	N	Mean	SD	F	P-value
Hand washing practices of the nurses	6 month-12month	14	89.08	8.19	0.900	0.443
	1-5 years	58	88.54	8.98		
	6-10 years	33	86.10	17.68		
	More than 11 years	62	84.54	17.81		
	Total	167	86.62	14.61		
Hand rub practices of the nurses	6 month-12month	14	78.57	13.36	1.351	0.260
	1-5 years	58	85.24	13.02		
	6-10 years	33	81.82	21.27		
	More than 11 years	62	79.13	20.12		
	Total	167	81.74	17.77		
Methods of waste disposal	6 month-12month	14	83.93	8.38	0.230	0.876
	1-5 years	58	83.19	13.48		
	6-10 years	33	81.82	18.17		
	More than 11 years	62	80.93	20.67		
	Total	167	82.14	17.02		
Use of physical barriers	6 month-12month	14	69.78	12.43	0.897	0.444
	1-5 years	58	74.20	12.75		
	6-10 years	33	70.80	13.13		
	More than 11 years	62	69.63	20.42		
	Total	167	71.46	16.08		
Nurses' practice of sterilization/ disinfection	6 month-12month	14	83.52	15.49	1.298	0.277
	1-5 years	58	84.62	12.03		
	6-10 years	33	84.62	13.93		
	More than 11 years	62	78.91	23.43		
	Total	167	82.40	17.75		
Factors influencing adherence to infection control	6 month-12month	14	74.21	9.05	0.553	0.647
	1-5 years	58	74.97	7.78		
	6-10 years	33	72.73	8.50		
	More than 11 years	62	74.04	7.73		
	Total	167	74.12	7.98		
Total	6 month-12month	14	79.85	8.30	1.103	0.350
	1-5 years	58	81.79	8.70		
	6-10 years	33	79.65	9.11		
	More than 11 years	62	77.86	15.65		
	Total	167	79.75	11.84		

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **F:** One-way ANOVA.

Table(4.25) showed that the mean difference of studied domains related to the experience in neonatal care units. The one-way ANOVA test showed that there is no statistically significant difference regarding the experience in neonatal care units in the mean of the studied domain as a hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection, factors influencing adherence to infection control and domain as total (P>0.05).

4.8.8 Mean difference of studied domains related to course or educational program related to infection control

Table (4.26): Mean difference of studied domains related to course or educational program related to infection control

Domains	Course or educational program related to infection control	N	Mean	SD	t	P-value
Hand washing practices of the nurses	Yes	96	84.83	17.40	-1.845	0.067
	No	71	89.02	9.19		
Hand rub practices of the nurses	Yes	96	81.58	19.88	-0.136	0.892
	No	71	81.95	14.58		
Methods of waste disposal	Yes	96	81.55	19.63	-0.524	0.601
	No	71	82.95	12.78		
Use of physical barriers	Yes	96	69.13	17.93	-2.207	**0.029***
	No	71	74.62	12.62		
Nurses' practice of sterilization/ disinfection	Yes	96	81.61	20.63	-0.671	0.503
	No	71	83.48	12.93		
Factors influencing adherence to infection control	Yes	96	74.50	7.36	0.708	0.480
	No	71	73.61	8.78		
Total	Yes	96	78.87	13.72	-1.119	0.265
	No	71	80.94	8.63		

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **t:** independent t test.

Table 4.26 shows the mean difference in studied domains regarding courses or educational programs related to infection control. The independent t-test demonstrated that there are no statistical differences in the average of the studied domains, such as hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, the nurses' practice of sterilization and disinfection, factors influencing adherence to infection control, and the domain as a whole, between those who have taken a course or educational program related to infection control and those who haven't (P > 0.05). While the results

showed that there was a lower statistically significant average use of physical barriers among those who had taken courses or participated in educational programs related to infection control compared to those who hadn't (P 0.05), the researcher concluded that there is less statistical significance in the average practice of using physical barriers among those who have taken a course or participated in an educational program related to infection control compared to others. Nurses working in neonatal units need continuous courses related to infection control practices to increase their efficiency, and this will affect the quality of service provided.

4.8.9 Mean difference of studied domains related to received training

Table (4.27): Mean difference of studied domains related to received training in infection control practices

Domains	Received training in infection control practices	N	Mean	SD	t	P-value
Hand washing practices of the nurses	Yes No	126 41	86.46 87.09	15.88 9.84	-0.238	0.812
Hand rub practices of the nurses	Yes No	126 41	82.34 79.88	18.37 15.84	0.770	0.442
Methods of waste disposal	Yes No	126 41	82.57 80.84	18.23 12.72	0.565	0.573
Use of physical barriers	Yes No	126 41	71.28 72.05	16.87 13.52	-0.265	0.791
Nurses' practice of sterilization/ disinfection	Yes No	126 41	82.88 80.96	18.93 13.57	0.600	0.549
Factors influencing adherence to infection control	Yes No	126 41	74.90 71.71	7.65 8.58	2.254	**0.025***
Total	Yes No	126 41	80.07 78.75	12.69 8.81	0.618	0.537

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **t:** independent t test.

Table (4.27) showed the mean difference in studied domains regarding received training in infection control practices. The independent t-test demonstrated that there are no statistical differences in the average of the studied domain as hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection and domain as total among the who have received training in infection control practices compare to haven't (P>0.05). While the results showed that statistically significant in the average practice of factors influencing adherence to infection control among the received training in infection control practices

(P<0.05). The researcher concluded that the practice of factors influencing adherence to infection control practices among trainees who received training on infection control practices indicates the keenness of the MOH to intensify the training of neonatal nurses to limit the spread of infection, especially after the spread of the Corona pandemic. Highly neonate patients are vulnerable to infection because their immune systems are not yet complete, and this reduces the spread of infectious diseases among neonatal nurses and neonates.

4.8.10 Mean difference of studied domains related to receive training

Table (4.28): Mean difference of studied domains related to receive training on infection control

Domains	Receive training on infection control	N	Mean	SD	F	P-value
Hand washing practices of the nurses	Last Year	57	86.84	14.54	0.498	0.609
	Last two Years	37	84.42	19.68		
	more than two years	32	88.14	13.31		
	Total	126	86.46	15.88		
Hand rub practices of the nurses	Last Year	57	85.42	17.77	1.514	0.224
	Last two Years	37	80.41	21.86		
	more than two years	32	79.10	14.25		
	Total	126	82.34	18.37		
Methods of waste disposal	Last Year	57	84.77	16.37	1.625	0.201
	Last two Years	37	78.09	22.75		
	more than two years	32	83.82	14.85		
	Total	126	82.57	18.23		
Use of physical barriers	Last Year	57	72.87	14.32	0.466	0.628
	Last two Years	37	69.80	22.09		
	more than two years	32	70.13	14.22		
	Total	126	71.28	16.87		
Nurses' practice of sterilization/ disinfection	Last Year	57	85.49	12.36	1.461	0.236
	Last two Years	37	78.69	26.42		
	more than two years	32	83.05	18.04		
	Total	126	82.88	18.93		
Factors influencing adherence to infection control	Last Year	57	75.46	7.39	2.361	0.099
	Last two Years	37	72.72	6.52		
	more than two years	32	76.45	8.91		
	Total	126	74.90	7.65		
Total	Last Year	57	81.81	8.93	1.392	0.252
	Last two Years	37	77.35	17.61		
	more than two years	32	80.12	11.43		
	Total	126	80.07	12.69		

*Significant at P≤0.05; P>0 05: Not significant; **n:** number of subjects; **SD**: standard deviation; & **F:** One-way ANOVA.

Table (4.28) showed that the mean difference of studied domains related to the receive training on infection control. The one-way ANOVA test showed that there is no statistically significant difference regarding the duration groups of receive training on infection control in the mean of the studied domain as a hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection, factors influencing adherence to infection control and domain as total (P>0.05).

4.8.11 Mean difference of studied domains related to receiving training

Table (4.29a): Mean difference of studied domains related to receiving training on practices of infection control

Domains	Receiving training on practices of infection control	N	Mean	SD	F	P-value
Hand washing practices of the nurses	Workshop	19	89.47	10.25	0.817	0.487
	University Study	3	93.14	6.12		
	Traineeship courses	34	87.98	10.53		
	Hospital work	70	84.62	19.14		
	Total	126	86.46	15.88		
Hand rub practices of the nurses	Workshop	19	84.54	14.34	1.256	0.293
	University Study	3	79.17	9.55		
	Traineeship courses	34	86.76	17.05		
	Hospital work	70	79.73	19.95		
	Total	126	82.34	18.37		
Methods of waste disposal	Workshop	19	84.02	14.65	0.250	0.862
	University Study	3	90.48	4.12		
	Traineeship courses	34	82.14	14.31		
	Hospital work	70	82.04	21.07		
	Total	126	82.57	18.23		
Use of physical barriers	Workshop	19	75.51	16.15	1.897	0.134
	University Study	3	75.00	3.33		
	Traineeship courses	34	75.11	12.24		
	Hospital work	70	68.10	18.78		
	Total	126	71.28	16.87		

Table (4.29b): Mean difference of studied domains related to receiving training on practices of infection control

Domains	Receiving training on practices of infection control	N	Mean	SD	F	P-value
Nurses' practice of sterilization/ disinfection	Workshop	19	82.59	14.47	0.266	0.850
	University Study	3	88.46	7.69		
	Traineeship courses	34	84.73	11.96		
	Hospital work	70	81.81	22.81		
	Total	126	82.88	18.93		
Factors influencing adherence to infection control	Workshop	19	73.13	7.24	1.777	0.155
	University Study	3	78.60	4.75		
	Traineeship courses	34	73.13	7.17		
	Hospital work	70	76.09	7.92		
	Total	126	74.90	7.65		
Total	Workshop	19	81.54	9.78	0.615	0.606
	University Study	3	84.14	3.18		
	Traineeship courses	34	81.64	7.14		
	Hospital work	70	78.73	15.42		
	Total	126	80.07	12.69		

Table (4.29) showed that the mean difference of studied domains related to the receiving training on practices of infection control. The one-way ANOVA test showed that there is no statistically significant difference regarding the receiving training on practices of infection control in the mean of the studied domain as a hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection, factors influencing adherence to infection control and domain as total ($P>0.05$).

