

# **Nurses Compliance Regarding Infection Control Protocol in Critical Care Units (Assessment Study)**

*Thesis*

Submitted for Partial Fulfillment of Master Degree  
in Pediatric Nursing

**By**

**Amira Ahmed Eissa Mahmoud**

(B.Sc. Nursing, 2012)

Faculty of Nursing/ Beni Swif University

**Faculty of Nursing  
Ain Shams University  
2019**

# **Nurses Compliance Regarding Infection Control Protocol in Critical Care Units (Assessment Study)**

## *Thesis*

Submitted for Partial Fulfillment of Master Degree  
in Pediatric Nursing

**Supervised by**  
**Prof. Dr. Eman Amin Mohamed**

*Professor of Pediatric Nursing*  
*Faculty of Nursing/ Ain Shams University*

**Assist. Prof. Dr. Safaa Fouad Draz**

*Assistant Professor of Pediatric Nursing*  
*Faculty of Nursing/ Ain Shams University*

**Faculty of Nursing**  
**Ain Shams University**  
**2019**



## Acknowledgement

*Foremost, I feel always indebted to **Allah** to whom I relate any success in First and achieving any work in my life.*

*I would like to express my deepest appreciation to **Prof. Dr. Iman Amen Mohamed**, Professor of Pediatric Nursing, Faculty of Nursing, Ain Shams University, who devoted much of her time and effort for the completion of this work.*

*I also would like to express my gratitude to **Assist. Prof. Dr. Safaa Fouad Draz**, Assistant Professor of Pediatric Nursing, Faculty of Nursing, Ain Shams University, for her assistance, continuous directions and support throughout the whole work.*

*Special thanks are also extended to all the participants in this work.*

***Candidate name***

***✍. Amara Ahmed***

## Contents

Title	Page
List of Tables.....	I
List of Figures.....	IV
List of Abbreviations.....	V
Opertional Defination.....	VII
Abstract.....	VI
• <b>Introduction and Aim of the Study</b> .....	1
• <b>Review of Literature</b>	
➤ <b>Part 1:</b> Overview of infection .....	8
➤ <b>Part 2:</b> Infection control guideline protocol.....	25
➤ <b>Part 3:</b> Nurse role to prevent and control of infection .....	44
➤ <b>Part 4:</b> Role of nurses in infection control in critical.....	51
➤ <b>Part 5:</b> Nurses' Compliance with Standard Precautions of Infection Control in Pediatric Critical Care Units.....	67
• <b>Subjects and Methods</b> .....	75
• <b>Results</b> .....	83
• <b>Discussion</b> .....	116
• <b>Conclusion and Recommendations</b> .....	136
• <b>Summary</b> .....	138
• <b>References</b> .....	143
• <b>Appendices</b> .....	163
• <b>Arabic Summary</b> .....	-

---

## List of Tables

No	Table Title	Page Number
1	Number and percentage distribution of the nurses`according to their personal characteristics	84
2	Number and percentage distribution of the studied nurses` knowledge concerning infection in pediatric critical care units	86
3	Number and percentage distribution of the nurses` knowledge about the method of infection transmission in pediatric critical care units	88
4	Number and percentage distribution of nurses` knowledgea bout preventive measure for infection in pediatric critical care units.	90
5	Number and percentage distribution of nurses` practical knowledge regarding Personal protective equipment in pediatric critical care units	91
6	Number and percentage distribution of nurses` practical knowledge about Preventive precautions to limit infection in pediatric critical care units	92
7	Number and percentage distribution of nurses` practical knowledge about using disinfectant and sterilization of instruments in pediatric critical care units	93
8	Number and percentage distribution of nurses` practical knowledge about barriers that prevent infection control procedures application in pediatric critical care units	94
9	Number and percentage distribution of nurses` total knowledge	95
10	Number and percentage distribution of nurses` practice in hand washing compliance	97
11	Number and percentage distribution of nurses` practice according to wearing the Personal protective barrier	98

No	Table Title	Page Number
12	Number and percentage distribution of nurses' practice related to cannula insertion	99
13	Number and percentage distribution of nurses' practice maintenance closed cycle of the IV fluid	100
14	Number and percentage distribution of nurses' to their practice according to their mixing and preparing of intravenous fluid	101
15	Number and percentage distribution of nurses' practice regarding central venous catheterization	102
16	Number and percentage distribution of nurses to their practice according to laryngeal tube care	103
17	Number and percentage distribution of nurses to their practice according to suction procedure	104
18	Number and percentage distribution of nurses' to their practice according to follow aseptic techniques during nasogastric tube care	105
19	Number and percentage distribution of nurses' to their practice according to follow aseptic techniques during the caring with pediatric connected on mechanical ventilation	106
20	Number and percentage distribution of nurses' practice according to dealing with blood and body secretion	107
21	Number and percentage distribution of nurses' total practices	108
22	Relation between nurses knowledge and their demographic characteristics concerning the concept of infection among pediatric critical care units	110

