DETERMINANTS OF COMPLIANCE WITH INFECTION CONTROL PRECAUTIONS AMONG NURSES AT YANGON CHILDREN HOSPITAL

TOE MAUNG

M.B., B.S

Dip. Med. Sc. (Hospital Administration)

for the Degree of Master of Hospital Administration (MHA)

University of Public Health, Yangon

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Thesis submitted to
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This thesis has been approved by the Board of Examiners.

Chief Examiner

Examiner (1) **Examiner (2)**

ACKNOWLEDGEMENT

There are many honorable and respectful personnel to give my sincere gratitude in the process of doing this thesis for the fulfillment of Master degree. First of all, I would like to express my heartfelt thanks to Professor Hla Hla Win, Rector, University of Public Health, Yangon and members of the Institutional Review Board for giving opportunity to conduct this study.

I would like to express my deepest gratitude to Professor Kyawt Sann Lwin, Pro rector, University of Public Health, Yangon, Professor Ko Ko Zaw, Head of Department of Epidemiology and Dr. Kyaw Swa Mya, Associate Professor and Head of Department of Biostatistics and Medical Demography, University of Public Health, Yangon for their expert opinions and guidance in this study.

I would like to express my special thanks to Dr. Su Su Dwe, Senior Medical Superintendent, Yangon Children Hospital and Dr. Aye Aung, Senior Medical Superintendent, Yangon Specialist Hospital for their kind permission and support for this study.

I am really indebted to my supervisor, Dr. Aye Sandar Mon, Lecturer, Department of Biostatistics and Medical Demography, University of Public Health, Yangon for her kind support, guidance and suggestions throughout the study.

I wish to mention my sincere thanks to Dr. Aung Tun Oo, Deputy Senior Medical Superintendent, Dr. Aung Myint, Deputy Senior Medical Superintendent, Dr. Aung Thu Htet, Deputy Medical Superintendent and Matron Daw Htay Ye, Yangon Children Hospital for their kind support throughout the study. I am also grateful to specialist consultants, ward sisters, staff nurses and trained nurses who had helped me during observation in the patient wards.

Last, but not the least, I would like to express my sincere thanks to all the staff nurses and trained nurses from Yangon Children Hospital who had cooperated and participated in this study.

ABSTRACT

In developing countries including Myanmar, the magnitude and burden of hospital acquired infection is under estimated or even unknown because the diagnosis is complex as well as the surveillance activities need expertise and resources. Compliance with infection control precautions is a major problem worldwide in healthcare facilities resulting patients at higher risk of hospital acquired infections, longer duration of hospital stay, psychological effects, disability and death on patients. Nursing professionals are crucial role in the reduction of hospital acquired infections because they perform direct contact with patients, invasive procedures, the handling of instruments and patient equipment. This study aimed to assess the determinants of compliance with infection control precautions among nurses at Yangon Children Hospital. A cross-sectional hospital based study was conducted during August, 2019 to November, 2019 using self-administered questionnaires and observation checklists. The result showed that 55.6% (95% CI: 47.6%, 63.5%) of respondents had adequate knowledge, 67.5% (95% CI: 60.1%, 74.7%) had positive perception and 48.8%% (95% CI: 40.8%, 56.8%) had good practice on infection control precautions. Among the respondents, 68% of nurses had received training on infection control precautions. Staff nurses had significantly higher knowledge scores (P=0.016) and more positive perception on infection control precautions (P=0.033) than trained nurses. The training was significantly associated with perception towards infection control precautions and participant who got training had higher on positive perception than those without training (P=0.02). Trained nurses had statistically significant higher reported practice score than stuff nurses (P=0.013). About half of the participants complied strictly with infection control precautions (reported) in patient care. Supervision and monitoring on infection control practice should be done regularly by infection control committee. Periodic trainings on infection control precautions should be provided in order to keep the health care providers including newly employed nurses of updating knowledge and compliance. Further studies on compliance with infection control precautions among other health care professionals using mixed method approach should be conducted to assist in planning on infection control precautions.