4.9 Correlation between studied domains among the study participants

Table (4.30): Correlation between the studied domains among the study participants

Correlations								
e		**Hand washing practices of the nurses**	**Hand rub practices of the nurses**	**Methods of waste disposal**	**Use of physical barriers**	**Nurses' practice of sterilization/ disinfection**	**Factors influencing adherence to infection control**	**Total**
Hand washing practices of the nurses	r	-	0.471	0.541	0.554	0.633	0.291	0.769
	P-value	-	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*
Hand rub practices of the nurses	r	0.471	-	0.579	0.537	0.446	0.228	0.744
	P-value	0.000*	-	0.000*	0.000*	0.000*	0.003*	0.000*
Methods of waste disposal	r	0.541	0.579	-	0.636	0.689	0.382	0.854
	P-value	0.000*	0.000*	-	0.000*	0.000*	0.000*	0.000*
Use of physical barriers	r	0.554	0.537	0.636	-	0.702	0.173	0.822
	P-value	0.000*	0.000*	0.000*	-	0.000*	0.025*	0.000*
Nurses' practice of sterilization/ disinfection	r	0.633	0.446	0.689	0.702	-	0.371	0.857
	P-value	0.000*	0.000*	0.000*	0.000*	-	0.000*	0.000*
Factors influencing adherence to infection control	r	0.291	0.228	0.382	0.173	0.371	-	0.453
	P-value	0.000*	0.003*	0.000*	0.025*	0.000*	-	0.000*
Total	r	0.769	0.744	0.854	0.822	0.857	0.453	-
	P-value	0.000*	0.000*	0.000*	0.000*	0.000*	0.000*	-

r: Pearson correlation & * indicates a statistically significant difference at P<0.05.

Table (4.30) showed there is a positive correlation between domain as the total with hand washing practices of the nurses, hand rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection, and factors influencing adherence to infection control (P<0.05). Also, their results showed that there is a positive significant correlation between the hand washing practices of the nurses, hand

rub practices of the nurses, methods of waste disposal, use of physical barriers, nurses' practice of sterilization/ disinfection, and factors influencing adherence to infection control ($P<0.05$). The researcher concluded that the results of the study indicate that there is a strong and interdependent relationship between all domains, which indicates that we must give absolute importance to all domains during practice and not overlook any domain and promote another field, but all of them at the same time to reach the ultimate goal of infection prevention.

Chapter Five

Conclusion and Recommendations

In this chapter, the main findings of the study were reviewed, the answers to the research questions were given, and recommendations were made for improving nurses' practices in the assessment of infection control.

5.1 Conclusion

The hospitalized in neonatal care units are exposed to a variety of spread infections, which may result in increased disease transmission and long-term harm. This study aimed to assess neonatal nurses' practices related to infection control at neonatal care units at governmental hospitals in Gaza Strip.

The study's findings showed that nurses had a high level of practice toward hand washing assessments, and show that the nurses had a high level of practice toward hand rubs, a high level of practice toward methods of waste disposal, and a moderate level of practice toward the use of physical barriers. And show that the neonatal nurses had a moderate level of educational programs and a high level of practice based on the training they received.

In addition, it showed there is a positive correlation between the domain as a whole and the hand washing practices of the neonatal nurses, the hand rub practices of the nurses, methods of waste disposal, use of physical barriers, the neonatal nurses' practice of sterilization and disinfection, and factors influencing adherence to infection control ($P< 0.05$).

Also, the results showed that there is a positive and significant correlation between the hand washing practices of the neonatal nurses, the hand rub practices of the nurses, the methods of waste disposal, the use of physical barriers, the neonatal nurses' practices of sterilization and disinfection, and factors influencing adherence to infection control ($P< 0.05$). it can be concluded that nurses in the current study have good practice level regarding infection control.

5.2 Recommendations

The study's recommendations offer several beneficial and rewarding suggestions that might be taken into account to enhance nursing care for neonate who are hospitalized.

For managers & policy makers

1. Availability and accessibility of the written protocol for infection control in the hospital.
2. Availability of all facilities and equipment required for applying the standard of infection control.
3. Continuation of training courses on infection control practice through educational and training programs and regular lectures for neonatal nurses in order to maintain and obtain a better infection control practice.
4. Providing orientation programs for newly employed nurses about infection control
5. A safe and comfortable working environment should be provided to all nurses.

For neonatal nurses

6. Checking for updates and readings on infection control policies; Additionally, ask about any vague information.
7. Must wash hands before and after using the phone or computer.
8. Must use the glove and face mask for suctioning and other procedures.

For researchers

9. Repeat the study with a bigger sample size and random sample choices of participants, including employees from several hospitals, in order to acquire more conclusive results.

References

Abd-Elaziz Mohamed. & Abd-Elmawgood, E. A. (2021). Effect of evidence-based infection prevention and control guidelines on pediatric nurses' practices in neonatal intensive care units.

Abed, N. T., & Eldesouky, R. S. (2020). Infection Control: Hand Hygiene Practices among Nurses in the Neonatal Intensive Care Unit at Benha University Hospital. *The Egyptian Journal of Hospital Medicine*, *80*(1), 619-626.

Abou El Fadl, D. K., Aly, Y. A., Darweesh, E. A. G., Sabri, N. A., & Ahmed, M. A. (2023). Assessment of neonatal intensive care unit nurses' compliance with standard precautions of infection control and identification of enabling factors. *Future Journal of Pharmaceutical Sciences*, *9*(1), 1-13.

Abou El-Enein, N. Y., & El Mahdy, H. M. (2011). Standard precautions: a KAP study among nurses in the dialysis unit in a University Hospital in Alexandria, Egypt. *The Journal of the Egyptian Public Health Association*, *86*(1 and 2), 3-10.Ahmed, A.S. (2014): Needle Stick and Sharp Injuries among Nurses at Zagazig.

Afolaranmi, T. O., Hassan, Z. I., Bello, D. A., Oyebode, T., & Chingle, M. P. (2017). Assessment of knowledge and practice of standard safety precautions among Primary Health Care Workers in Plateau State North Central Nigeria. *International Journal of Biomedical Research*, *8*, 187-93.

Al_Shareef (2020**).** *Knowledge and Practice of Standard Precaution and Sharp Injures among Neonatal Nurses at Governmental Hospitals of Gaza Strip.*

Al-Hammar, L.; Quadri, S.A.; Al-Braheem, N.; Albisher, N.; Al-Suroj, H.; Al-Drees, S.; et al. (2017): *Knowledge of Standard Precautions among Healthcare Professionals in Saudi Arabia: Need for filling the gaps.* IJSR, Vol. 6, Issue. 4, pp.588-591.

Aljeesh, Y., & Abu-El-Noor, N. (2015). An evidenced-based study: measuring the effect of implementing an infection control program on health care providers' compliance to infection control measures. IMPACT: J Res Appl Natural Soc Sci, 1(1), 15-26.

Almeida CC, Pissarra da Silva SM, Flor de Lima Caldas de Oliveira FS, Guimarães Pereira Areias MH (2017). *Nosocomial sepsis: evaluation of the efficacy of preventive measures in a level-III neonatal intensive care unit. J Matern Fetal Neonatal Med.*

Almurr, B., & Altell, M. (2013). Knowledge and practice of standard precaution and sharp injures among nurses in the Northern West Bank Hospitals. *Palestine (Doctoral dissertation, Faculty of Graduate studies, An-Najah National University).*

Arinze-Onyia, S.U.; Ndu, A.C.; Aguwa, E.N.; Modebe, I.; Nwamoh, U.N (2018). *Knowledge and Practice of Standard Precautions by Health-Care Workers in a Tertiary Health Institution in Enugu, Nigeria.* Niger J Clin Pract, Vol. 21, Issue. 2, P. 149-155.

Ayed, A. (2015). Knowledge and practice of nursing staff towards infection control measures in the Palestinian hospitals.

Ayed, A.; Eqtait, M.; Fashafsheh, I. (2015*): Knowledge & Compliance of Nursing Staff towards Standard Precautions in the Palestinian Hospitals*. Advances in Life Science and Technology, Vol.36, pp.21-30.

Batran, A.; Ayed, A.; Salameh, B.; Ayoub, M.; Fasfous, A. (2018): *Are Standard Precautions for Hospital-Acquired Infection among Nurses in Public Sector Satisfactory?* Archives of Medicine and Health Sciences, Vol.6, Issue 2, pp.223-227.

Behnke, M. et al. (2017) „Prävalenz von nosokomialen Infektionen und Antibiotika-Anwendung in deutschen Krankenhäusern", Deutsches Arzteblatt International, 114(50), pp. 851–857. doi: 10.3238/arztebl.2017.0851.