No	Table Title	Page Number
23	Relation between nurses' knowledge about the method of infection in pediatric critical care units and their demographic characteristics	111
24	Relation between nurses' evaluation for their knowledge on preventive measures of infection in critical care units for pediatric and their demographic characteristics	112
25	Relation between nurses' total knowledge as regarding infection control and their demographic characteristics	113
26	Relation between nurses' total practice and their demographic characteristics	114
27	Correlation between total nurses' knowledge and their practice	115

## List of Figures

No	Figure Title	Page Number
1	Distribution of nurses' total knowledge concerning the concept of infection in critical care units	87
2	Distribution of nurses' total knowledge about method of infection transmission, in pediatric critical care units	89
3	Number and percentage distribution of nurses' total knowledge	96
4	Number and percentage distribution of nurses' total practice	109



## List of Abbreviations

<b>Abb.</b>	<b>Full term</b>
<b>AAFP</b>	American Academy of Family Physicians
<b>AAHP</b>	American Association of Health Plans
<b>AAP</b>	American Academy of Pediatrics
<b>AHD</b>	Alcohol-containing hand disinfection
<b>AIDS</b>	Acquireda Immune Deficiency Syndrome
<b>AIIR</b>	Airborne infection isolation room
<b>BSI</b>	Bloodstream infection
<b>CCUs</b>	Critical Care Units
<b>CDC</b>	Centers for Disease Control and Prevention
<b>CFUs</b>	Colony-foming-units
<b>CLABS</b>	Central Line Associated Bloodstream Infections
<b>CPAP</b>	Continuous positive airway pressure
<b>CRBSI</b>	Catheter-related bloodstream infection
<b>CRE</b>	Carpapenem resistant enterobacteriaceae
<b>DAI</b>	Device-associated infection
<b>DRSP</b>	Drug-resistant Streptococcus pneumonia
<b>ED</b>	Emergency department
<b>ESBL</b>	Extended spectrum beta-lactamases
<b>ESS</b>	Electronic surveillance software
<b>ETT</b>	Endo tracheal Tube
<b>H1N<sub>1</sub></b>	Influenz A virus (hemagglutin in neurminindase)
<b>HCP</b>	Healthcare personnel
<b>HCV</b>	Hepatitis C virus
<b>HCWs</b>	Health care workers
<b>HH</b>	Hand hygiene
<b>HICPAC</b>	Healthcare Infection Control Practices Advisory Committee
<b>HSN</b>	Healthcare Safety Network
<b>ICNs</b>	Infection Control nurses
<b>ICT</b>	Infection Control Team
<b>ID</b>	Infectious disease
<b>INICC</b>	International Infection Control Consortium

<b>Abb.</b>	<b>Full term</b>
<b>IP</b>	Infection prevention
<b>IV</b>	Intravenous
<b>MDROs</b>	Multidrug-resistant organisms
<b>mmHg</b>	Millimeter of hydrargyrm
<b>MRSA</b>	Methicillin resistant staphylococcus aureus
<b>NCID</b>	National Center for Infectious Diseases
<b>NCIRD</b>	National Center for Immunization and Respiratory Diseases
<b>NGIC</b>	National Guidelines for Infection Control
<b>NGT</b>	Nasogastric tube
<b>NHSM</b>	National Healthcare Safety Network
<b>Nis</b>	Infections
<b>NNIS</b>	National Infection Surveillance
<b>NPO</b>	Nothing per mouth
<b>O<sub>2</sub></b>	Oxygen
<b>PPE</b>	Personal protective equipment
<b>PPM</b>	Parts per million
<b>PS</b>	Pressure support
<b>SPO<sub>2</sub></b>	Saturation of blood oxygen
<b>SSI</b>	Surgical site infection
<b>STDs</b>	Sexually transmitted diseases
<b>USA</b>	United state of America
<b>VRE</b>	Vancomicine resistant enterocci
<b>WBC</b>	White blood cell count
<b>WHO</b>	World Health Organization

## Defination of Terms

<b>Antibodies</b>	Protective protein produced by the immune system in response to the presence of a foreign substance, called an antigen
<b>Bacteria</b>	Single-celledmicroorganisms vary either normal inhabitants (normal flora); or pathogens that produce disease
<b>Botulinum</b>	Is neurotoxic protien producedby bacterium
<b>Carrier</b>	A child who is colonized but not sick
<b>Colonization</b>	Presence of a germ in or on body without disease.
<b>Contagious</b>	Able to spread the illness
<b>Fungi</b>	Molds and yeasts Fungi colonize (live on or in a child) and are pathogens
<b>Guinea worm disease</b>	A parasitic disease caused by infection with the guinea worm (Dracunculus medinensis)
<b>Hospital-acquired infection</b>	An infection caught while hospitalized
<b>Host</b>	The route of transmission of some infectious diseases to humans and animals
<b>Incubation</b>	Time between infection and symptoms
<b>Infection</b>	A germ causing an illness body will react by making antibodies
<b>Intoxication</b>	Illness due to a toxin made by a germ
<b>Latent infection</b>	A germ (most often a virus) in a resting state
<b>Legionn air disease</b>	Is a lung infection that translated by inhaling droplets of water from air
<b>N95</b>	Type of face mask with filter facepiece respiratory use with infected disease less than 5 microns in diameter
<b>Normal flora</b>	Bacteria that live on or in a child