CONTENTS

LIST OF ABBREVIATIONS

ABHR	Alcohol Based Hand Rubbing
BGH	Bago General Hospital
HAIs	Hospital Acquired Infections
HCAIs	Health Care Associated Infections
HCPs	Health Care Professionals
HCWs	Health Care Workers
HOU	Haematology and Oncology Unit
ICU	Intensive Care Unit
LMICs	Low and Middle-Income Countries
MOHS	Ministry of Health and Sports
OPD	Out Patient Department
OT	Operation Theatre
PPE	Personal Protective Equipment
PR	Private ward
SWH	Specialist Waibagi Hospital
TB	Tuberculosis
USA	United States of America
WHO	World Health Organization
YCH	Yangon Children Hospital

LIST OF TABLES

LIST OF FIGURES

CHAPTER (1)
INTRODUCTION

1.1 Background Information

A nosocomial infection also called “hospital acquired infection” can be defined as: “Infections acquired by patients after 48 to 72 hours during the process of receiving medical care in the hospital which was not present or incubating at the time of admission” (WHO, 2002).

An infection is caused by the complex relationship between an infectious agent and susceptible host. Transmission of infectious agents requires reservoir, susceptible host, and mode of transmission. In the hospital environment, health care providers, patients and visitors are susceptible host (Siegel et al, 2019).

Hospital acquired infections are wide spread and become public health problem with increasing economic and human impact because of increasing numbers and crowding of people, more frequent impaired immunity, new microorganisms and increasing bacterial resistance to antibiotics (WHO, 2002).

Hospital acquired infections occur worldwide and affect both developed and developing countries. Adequate approaches and guidelines have been present for many years and have been effective in some countries. However, the implementation of such guidelines in low and middle-income countries (LMICs) is not effective due to scarce resources and underdeveloped infrastructure (Sastry et al., 2017).

The factors affecting hospital acquired infection includes the increasing type of surgical procedures and invasive surgical techniques, the spread of drug-resistant bacteria among over crowded patients and attendants.

The compliance with infection control precautions can be strengthened by improving knowledge and perceptions of healthcare professionals (HCPs) (Aboelela, Stone and Larson, 2007).

Nursing professionals are very important in the prevention and control of hospital acquired infections because they carry out direct contact with patients, invasive procedures, the handling of instruments and patient equipment. Nurses take a crucial role in prevention and control of hospital acquired infections by following standard precautions and maintenance of the health care environment through their

knowledge, skills, and judgment to initiate appropriate and immediate infection control procedures (Canada, 2016).

Compliance with infection control precautions among nurses is important to prevent the occurrence and spread of infection during patient care and should maintain appropriate practice for all patients throughout the duration of their hospital stay.

Yangon Children Hospital (YCH) is 550 bedded tertiary and teaching hospital. As a tertiary hospital, there are three medical units, two surgical units, neonatal unit, physiotherapy unit, orthopaedic unit, neurology unit, renal unit, haematology unit, oncology unit, nutrition unit, burn unit, isolation unit, intensive care units, laboratory, blood bank, radiology department and other day care units at YCH. It was founded by Canada Government on (05-01-1970) and opened on (23-9-1978). Extended building of YCH was opened on (26-12-2009) and new extended building of YCH (Old Ministry of Health) was opened on (1-7-2011).

1.2 Problem Statement

Hospital acquired infections are associated with increased morbidity and mortality. Compliance with infection control precautions is a major problem worldwide in hospitals and especially in developing countries, resulting patients at higher risk of hospital acquired infections, longer duration of hospital stay, psychological effects, disability and death on patients, increasing extra costs on healthcare system and wider economy (Siegel et al., 2019).

Hospital acquired infections remain a global health problem even with advances in health care system and they are considered as one of the leading causes of morbidity and mortality. World Health Organization (WHO) estimates that over 1.4 million people suffer from hospital acquired infections at any one time, with the proportion of these infections being up to 20 times higher in low and middle income countries (WHO, 2005).

According to study, 6.4% of hospitalized patients in England (Health Protection Agency, 2012) and 7.1% in Europe develop hospital acquired infections. In Europe, hospital acquired infections cause 16 million extra patient days, 37,000 attributable deaths and contribute to an additional 110,000 every year. Annual economic impact is estimated at approximately € 7 billion, including direct costs only (Antimicrobial resistance surveillance in Europe, 2013).