Birihane, B. M., Bayih, W. A., Alemu, A. Y., & Belay, D. M. (2020). Perceived barriers and preventive measures of COVID-19 among healthcare providers in Debretabor, North Central Ethiopia, 2020. *Risk Management and Healthcare Policy*, 2699-2706.

Centers for Disease Control (2020). "When and How to Wash Your Hands". cdc.gov.

Centers for Disease Control and Prevention, (2012): How to Prevent Needlestick and Sharps Injuries. (Breakage of the infection chain).

Centers for Disease Control and Prevention. (2016) Guidance for the Selection and Use of Personal Protective Equipment (PPE) in Healthcare Settings. In Centers for Disease Control and Prevention.

Centers for Disease Control and Prevention. (2022) National Center for Emerging and Zoonotic Infectious Diseases (NCEZID), Division of Healthcare Quality Promotion

(DHQP)https://www.cdc.gov/oralhealth/infectioncontrol/summary-infection-prevention-practices/standard-precautions.html

Chhapola, V., & Brar, R. (2015). Impact of an educational intervention on hand hygiene compliance and infection rate in a developing country neonatal intensive care unit. *International journal of nursing practice*, *21*(5), 486-492.

Christensen, M. (2017): Men in nursing: The early years. Journal of Nursing Education and Practice, (5). 94.

Collins A, Weitkamp J-H, Wynn JL (2018). *Why are preterm newborns at increased risk of infection? Arch Dis Child Fetal Neonatal Ed 2018.* Comprehensive Specialized Hospital, Northwest Ethiopia. J Environ Public Health.

De Neef M, Bakker L, Dijkstra S, Raymakers- Janssen P, Vileito A, Ista E (2019). *Effectiveness of a Ventilator Care Bundle to Prevent Ventilator- Associated Pneumonia at the PICU: A Systematic Review and Meta-Analysis.*

Deshmukh, Manoj, and Mahadeo Shinde. "Impact of structured education on knowledge and practice regarding venous access device care among nurses." *Int J Sci Res* 3.5 (2014): 895e901.

Eljedi, A., & Dalo, S. (2014). Compliance with the national palestinian infection prevention and control protocol at governmental paediatric hospitals in gaza governorates. Sultan Qaboos University Medical Journal, 14(3), e375.

Ezike, O. C., Nwaneri, A. C., Odikpo, L. C., Onyia, E. N., Makata, N. E., Irodi, C. C., & Ndubuisi, I. (2021*). Infection control practices among nurses working in neonatal intensive care units (NICU) of two selected tertiary hospitals in Enugu, Nigeria.* International Journal of Africa Nursing Sciences, 15, 100344.

Food and Drug Administration (FDA). United States Safety and Effectiveness of Health Care Antiseptics; Topical Antimicrobial Drug Products for Over-the-Counter Human Use. Published Dec 20, 2017. Effective Dec 18, 2018.

Gamil Alrubaiee1 (2017). *Knowledge and practices of nurses regarding nosocomial infection control measures in private hospitals in Sana'a City, Yemen.*

GNN. (2022). Ministry of Health Hospitals General Administration GNN-NICU statistics JULY 2022.

Gulilat, K. (2014). Assessment of Knowledge, Attitude And Practice of Health Care Workers On Infection Prevention in Health Institution Bahir Dar City Administration. Science Journal of Public Health, 2(5), 384. https://doi.org/10.11648/j.sjph.20140205.13

Haile, T. G., Engeda, E. H., & Abdo, A. A. (2017). Compliance with standard precautions and associated factors among healthcare workers in Gondar University Comprehensive Specialized Hospital, Northwest Ethiopia. *Journal of environmental and public health*, *2017*.

Haque M., Sartelli M., McKimm J., Bakar M.A. *Health care-associated infections—an overview. Infect. Drug Resist. 2018.*

Hassan, H., Malk, R., Abdelhamed, A., & Genedy, A. (2020). Infection control knowledge and practices: Program management in labor units according to standard infection control precautions in Northern Upper Egypt. *American Journal of Nursing Research*, *8*(4), 412-425.

Hockenberry, M. J., Wilson, D., & Rodgers, C. C (2016). *Wong's Essentials of Pediatric Nursing-EBook: Elsevier Health Sciences.*

Holzmann-Pazgal G (2019). *Central Line-Associated Blood-Stream Infection (CLABSI). In Healthcare- Associated Infections in Children, (pp. 95-106). Springer, Cham.* immediate response.

Ismail, M. E., & Mostafa, A. I. (2016). Knowledge and practice OF standard precautions among neonatal intensive care unit healthcare workers of misurata teaching hospital, libya.

Jansson, M., Ala-Kokko, T., Ylipalosaari, P., Syrjälä, H., & Kyngäs, H. (2013). Critical care nurses' knowledge of, adherence to and barriers towards evidence-based guidelines for the prevention of ventilator-associated pneumonia–A survey study. Intensive and Critical Care Nursing, 29(4), 216-227.

Jong E, Strunk T, Burgner D (2017). *Lavoie PM, Currie A. The phenotype and function of preterm infant monocytes: implications for susceptibility to infection. J LeukocBiol 2017*.

K. Sands, M.J. Carvalho, E. Portal, K. Thomson, C. Dyer (2021). *Characterisation of antimicrobial-resistant Gram-negative bacteria that cause neonatal sepsis in seven low- and middle-income countries Nat Microbiol, 6 (4), pp. 512-523.*

Karaaslan, A., Kepenekli Kadayifci, E., Atıcı, S., Sili, U., Soysal, A., Çulha, G., & Bakır, M. (2014). Compliance of healthcare workers with hand hygiene practices in neonatal and pediatric intensive care units: overt observation. *Interdisciplinary perspectives on infectious diseases*, *2014*.

Kisaka, Y. N. (2021). *Factors affecting compliance to infection prevention and control measures among frontline health workers: a case study of the Kitale County Referral Hospital* (Doctoral dissertation, Strathmore University).

Kumari, N. K. N., & Pinto, K. M. P. K. M. (2022). *Nosocomial infection control practices among nursing staff in the neonatal intensive care unit in multispecialty teaching hospital. Worldwide journals*, 11(12).

Labrague, L., Rosales, R., Tizon, M. (2012). *Knowledge of and Compliance with Standard Precautions among Student Nurses.* International Journal of Advanced Nursing Studies.

Laishram, J., Keisam, A., Phesao, E., Tarao, M. S., Laloo, V. J., & Devi, H. S. (2013). Prevalence of needle stick injuries among nurses in a tertiary care hospital and their immediate response. *International Journal of Medicine and Public Health*, *3*(4).

Lohiniva, A. L., Bassim, H., Hafez, S., Kamel, E., Ahmed, E., Saeed, T., & Talaat, M. (2015). Determinants of hand hygiene compliance in Egypt: building blocks for a communication strategy. EMHJ-Eastern Mediterranean Health Journal, 21(9), 665-670.

Lukas (2016): *Establishment of a hospital-acquired infection surveillance system in a teaching hospital in Rwanda", International Journal of Infection Control.*

Mansour Ibrahim, R. A., Gadallah, M. A. E. A., Ali, A. S., & Abolwafa, N. F. (2019). Assessment of Nurses' Knowledge and Practices Related Neonatal Sepsis in Neonatal Intensive Care Units at El-Minia Hospitals. *Minia Scientific Nursing Journal*, *6*(1), 71-77.

Medhat, H., & Khashana, A (2017). *Incidence of Neonatal Infection in South Sinai, Egypt International Journal of Infection,*

Mehta, Y. (2014) Guidelines for prevention of hospital acquired infections", Indian Journal of Critical Care Medicine, 18(3), p. 149. doi: 10.4103/0972-5229.128705.

Ministry of Health (2022). *Annual Health Report, Gaza Strip. Palestine.*

Ministry of Health (2022). *Infection control guide for Gaza Strip.*

Moore, D. S., Notz, W. I, & Flinger, M. A. (2013). The basic practice of statistics (6th ed.). New York, NY: W. H. Freeman and Company.

Mukasine, A. M. (2017). Handwashing knowledge and practice among nurses and Midwives for Infection prevention in neonatology at a selected district hospital (Doctoral dissertation, University of Rwanda).

Murphy GA, Gathara D, Mwaniki A, Nabea G, Mwachiro J, Abuya N, et al. *Nursing knowledge of essential maternal and newborn care in a high-mortality urban African setting: A cross-sectional study.*

Nair S SHanumantappa, R, Hiremath S G, Siraj M A, and Raghunath P (2014): *Knowledge, Attitude, and Practice of Hand Hygiene among Medical and Nursing Students at a Tertiary Health Care Centre in Raichur, India ISRN Preventive Medicine Volume 2014.*

Nates JL, Nunnally M, Kleinpell R, Blosser S, Goldner J, Birriel B, Fowler CS, Byrum D, Miles WS, Bailey H, Sprung CL (2016). *ICU admission, discharge, and triage guidelines: a framework to enhance clinical operations, development of institutional policies, and further research. Critical care medicine.*

Neill, S., Haithcock, S., Smith, P. B., Goldberg, R., Bidegain, M., Tanaka, D., ... & Ericson, J. E. (2016). Sustained reduction in bloodstream infections in infants at a large tertiary care neonatal intensive care unit. *Advances in neonatal care: official journal of the National Association of Neonatal Nurses*, *16*(1), 52.

Ngugi, S. K., Murila, F. V, & Musoke, R. N. (2019). Hand hygiene practices among healthcare workers in a newborn unit of a tertiary referral hospital in Kenya.