<b>Parasites</b>	Forms range from single cells (amoeba, protozoa) to worms
<b>Pathogen</b>	A germ that can cause a disease
<b>Prions</b>	Infectious proteins. The smallest known infectious agents
<b>Portal of entry</b>	Is the site through which micro-organisms enter the susceptible host and cause disease/infection tracts.
<b>Portal of exit</b>	Is the site from where micro-organisms leave the host to enter another host and cause disease/infection.
<b>Reactivation</b>	The latent germ wakes up and reproduces
<b>Reservoir</b>	Any person, animal, plant, soil or substance in which an infectious agent normally lives and multiplies.
<b>SARS</b>	A sever respiratory disease that is caused by a coronavirus
<b>Vector</b>	Any agent who carries and transmits an infectious pathogen into another living organism
<b>Vehicles</b>	Indirect transmission of an infectious agent that occurswhen a vehicle (or fomite) touches a person's body or is ingested
<b>Viruses</b>	Very small. Viruses take over cells to reproduce themselves
<b>Zoonotic disease</b>	Diseases that can be passed from animals to humans.

## Abstract

**Background:** Nurses compliance with infection control protocol in CCUs is very important to decrease morbidity and mortality of pediatric. **Aim:** This study aimed to assess nurses' compliance regarding infection control protocol in critical care units. **Research design:** A descriptive study was conducted to achieve the aim of this study. **Setting:** The study was carried out in pediatric critical care unit (intensive care units, emergency as well as medical and surgical department) at Eldemerdash Hospital in Ain Shams University and Fayoum University Hospital. **Subsujets:** convenient sample included 70 nurses who provide direct care for pediatric in the previous mentioned settings concerning their compliance to infection control protocol. **Tools:** Data collection include an âpre-désigne interviewions questionnaire skeet to asses knowledge of nurses and observation checklist was adopted from Guidelines of Ministry of Health to assess nurses' compliance with infection control protocol in CCUs. **Result:** There was 55.7% of nurses had unsatisfactory knowledge about method of infection transmission, in pediatric critical care units. There was 72% of nurses had competent practice regarding infection control. **Conclusion:** Nurses' compliance with standard precautions of infection control play an important role in preventing infection for all healthcare professionals, reduce infection and improve the pediatric safety. **Recommandations:** Continuous training the nursing staff to improve nurses' compliance towards infections control in critical care units.

---

**Keywords:** Compliance, Infection Control, Protocol, Critical Care Unit

## Introduction

Infections are the most frequent complications affecting pediatric in healthcare facilities especially in critical care units. Infection Control Protocol was designed to decrease the occurrence of infection in the hospitals and was developed to suit work nature in CCUs, Which in return can reduce the incidence of infections **(Escobar, et al., 2014).**

Infection was defined by the Center for Disease Control and Infection (CDC) and National Healthcare Safety Network (NHSN) as a localized or systemic condition resulted from an adverse reaction to the presence of an infectious agents or its toxins that occurs during a hospital admission 48 hours or more after hospital admission or within 30 days after discharge for which there is no evidence that the infection was present or incubating at admission, and meets body site specific criteria **(Kalantarzadeh, et al., 2014).**

The problems of infection and the ways to prevent them are influenced by factors such as employing aggressive methods, repeated changes in medical and surgical methods, changes in medical compounds, antibiotic treatment and formation of resistant micro-organisms. Hospital personnel,

especially the nurses who play an important role in spreading the infection and they are considered as key members of managing and controlling the hospital infections; therefore, nurses must have correct, up-to-date and appropriate scientific information regarding varieties of hospital infections, their effects on patients and increased hospital costs, recognition of people at risk and also the criteria to prevent and control infection (**Cheraghi, et al., 2011**).

The prevention of transmission between patients and to personnel requires that certain measures be taken with all patients, and that additional precautions be taken with some infections, based on the route of transmission. The prevention of transmission from personnel involves ensuring that personnel are appropriately immunized and counseled about working with infections. The prevention of infection also involves control of visitors, appropriate management of invasive procedures and devices, sterilization and disinfection of equipment, provision of a clean environment and adequate staffing (**Ministry of Health and population, 2016**).

Infection control protocol has great impact on the administrative, medical, legal, economic, ethical and social dimensions of critical care where medical and ethical