Nguyen, H. B., Nguyen, T. H. M., Tran, T. T. T., Vo, T. H. N., Tran, V. H., Do, T. N. P., … Ly, L. K. (2021). Knowledge, Attitudes, Practices, and Related Factors Towards COVID-19 Prevention Among Patients at University Medical Center Ho Chi Minh City, Vietnam. Risk Management and Healthcare Policy, 14, 2119. https://doi.org/10.2147/RMHP.S305959

Nist, M. D., Pickler, R. H., & Harrison, T. M. (2022). Gloving and touch practices of neonatal nurses. *The Journal of Perinatal & Neonatal Nursing*, *36*(1), 86-92.

Ogoina, D.; Pondei, K.; Adetunji, B.; Chima, G.; Isichei, C.; and Gidado, S. (2015): Knowledge, attitude and practice of standard precautions of infection control by hospital workers in two tertiary hospitals in Nigeria. Journal of Infection Prevention.

Okechukwu, E.F.; Modteshi, C. (2012): Knowledge and practice of standard precautions in public health facilities in Abuja, Nigeria. Int J Infect Control.

Okello, T. R., Kansime, K., Odora, J., Apio, J. A., & Pecorella, I. (2017). Barriers and factors affecting personal protective equipment usage in St. Mary's Hospital Lacor in Northern Uganda. East and Central African Journal of Surgery, 22(1), 59.

Olmsted, N.R. (2016): *Basic Concepts of Infection Control. IFIC, 3rd edition.*

Otovwe, A.; Adidatimi, P.O. (2017): *Knowledge, Attitude and Practice of standard precaution among Health Care Workers in Federal Medical Centre Yenagoa, Nigeria.*

Palestinian Central Bureau of Statistics - PCBS (2021): Palestinian annual book of statistics, Ramallah. Palestine. (https://www.pcbs.gov.ps).

Ramasethu (2017): *Prevention and treatment of neonatal nosocomial infections. Matern Heal NeonatolPerinatol.*

Russell, D., Dowding, D. W., McDonald, M. V., Adams, V., Rosati, R. J., Larson, E. L., & Shang, J. (2018). *Factors for compliance with infection control practices in home healthcare: findings from a survey of nurses' knowledge and attitudes toward infection control.*

Salem MR, Youssef MRL (2017): *Health care providers' perspectives for providing quality infection control measures at the neonatal intensive care unit, Cairo University Hospital. Am J Infect Control.*

Salem, M. R., & Youssef, M. R. L. (2017). Health care providers' perspectives for providing quality infection control measures at the neonatal intensive care unit, Cairo University Hospital. *American Journal of Infection Control*, *45*(9), e99-e102

Santos, E. and Celina, L. (2015) „Adherence to the fi ve moments for hand hygiene among intensive care professionals“, 36(4).

Shahida, S. M. (2016) „Hospital Acquired Infections in Low and Middle Income Countries: Root Cause Analysis and the Development of Infection Control Practices in Bangladesh“, Open journal of obstetrics and gynecology, (January), pp. 28–39.

Shahram A.O., Mohammed A.R., Kamyar G and Farahanz F (2014): *An epidemiological study of nosocomial infections in Tabriz Children's hospital based on national nosocomial infection surveillance system.*

Shauq, A. H., Obaid, K. B., Zaid, W., Summer, K., Ulaa, N., Sabeh, O., ... & Amna, M. (2014). NursesKnowledge about Universal Precautions in Neonatal Intensive Care Unit at Pediatric Teaching Hospitals in Baghdad City: Descriptive Study. *kerbala journal of pharmaceutical sciences*, (8).

Shinde MB &Mohite VR. (2014): *A study to assess knowledge, attitude and practices of five moments of hand hygiene among nursing staff and students at a tertiary care hospital at Karad. International Journal of Science and Research (IJSR).*

Silva, D. S., Dourado, A. A. G., Cerqueira, C. R. E., Romero, F. H., Amaral, N. A., Pearce, P. F., ... & Calcagno, J. I. (2017). Hand hygiene adherence according to World Health Organization Recommendations in a Neonatal Intensive Care Unit. *Revista Brasileira de Saúde Materno Infantil*, *17*, 551-559.

Sodhi, K., Shrivastava, A., Arya, M., & Kumar, M. (2013). Knowledge of infection control practices among intensive care nurses in a tertiary care hospital. *Journal of infection and public health*, *6*(4), 269-275.

Sole, M. L., Bennett, M., & Ashworth, S. (2015). *Clinical indicators for endotracheal suctioning in adult patients receiving mechanical ventilation. American Journal of Critical Care, 24(4), 318-324.*

Steinbach, G. Stoll BJ, Hansen NI, Bell EF (2013): *Neonatal outcomes of extremely preterm infants from the NICHD Neonatal Research Network. Pediatrics.*

Triantafillou, V., Kopsidas, I., Kyriakousi, A., Zaoutis, T. E., & Szymczak, J. E. (2020). Influence of national culture and context on healthcare workers' perceptions of

infection prevention in Greek neonatal intensive care units. *Journal of Hospital Infection*, *104*(4), 552-559.

Tubbs-Cooley, H. L., Mara, C. A., Carle, A. C., Mark, B. A., & Pickler, R. H. (2019). Association of nurse workload with missed nursing care in the neonatal intensive care unit. *JAMA pediatrics*, *173*(1), 44-51.

UNICEF, World Health Organization, World Bank Group, United Nations (2015): *Levels and Trends in Child Mortality Report 2015.*

United States agency for international development (USAID) (2010). *Neonatal Care. Protocol for hospital physicians.* University Hospitals, Sharkia Governorate, Egypt. Middle East Journal of Applied.

Utomo, M. T., Sampurna, M. T. A., Melisa, M., Permana, P. B. D., Albright, I. A., Etika, R., ... & Irzaldy, A. (2022). Nurse workload, missed nursing care, and the contributing factors in the Neonatal Intensive Care Unit in a limited resource setting: A case from Indonesia. *F1000Research*, *11*(468), 468

World Health Organization (2018): *Newborn: reducing mortality; Key Facts. WHO Fact Sheets 2019.*

World Health Organization (2020): Children: improving survival and well-being. WHO Fact Sheet 8 September 2020. World Health Organization (2021).

Annexes

Annex (1) Palestine map

Annex (2) Self-administered questionnaire English

Consent Form

Questionnaire (English version)

Dear participant,

I am the researcher, Mohammad Abdallah Mohammad Alhelou, a Master of Pediatric Nursing from the College of Graduate Studies at Al-Quds University Abu Dis. I am conducting this research as a requirement for obtaining a master's degree. I am very pleased to participate in a research study titled " **Neonatal Nurses' Practices Related to Infection Control at Neonatal Care Units at Governmental Hospitals in the Gaza Strip**." You have the right to know what you will be asked to do so that you can decide whether to participate or not in the study. Your participation is voluntary. If you do not wish to continue participating, you may stop at any time. This study is funded by the researcher himself. Therefore, we hope that you will answer objectively the questions in the questionnaire by marking the answer that you deem appropriate in the space designated for it because your opinion is of great importance to this study. This study will take approximately 15 minutes. This study will be used for scientific research purposes only. I appreciate your participation in the research project.

Researcher: Mohammed Abdallah Mohammed Alhelou Signature

Melhelou9@gmail.com

Socio-Demographic Data

Gender	☐Male	☐ Female		
Age				
Marital status	☐ Single	☐Married	☐ Other	
Qualification	☐ Diploma	☐BSN	☐ MSN	☐ Ph.D
Current position	☐Practical nurse	☐ Bachelor nurse		☐Head nurse
Hospital	☐Tahreer Hosp.	☐Al Shifa maternity Hosp.	☐Al Rantisi Pediatric "Al Nasser Hosp.	
	☐AL-Emirati Hosp.	☐Al Aqsa Hosp.	☐European Gaza Hosp.	
Experience in neonatal care units	☐6 month-12month	☐1-5 years	☐6-10 years	☐More than 11 years

A	**Have you had any course or educational program related to infection control**? ☐Yes ☐No

B	**Have you received training in infection control practices**?☐Yes ☐No

C	**If "yes" to question (B), when did you receive training on infection control?**		
	☐ Last Year	☐Last two Years	☐more than two years

D	**Place of receiving training on practices of infection control**			
	☐ Workshop	☐University Study	☐ Traineeship courses	☐ Hospital work

1.Hand washing practices of the nurses.

NO	Parameter	Response		
		Never done	Some times	Always
1.	Wash hands before starting work at the neonatal department.			
2.	Wash your hands after work and before going home.			
3.	Remove all accessories (bracelets, watches, rings) before washing your hands			
4.	Wash hands after using the computer and telephone inside the department.			
5.	Wash hands with antimicrobial soap and water before contacting a neonate.			
6.	Wash hands with antimicrobial soap and water after contacting a neonate.			
7.	Wash my hands before putting on gloves.			
8.	Wash my hands after taking off the gloves.			
9.	Wash hands according to the five moments of the World Health Organization during my dealings with neonates (before touching the neonate; before performing cleaning or disinfection; after the risk of exposure to fluids from the neonate's body; after touching the neonate; after touching the neonate's surroundings).			
10.	Washes hands after touching any possible contaminated surface			
11.	Washes hands-on contact with excretion and secretion of neonates, such as blood and its derivatives, urine, saliva, and sputum, or touching wounds.			
12.	Washes hands with soap and water only			
13.	Washes hands with antimicrobial soap and water when the hands are visibly soiled			
14.	Wash hands surgically when assisting the physician in the placement of a central venous catheter.			
15.	Hands are rinsed with running water, and hands are dried thoroughly using paper towels.			
16.	Wash hands for 40–60 seconds by scrubbing them with a fingertip to the wrist.			
17.	After washing is done, close the water tap using an elbow or paper towels.			

2.Hand rub practices of the nurses.

Direction: please consider the following behavior as they relate to your practice. You should consider your reaction to each behavior and put (√) in the column you have chosen

NO	**Parameter**	**Response**		
		Never done	**Some times**	**Always**
1.	Hand rub for at least 20-30 seconds.			
2.	Sure, that the hands are dry and that there is no apparent dirt on them before using the alcohol intended for hand disinfection.			
3	Use antiseptic hands with designated alcohol only, without washing hands with soap and water if they are not apparently contaminated.			
4.	Rubs palm to palm			
5.	Rubs fingers interlaced			
6.	Rubs palm over dorsum			
7.	Rubs back of fingers			
8.	Rotate-rubbing of the thumbs			

3.Methods of Waste Disposal

Direction: please consider the following behavior as they relate to your practice. You should consider your reaction to each behavior and put (√) in the column you have chosen

NO	Parameter	Response		
		Never done	**Some times**	**Always**
1.	Neonatal nurses adhere to the approved medical waste segregation policies. appropriately (no dangerous medical waste or sharp objects are observed outside the specified containers).			
2.	Places soiled linen in the laundry hamper and closes after			
3.	Put the used paper in the trash with the bags designated for it (black) according to the approved waste sorting policy.			
4	Put articles contaminated with infective material such as pus, blood, body fluids, feces, or secretions in the yellow waste bag.			
5.	Put waste and disposables, including bandages and handkerchiefs, in the black waste bag.			
6.	Sharp objects (such as needles, blades, and metal tools) are broken and placed in a suitable sharps box (puncture-resistant, encrypted color-coded, and leak-proof).			
7.	Sharps are not passed directly from hand to hand			
8.	I do not disconnect the needle from the syringe prior to disposal.			
9.	Put used needles or sharp objects into safety boxes immediately.			
10.	I do not re-cover the needle after use			
11.	Takes personal responsibility for any sharp objects you use and disposes of them in a designated container at the point of use.			
12.	All types of waste containers are available in sufficient numbers and placed in designated and easily accessible locations.			
13.	Sharp containers are not filled by more than two-thirds and are stored in an area away from the visitors and patients' relatives.			
14.	The safety box shall be disposed of after a maximum of 7 days have passed from the date of opening it.			

4.Use of Physical Barriers.

Direction: please consider the following behavior as they relate to your practice. You should consider your reaction to each behavior and put (√) in the column you have chosen

NO	Parameter	Response		
		Never done	Some times	Always
1.	Wears gloves when touching or lifting neonates			
2.	Wears gloves whenever there might be contact with sterile sites and non-intact skin or mucous membranes (e.g. bleeding sites, braised sites)			
3.	Use sterile gloves when assisting the doctor in interventions that require a sterile medium, such as insulating a urinary catheter, installing a central vein catheter, installing a chest tube, or taking a sample from the spinal cord.			
4.	Wear sterile gloves when inserting a peripheral venous catheter (cannula) in preterm neonate weighing less than 1500 g.			
5.	Uses sterile gloves during wound dressing and invasive procedures			
6.	Wear non-sterile gloves when inserting a peripheral venous catheter (cannula) in a full-term neonate.			
7.	Wear non-sterile gloves when suctioning upper respiratory aspiration or tube-feeding neonates.			
8.	Change gloves when visibly soiled, torn or punctured			
9.	Wears gloves when handling contaminated waste items or touching contaminated surfaces			
10.	Used gloves as single-use items			
11.	Keeping fingernails short and/or not using artificial nails			
12.	Only sterile water is used to prepare and dilute medicine vials.			
13.	Make sure of the name of the medicine to be prepared and that it is valid; it is strictly forbidden to use expired medicines.			
14.	The rubber cap on the medicine vial is disinfected with alcohol before it is punctured and left to dry.			

15.	Aprons or gowns are worn when close contact with the neonates' excretion or secretion is anticipated (when there is a risk that clothing may become contaminated).			
16.	Wear gowns as single-use technique.			
17.	Wear leather or plastic gowns (apron or gown) when washing and disinfecting incubators and instruments.			
18.	Wear a non-sterile gown when receiving a baby after birth.			
19.	Wear a non-sterile gown when cleaning neonate patients.			
20.	Wear a high-efficiency respirator (N95) when entering the isolation room for a neonate patient with airborne diseases.			
21.	Face shields are worn where there is a risk of blood, body fluids, secretions, or excretions splashing into the face.			
22.	Face masks are worn when solutions are mixed to prevent contamination of the sterile field with exhaled air.			
23.	Wearing a face mask when aspirating neonates from an ETT.			
24.	Face masks are worn when washing contaminated tools and incubators.			
25.	Use a head cap when cleaning tools and machines to be sterilized.			
26.	Wear reinforced, impermeable rubber shoes during work.			

5.Nurses' practice of sterilization/ disinfection.

Direction: please consider the following behavior as they relate to your practice. You should consider your reaction to each behavior and put (√) in the column you have chosen

NO	Parameter	Response		
		Never done	Some times	Always
1.	Neonatal nurse providers are responsible for cleaning and disinfecting all medical tools and devices daily.			
2.	Washing instruments with clean water takes place in a designated place outside the neonate's hall, and there is a washbasin and basin for washing tools.			
3.	Reusable tools are immersed in (Sidex solution) for 10 hours before cleaning them for reuse.			
4.	Instruments are washed with water as a precondition for sterilization.			
5.	Cleans bathing bowls of neonates with disinfectants after bathing each neonates			
6.	Ensure the hospital floors and surfaces are decontaminated. Decontaminates the neonates' lockers and cupboards using chemical agents once daily.			
7.	Disinfects the neonate's incubator after discharge and before admission of another			
8.	The incubator is disinfected every 7 days for the full term and every 5 days for the preterm.			
9.	After using the incubator, all removable parts must be thoroughly washed and cleaned with detergent.			
10	Rinse and dry thoroughly using disposable paper towels. Then all parts of the incubator must be disinfected with cervanius or alcohol (70%).			
11.	Ventilate the incubator before reusing it.			
12.	Washes disinfect and sterilized the feeding utensils before and after use			
13.	Incubators are disinfected and cleaned daily while the neonate is inside them using a piece of cloth moistened with alcohol.			

6.Factors influencing adherence to infection control

Direction: please consider the following behavior as they relate to your practice. You should consider your reaction to each behavior and put (√) in the column you have chosen

NO	Parameter	Response				
		Strongly Agree	Agree	Neutral	Not agree	objection
1.	Soap or paper for drying hands is not always available in the department.					
2.	There are no handwashing basins near the station at the department.					
3.	Hand sanitizer supplies (designated alcohol) approved by the Ministry of Health are available.					
4.	According to international specifications the nurse should not walk more than eight steps to the sink to wash hands.					
5.	There is a designated area outside the neonatal patient room for cleaning medical equipment.					
6.	Firm belief about the effectiveness of hand washing					
7.	Frequent hand hygiene leads to dry skin and hand irritation.					
8.	Hand hygiene supplies are available in the waiting areas.					
9.	The lack of warm water for hand washing leads to dry hands.					
10.	Neonatal nurse workers use gloves instead of hand washing.					
11.	Wear rings while providing nursing care to neonates.					
12.	Workload and the number of neonates to be cared for have an impact.					
13.	I think wearing gloves to prevent infection is an alternative to hand sanitizing.					
14.	There are no boards available to explain infection control practices.					
15.	Lack of guidelines or protocols for explaining practicing infection control					
16.	The head nurse provides nursing staff feedback about hand hygiene.					
17.	The supervisor of infection control monitors neonatal nursing staff to give feedback about hand hygiene.					
18.	Environment (internal context) not promoting hand hygiene					
19.	The application of encouragement methods by hospital officials					

Annex (3) Self-administered questionnaire Arabic

نموذج الموافقة

الاستبيان

عزيزي الممرض/ة المحترم/ة ،،

أنا الباحث/ **محمد عبد الله محمد الحلو** ماجستير تمريض الأطفال من كلية الدراسات العليا – جامعة القدس أبو ديس، أقوم بإجراء هذا البحث كمتطلباً للحصول على درجة الماجستير، ويسعدني مشاركتك في دراسة بحثية بعنوان "ممارسات ممرضي حديثي الولادة في مجال مكافحة العدوى في وحدات رعاية أطفال حديثي الولادة في المستشفيات الحكومية في قطاع غزة" مع العلم أن تمويل هذا البحث من الباحث نفسه.

أود إعلامك أن المشاركة في هذا البحث طوعية ولديك كامل الحق في التوقف عن المشاركة في أي وقت وعدم الإجابة على أي سؤال في الاستبانة وأوكد أن استخدام هذه البيانات لأغراض البحث العلمي فقط وأنه سيتم التعامل مع إجابتك بسرية تامة دون الحاجة لكتابة الاسم عند الإجابة على الاستبانة.

كلي أمل أن يتم الإجابة بموضوعية على الأسئلة الواردة في الاستبيان من خلال وضع علامة على الإجابة التي تراها مناسبة في المساحة المخصصة لها لأن رأيك له أهمية كبيرة في هذه الدراسة. ستستغرق هذه الدراسة حوالي 15 دقيقة فقط.

الباحث: محمد عبد الله محمد الحلو

التوقيع

البيانات الديموغرافية الشخصية: يرجى وضع علامة (√) على الخانة الصحيحة

الجنس	☐ ذكر	☐ أنثى		
العمر	..... سنة			
الحالة الاجتماعية	☐ أعزب	☐ متزوج	☐ مطلق / أرمل	
المستوى العلمي	☐ دبلوم	☐ بكالوريوس	☐ماجستير	☐دكتوراه
المسمى الوظيفي الحالي	ممرض ☐ عملي	☐ حكيم جامعي	☐ رئيس قسم	
المستشفى	مستشفى ☐الاقصى	مستشفى الشفاء ☐ الولادة	مستشفى الرنتيسي "النصر" ☐ للأطفال	
	مستشفى ☐الامارتي	مستشفى غزة ☐الاوروبي	مستشفى التحرير "مجمع ناصر" ☐	
سنوات الخبرة	12-6 ☐ شهر	☐ 1-5 سنوات	10-6 ☐ سنوات	11 سنة ☐فأكثر

.	هل حصلت على أي دورة أو برنامج تعليمي متعلق بمكافحة العدوى؟			
	☐ نعم ☐ لا			
.	هل تلقيت تدريبًا على ممارسات مكافحة العدوى؟			
	☐ نعم ☐ لا			
.	إذا كانت الإجابة بنعم على السؤال (ب)، فمتى تلقيت تدريبًا على مكافحة العدوى؟			
	☐ العام الماضي	خلال العامين الماضيين ☐	☐ أكثر من عامين	
.	مكان تلقي التدريب على ممارسات مكافحة العدوى			
	☐ ورشة عمل	الدراسة الجامعية ☐	دورات ☐تدريبة	خلال العمل في ☐ مستشفى

المجال الاول: ممارسة ممرضي أقسام الحضانة فيما يتعلق بغسل اليدين

الرقم	العناصر	الاجابة		
		أبداً	أحياناً	دائماً
.1	أغسل اليدين قبل بدء العمل عند دخول قسم الحضانة.			
.2	أغسل اليدين بعد انتهاء العمل قبل التوجه للمنزل.			
.3	أقوم بخلع كافة الملحقات (الأساور، والساعات، والخواتم) قبل غسل اليدين واشطف اليدين تحت الماء الجاري.			
.4	اغسل اليدين بعد استعمال الكمبيوتر والتليفون داخل القسم.			
.5	أغسل اليدين بالماء والصابون قبل ملامسة المريض.			
.6	أغسل اليدين بالماء والصابون بعد ملامسة محيط المريض.			
.7	أغسل يدي قبل ارتداء القفازات.			
.8	أغسل يدي بعد خلع القفازات.			
.9	أغسل اليدين وفقا للحظات الخمس لمنظمة الصحة العالمية أثناء تعاملي مع المرضى (قبل ملامسة المريض–قبل اجراء التنظيف او التطهير–بعد خطر التعرض لسوائل من جسم المريض–بعد ملامسة المريض–بعد ملامسة محيط المريض).			
.10	اغسل اليدين بعد لمس أي سطح محتمل التلوث.			
.11	أغسل اليدين بعد التعرض لسوائل او افرازات من جسم المريض مثل (الدم ومشتقاته، البول، اللعاب، البلغم) او ملامسة الجروح.			
.12	أغسل اليدين بالماء والصابون فقط.			
.13	أغسل اليدين بالماء والصابون عندما تكون متسخة بشكل واضح.			
.14	اغسل يدي غسيل جراحي عند مساعدة الطبيب في تركيب قسطرة وريدية مركزية.			
.15	يتم شطف اليدين بالماء الجاري وتجفيف الايدي جيدا باستخدام مناديل ورقية.			
.16	تغسل اليدين لمدة تتراوح من 40–60 ثانية عن طريق دعكهما بالماء من طرف الإصبع إلى الرسغ.			
.17	أغلق صنبور الماء باستخدام الكوع او المناديل الورقية بعد الانتهاء من الغسل.			

المجال الثاني: ممارسة ممرضي أقسام الحضانة فيما يتعلق بتطهير اليدين بواسطة الكحول المخصص

الرقم	العناصر	الإجابة		
		أبداً	أحياناً	دائماً
.1	استعمل الكحول المخصص لتطهير اليدين لمدة 20–30 ثانية على الأقل.			
.2	أتأكد بأن اليدين جافة ولا يوجد عليها أي اوساخ ظاهرية قبل استعمال الكحول المخصص لتطهير الايدي.			
.3	أفرك اليدين بالكحول المخصص فقط دون غسل اليدين بالماء والصابون إذا لم يكن عليها تلوثا ظاهريا.			
.4	افرك باطن اليد بباطن اليد الاخرى			
.5	افرك باطن اليد اليمنى على ظهر اليد اليسرى مع تداخل الاصابع والعكس.			
.6	افرك ظاهر الاصابع بباطن اليد الأخرى والاصابع-مضمومة.			
.7	أقوم بدلك الابهام الايسر ثم الايمن بشكل دائري.			
.8	أقوم بدلك أصابع اليد اليمنى بباطن اليد اليسرى والعكس بشكل دائري.			

المجال الثالث: ممارسة ممرضي أقسام الحضانة فيما يتعلق بطرق التخلص من المخلفات

الرقم	العناصر	الإجابة		
		أبداً	أحياناً	دائماً
1.	يلتزم الممرضين العاملين في أقسام حديثي الولادة بسياسات فرز النفايات الطبية المعتمدة. بشكل مناسب (لا يتم ملاحظة أي نفايات طبية خطيرة أو أشياء حادة خارج الحاويات المحددة).			
2.	توضع الشراشف المتسخة في سلة الغسيل ويغلق بعد ذلك.			
3.	أضع الورق المستعمل في سلة المهملات بالأكياس المخصصة لها (الأسود) حسب سياسة فرز النفايات المعتمدة.			
4.	أضع الأشياء الملوثة بمواد معدية مثل القيح أو الدم أو سوائل الجسم أو البراز أو الإفرازات في كيس النفايات الأصفر.			
5.	أضع القمامة والمستهلكات التي تستخدم لمرة واحدة بما في ذلك الضمادات والمناديل، في كيس النفايات الأسود.			
6.	الأجسام الحادة (مثل الإبر والشفرات والأدوات المعدنية) توضع في صندوق الامان المقاوم للثقب والتسرب.			
7.	لا يتم تمرير الأدوات الحادة مباشرة من يد إلى أخرى.			
8.	لا أفصل الإبرة عن السرنجة قبل التخلص منها.			
9.	أتخلص من الإبر المستعملة أو الأشياء الحادة في صناديق الأمان على الفور.			
10.	لا أقوم بإعادة تغطية الإبرة بعد الاستخدام.			
11.	أتحمل المسؤولية الشخصية عن أي أشياء حادة أستخدمها وأتخلص منها في صندوق الامان.			
12.	تتوفر جميع أنواع حاويات النفايات بأعداد كافية وتوضع في أماكن مخصصة يسهل الوصول إليها.			
13.	لا يتم ملء العبوات الحادة (صندوق الأمان) بأكثر من الثلثين ويتم تخزينها في منطقة بعيدة عن الزوار وأقارب المرضى.			
14.	يتم التخلص من صندوق الأمان بعد مرور 7 أيام من تاريخ فتحه كحد اقصى.			

المجال الرابع: ممارسة ممرضي أقسام الحضانة فيما يتعلق بالالتزام بالأساليب المانعة للتلوث

الرقم	العناصر	الإجابة		
		أبداً	أحياناً	دائماً
.1	ارتدي القفازات بشكل مناسب دون تلويثها (على سبيل المثال عدم لمس سطح القفازات المعقمة أثناء عملية ارتدائها).			
.2	ارتدي قفازات عند التعامل مع مناطق معقمة وجلد مخدوش (مثل أماكن النزيف) أو الأغشية المخاطية.			
.3	استخدم قفازات معقمة عند مساعدة الطبيب في التدخلات التي تحتاج الى وسط معقم مثل (تركيب قسطرة بولية –تركيب قسطرة وريد مركزي–تركيب أنبوب بالصدر –أخذ عينة من النخاع الشوكي).			
.4	ارتدي القفازات المعقمة عند تركيب قسطرة وريدية طرفية (كانيولا) للأطفال حديثي الولادة ناقصي النمو (Preterm) الذين يقل وزنهم عن 1500 جم.			
.5	استخدم قفازات معقمة أثناء الغيار على الجروح والحروق وسحب عينات مزارع الدم.			
.6	ارتدي القفازات غير معقمة عند تركيب قسطرة وريدية طرفية (كانيولا) للأطفال حديثي الولادة مكتملي النمو.			
.7	ارتدي قفازات غير معقمة عند القيام بالتشفيط من الجهاز التنفسي العلوي أو التغذية بواسطة الانبوب المعدي للأطفال حديثي الولادة.			
.8	أقوم بتغيير القفازات عندما تكون متسخة بشكل واضح أو ممزقة أو مثقوبة.			
.9	ارتدي قفازات عند التعامل مع النفايات الملوثة أو لمس الأسطح الملوثة.			
.10	يتم التخلص من القفازات بعد الاستخدام لمرة واحدة.			
.11	احافظ على اظافري قصيرة ولا استخدام أظافر صناعية عند رعايتي للمريض.			
.12	يتم استخدام امبولات الماء المعقم فقط لتحضير قوارير الأدوية وتخفيفها.			
.13	أتأكد من اسم الدواء المراد تحضيره وانه ساري الصلاحية وامتنع منعا باتا عن استخدام ادوية منتهية الصلاحية.			
.14	يتم تطهير الغطاء المطاطي الموجود على قنينة الدواء بالكحول 70% قبل ثقبه وتركه ليجف.			
.15	ارتدي المريول الجراحي (Apron) المخصص للاستخدام لمرة واحدة ويتم التخلص منه.			
.16	يتم ارتداء العباءات الجلدية او البلاستيكية (Gown،Apron) عند القيام بالإجراءات التي يحتمل معها تناثر الدم او سوائل او افرازات م (عندما يكون هناك خطر من أن الملابس قد تتلوث).			
.17	يتم ارتداء العباءات الجلدية او البلاستيكية (Gown،Apron) عند عملية غسيل			

	وتطهير الحضانات والأدوات.				
18.	ارتدي العباءات الغير معقمة (Non-sterile Gown) عند استقبال طفل بعد الولادة.				
16.	ارتدي العباءات الغير معقمة (Non-sterile Gown) عند تنظيف جسم مرضى حديثي الولادة.				
17.	يتم ارتداء كمامة عالية الكفاءة (N95) عند الدخول إلى غرفة العزل للمريض حديثي الولادة المصابين بالأمراض المنقولة عبر الهواء.				
18.	يتم ارتداء قناع الوجه الواقي (Face shield) في الأماكن التي يوجد بها خطر تناثر الدم أو سوائل الجسم أو الإفرازات أو الإفرازات على الوجه.				
19.	يتم ارتداء الكمامة أثناء خلط المحاليل الوردية لمنع تلوث المجال المعقم بهواء الزفير.				
20.	يتم ارتداء الكمامة عند التشفيط لمرضى حديثي الولادة من أنبوب التنفس الرغامي ETT.				
21.	يتم ارتداء الكمامة عند غسيل الأدوات الملوثة والحضانات.				
22.	استخدم غطاء الرأس عند تنظيف الأدوات والآلات المراد تعقيمها.				
23.	اقوم بارتداء الأحذية المطاطية المقوية وغير المنفذة للسوائل خلال العمل.				

المجال الخامس: ممارسة ممرضي أقسام الحضانة فيما يتعلق بالتعقيم / التطهير

الرقم	العناصر	الإجابة		
		أبداً	أحياناً	دائماً
.1	يتولى تمريض الحضانة مسؤولية تنظيف وتطهير جميع الادوات والأجهزة الطبية يوميا.			
.2	تتم عملية تنظيف الأدوات او الأجهزة الطبية في مكان مخصص خارج صالة المرضى ومتوفر فيه مغسلة وحوض لغسيل الأدوات.			
.3	تغمر الأدوات التي يعاد استخدامها في محلول (Sidex) لمدة 10 ساعات قبل عملية التنظيف لها لإعادة استخدامها.			
.4	تغسل الأدوات بالماء كشرط مسبق للتعقيم.			
.5	يتم تنظيف أحواض الاستحمام لحديثي الولادة بالمطهرات بعد الاستحمام.			
.6	يتم تطهير أرضيات / أسطح المستشفى بشكل متكرر، يتم تطهير الخزائن الخاصة بحديثي الولادة باستخدام عوامل كيميائية مرة واحدة يوميًا.			
.7	تطهير حاضنة الطفل حديثي الولادة بعد خروجه منها وقبل دخول حالة أخرى.			
.8	يتم تطهير الحضانة كل 7 أيام لمكتملي النمو (Full term)وكل 5 أيام لمنقوصي النمو (Preterm).			
.9	بعد استخدام الحاضنة، يجب غسل جميع الأجزاء القابلة للإزالة جيدًا وتنظيفها باستخدام المنظفات.			
.10	يتم شطف وتجفيف الحاضنة جيدًا باستخدام مناشف ورقية يمكن التخلص منها. ثم يجب تطهير جميع أجزاء الحاضنة بمادة السيرفانيوس أو الكحول (70٪).			
.11	أقوم بتهوية الحاضنة قبل إعادة استخدامها.			
.12	يغسل ويعقم أواني التغذية (رضاعات الأطفال) قبل وبعد الاستعمال.			
.13	يتم تطهير وتنظيف الحضانات يوميا والطفل موجود بداخلها من خلال استخدام قطعة مبللة بالكحول.			

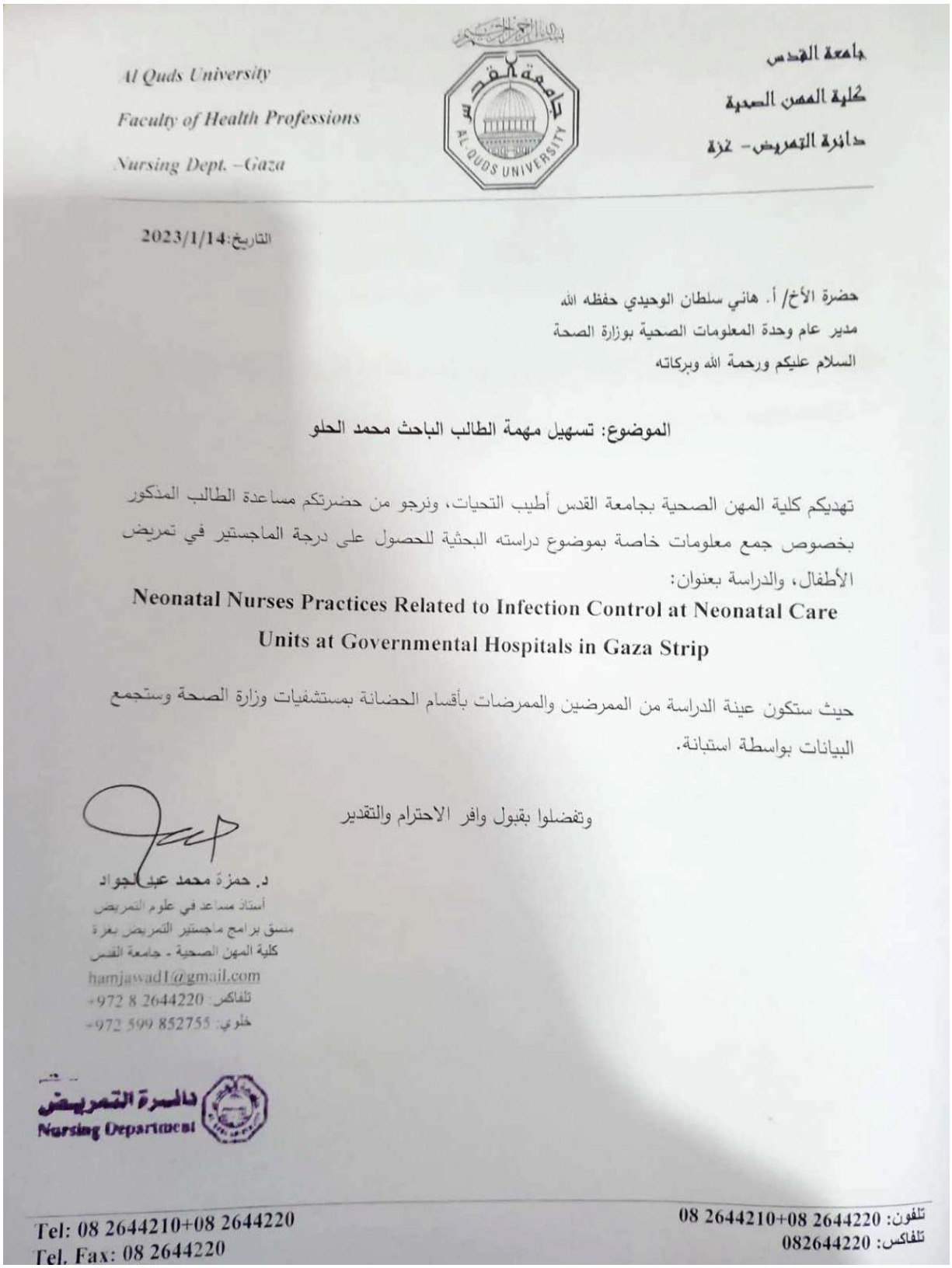
المجال السادس: ممارسة ممرضي أقسام الحضانة فيما يتعلق بالعوامل المؤثرة على الالتزام بمكافحة العدوى

الرقم	العناصر	الإجابة				
		موافق بشدة	موافق	محايد	غير موافق	معارض بشدة
.1	لا يتوفر صابون أو ورق تجفيف الايدي باستمرار بالقسم.					
.2	لا توجد مغاسل لغسل الايدي قريبة من الحضانات.					
.3	تتوفر مستلزمات التطهير اليدين (الكحول المخصص) المعتمدة من وزارة الصحة.					
.4	حسب المواصفات العالمية. يجب الا يسير الممرض أكثر من 8 خطوات الى المغسلة لغسل اليدين.					
.5	يوجد مكان مخصص خارج صالة مرضى حديثي الولادة لتنظيف الأجهزة الطبية.					
.6	لدي إيمان راسخ بفاعلية غسل اليدين.					
.7	الغسيل المتكرر بالماء والصابون لليدين يؤدي الى جفافهما.					
.8	تتوفر مستلزمات نظافة اليدين في مناطق الانتظار.					
.9	عدم توفر الماء الدافئ لغسل اليدين يؤدي الى جفاف اليدين.					
.10	يستخدم تمريض حديثي الولادة القفازات بدلاً من غسل اليدين.					
.11	ارتدي الخواتم أثناء تقديم الرعاية التمريضية للأطفال حديثي الولادة.					
.12	عبء العمل وعدد مرضى حديثي الولادة الذين يتعين رعايتهم له تأثير على الالتزام بإجراءات مكافحة العدوى.					
.13	اعتقد بأن ارتداء القفازات لمنع نقل العدوى يعتبر بديلا عن تطهير الأيدي.					
.14	لا تتوفر لوحات ارشادية لشرح ما يتعلق بممارسة مكافحة العدوى.					
.15	لا تتوفر بروتوكولات داخل القسم توضح الإجراءات وأهداف ممارسة مكافحة العدوى.					
.16	يقدم رئيس القسم ملاحظات لطاقم تمريض حديثي الولادة حول نظافة اليدين.					
.17	يراقب مشرف مكافحة العدوى طاقم تمريض حديثي الولادة لإبداء الرأي حول نظافة اليدين.					
.18	بيئة العمل لا تعزز نظافة اليدين.					
.19	من الأهمية تطبيق الإدارة لطرق تشجيعية لممارسة مكافحة العدوى داخل اقسام الحضانة.					

Annex (4) Name of panels of expert

1. Dr. Ahmad Nijim (Al Azhar University – Gaza)
2. Dr Rami Al-Abadla (Infection Control Unit)
3. Dr. Hamza Abdeljawad (Al Quds University – Gaza)
4. Dr. Abdul Rahman Al-Hamos (Palestine College of Nursing)
5. Dr. Osama Elian (Palestine College of Nursing)

Annex (5) Al-Quds University approval Latter



Al Quds University
Faculty of Health Professions
Nursing Dept. –Gaza

جامعة القدس
كلية المهن الصحية
دائرة التمريض- غزة

التاريخ:2023/1/14

حضرة الأخ/ أ. هاني سلطان الوحيدي حفظه الله
مدير عام وحدة المعلومات الصحية بوزارة الصحة
السلام عليكم ورحمة الله وبركاته

الموضوع: تسهيل مهمة الطالب الباحث محمد الحلو

تهديكم كلية المهن الصحية بجامعة القدس أطيب التحيات، ونرجو من حضرتكم مساعدة الطالب المذكور بخصوص جمع معلومات خاصة بموضوع دراسته البحثية للحصول على درجة الماجستير في تمريض الأطفال، والدراسة بعنوان:

Neonatal Nurses Practices Related to Infection Control at Neonatal Care Units at Governmental Hospitals in Gaza Strip

حيث ستكون عينة الدراسة من الممرضين والممرضات بأقسام الحضانة بمستشفيات وزارة الصحة وستجمع البيانات بواسطة استبانة.

وتفضلوا بقبول وافر الاحترام والتقدير

د. حمزة محمد عبد الجواد
أستاذ مساعد في علوم التمريض
منسق برامج ماجستير التمريض بغزة
كلية المهن الصحية - جامعة القدس
hamjawad1@gmail.com
تلفاكس: +972 8 2644220
خلوي: +972 599 852755

دائرة التمريض
Nursing Department

Tel: 08 2644210+08 2644220
Tel. Fax: 08 2644220

تلفون: 08 2644210+08 2644220
تلفاكس: 082644220

Annex (6) Helsinki committee

المجلس الفلسطيني للبحث الصحي

Palestinian Health Research Council

تعزيز النظام الصحي الفلسطيني من خلال مأسسة استخدام المعلومات البحثية في صنع القرار

Developing the Palestinian health system through institutionalizing the use of information in decision making

Helsinki Committee
For Ethical Approval

Date: 2023/02/06 **Number:** PHRC/HC/1239/23

Name: Mohammed Abd allh Elhelou الاسم:

We would like to inform you that the committee had discussed the proposal of your study about: نفيدكم علماً بأن اللجنة قد ناقشت مقترح دراستكم حول:

Neonatal Nurses Practices Related to Infection Control at Neonatal Care Units at Governmental Hospitals in Gaza Strip

The committee has decided to approve the above mentioned research. Approval number PHRC/HC/1239/23 in its meeting on 2023/02/06 وقد قررت الموافقة على البحث المذكور عاليه بالرقم والتاريخ المذكوران عاليه

Signature

Member **Chairman** **Member** Kaled Zimmo

Genral Conditions:-
1. Valid for 2 years from the date of approval.
2. It is necessary to notify the committee of any change in the approved study protocol.
3. The committee appreciates receiving a copy of your final research when completed.

Specific Conditions:-

E-Mail:pal.phrc@gmail.com

Gaza - Palestine غزة - فلسطين

شارع النصر - مفترق العيون

For ethical approval

Annex (7) Permission to collection data from MOH

State of Palestine
Ministry of health

دولة فلسطين
وزارة الصحة

السيد : هاني سلطان الوحيدي المحترم

التاريخ:22/01/2023
رقم المراسلة 1167333

مدير عام بالوزارة /الإدارة العامة للوحدات الإدارية المساعدة /وزارة الصحة

السلام عليكم ,,,

الموضوع/ تسهيل مهمة الباحث محمد عبد الله محمد الحلو

التفاصيل //
السلام عليكم
نهديكم أطيب التحيات ونود منكم تسهيل مهمة الباحث/ة محمد عبد الله محمد الحلو الملتحق/ة ببرنامج ماجستير تمريض الأطفال – جامعة القدس أبو ديس في إجراء بحث بعنوان
"ممارسات ممرضين حديثي الولادة في مجال مكافحة العدوى في وحدات رعاية أطفال حديثي الولادة في المستشفيات الحكومية في قطاع غزة"
حيث الباحث/ة بحاجة لتعبئة استبانة من عدد من العاملين في مرافق وزارة الصحة (المستشفيات: الشفاء – ناصر – الرنتيسي/النصر – الأقصى – الأوروبي – الهلال الاماراتي)، دون اجراء أي تدخل طبي او سحب عينات دم، نأمل توجيهاتكم لذوي الاختصاص بضرورة الحصول على الموافقة المستنيرة من المشاركين، بما لا يتعارض مع مصلحة العمل وضمن أخلاقيات البحث العلمي، ودون تحمل الوزارة أي أعباء أو مسئولية

وتفضلوا بقبول التحية والتقدير،

ملاحظات /
تسهيل المهمة الخاص بالدراسة أعلاه صالح لمدة 3 أشهر من تاريخه.
يرجى التأكد من توافق أسئلة الاستبانة المرفقة والتي يتم تعبئتها ميدانيا على ان لا يتم أي إضافة او تعديل دون موافقة دائرة البحث الصحي

علي حسن البلبيسى
حكيم جامعي

المرفقات
- ادوات البحث محمد الحلو.pdf

Gaza Tel. (+970) 8-2846949
Fax. (+970) 8-2826295

غزة تلفون. (+970) 8-2846949
فاكس. (+970) 8-2826295

عنوان الدراسة: ممارسات ممرضي حديثي الولادة في مجال مكافحة العدوى في وحدات رعاية أطفال حديثي الولادة في المستشفيات الحكومية في قطاع غزة.

إعداد: محمد عبدالله محمد الحلو

إشراف: د. محمد الجرجاوي و د. أشرف الجدي

ملخص الدراسة

الأطفال حديثي الولادة فئة ضعيفة تتطلب عناية خاصة واحتياطات أثناء وجودهم في المستشفى. تظل وفيات الأطفال حديثي الولادة مشكلة على مستوى العالم، فهناك ما يقرب من 6700 حالة وفاة بين الأطفال حديثي الولادة كل يوم في عام 2020. وللأسف، فإن معظم الوفيات ناتجة عن ظروف يمكن الوقاية منها من خلال رعاية الأطفال حديثي الولادة المناسبة. للممرضين دوراً حيوياً في مراقبة علامات وأعراض عدوى الأطفال حديثي الولادة، وهو أمر مهم جداً للتشخيص المبكر والتدخل. هدفت الدراسة إلى تقييم ممارسات ممرضي حديثي الولادة في مجال مكافحة العدوى في وحدات رعاية الأطفال حديثي الولادة في المستشفيات الحكومية في قطاع غزة. كان تصميم الدراسة مقطعية كمية وصفية أجريت في وحدات رعاية الأطفال حديثي الولادة التابعة للمستشفيات الحكومية. شارك في الدراسة 167 مشاركاً، وزع الاستبيان بينهم في ستة مستشفيات حكومية في قطاع غزة. وأظهرت النتائج أنه من بين 167 مشاركاً، كان أكثر من النصف (51.5٪) من الإناث، وأعلى فئة عمرية كانت من هم فوق 35 عامًا (37.1٪). وكانت أعلى فئة من حيث المستوى التعليمي الحاصلين على شهادة البكالوريوس بمتوسط نسبة 79٪. أظهرت النتائج أن المرضى حديثي الولادة يتمتعن بمستوى عالٍ من ممارسة غسل اليدين بمتوسط نسبة 86.62٪. أما غسل اليدين بعد استخدام الكمبيوتر والهاتف داخل الوحدات فقد بلغ متوسط النسبة 76٪. أيضًا، النسبة المئوية لممارسة فرك اليدين 81.74٪. بينما كانت نسبة 82.14٪ حول طرق التخلص من النفايات ونسبة 71.46٪ حول استخدام الحواجز المادية، وحول ممارسات تعقيم وتطهير بمتوسط نسب 82.4٪. حول العوامل المؤثرة على الالتزام بمكافحة العدوى، بمتوسط معدل 74.12٪. أوصت الدراسة بمواصلة الدورات التدريبية حول ممارسة مكافحة العدوى من خلال البرامج التعليمية والتدريبية والمحاضرات المنتظمة لممرضي الأطفال حديثي الولادة من أجل الحفاظ على ممارسة أفضل لمكافحة العدوى.