In the USA, the Centers for Disease Control and Prevention reported that an estimated 1.7 million infections occur annually in hospitals with approximately 99,000 deaths were attributed to hospital acquired infections in 2002 and the annual financial losses were estimated at approximately US$ 6.65 billion in 2007 (Douglas and Ii, 2009).

It has been estimated that the risk of hospital acquired infection is 2 to 20 times higher in developing countries compared to developed countries and 5% and 10% of patients admitted to hospitals in developed countries acquire these infections (WHO, 2005)

The study on overall compliance to standard precautions, done in Specialist Hospital Waibagi (SHW), Yangon, Myanmar, showed that 73.5% of participants had good compliance with standard precautions practice. The determinants of non-compliance with infection control precautions are emergency situation, over workload, recapping of needles, not wearing gloves, improper hand washings, not using PPE and inadequate supply of resources (Sa-Sa-Aung, Nursalam, 2016).

The study done at Bago General Hospital (BGH) revealed that the knowledge on infection control was high only 19.8% of respondents and majorities were lacked of knowledge on mode of transmission of hospital infection. The demographic characteristics, knowledge and perception of nurses in BGH were not statistically significant to infection control precaution practice (May-Thu-Zaw, 2016).

1.3 Justification

In developing countries including Myanmar, the magnitude and burden of hospital acquired infection is under estimated or even unknown because the diagnosis is complex as well as the surveillance activities need expertise and resources.

Currently, Ministry of Health and Sports (MOHS), Myanmar has been strengthening the infection control activities for all public and private hospitals according to hospital infection control guidelines which was adopted by MOHS since 2016.

Most of the hospital acquired infections can be prevented by following strictly to the infection control precautions such as hand hygiene and wearing of gloves. Between 15% and 30% of hospital acquired infections are thought to be preventable through the application of standard infection control precautions. Compliance with standard precautions has been recognized as an efficient and effective means for

prevention and control hospital acquired infections in patients, attendants and health care providers.

Among the health care workers, nurses are often in touch with patients, and handle different types of instruments in hospitals and they can be source of hospital acquired infections. This is the main reason why nurses should comply strictly with infection control precautions such as hand washing in between contacts with patients, any invasive procedure, body secretions, excretions, and contaminated equipment.

The majority of health care professionals at Yangon Children Hospital are nurses and they take an important role in preventing and controlling transmission of hospital acquired infection through their knowledge and practice by following strictly to standard and additional infection control precautions. Children are more prone to hospital acquired infection than other patients. As YCH is a children hospital, nurses must comply with infection control precautions to reduce hospital acquired infection in children.

If nurses had adequate knowledge, perceptions and practice towards infection control precautions, there will be reduction in hospital acquired infection rate and complications due to hospital acquired infections on patients, health care providers and visitors.

Therefore, the study was done to assess the determinants of compliance with infection control precautions among nurses in a tertiary specialist care hospital. There was no previous study about knowledge, perception and practice of infection control precautions among nurses in YCH. This study would support the hospital administrators and healthcare professionals for improving prevention and control of hospital acquired infections.

CHAPTER (2)

LITERATURE REVIEW

2.1 Hospital acquired infection

"Hospital acquired infection (HAI) is an infection occurring in a patient in a hospital in whom the infection was not present or incubating at the time of admission and acquired during health care services but appearing after discharge and also occupational infection among the staff of the facility" (WHO, 2002).

The spread of hospital acquired infection needs agents, susceptible host, and a mode of spread. Health care providers, visitors and even patients are susceptible host in the hospital environment. The mode of transmission varies according to nature of microorganism and some organism takes more than one route. The interaction between an infectious agent and susceptible host produces hospital acquired infection (Siegel et al., 2019).

According to the sites of the infection, HAIs may be urinary infections, surgical site infections, nosocomial pneumonia, nosocomial bacteria and other nosocomial infections such as skin and soft tissue infections, gastroenteritis, sinusitis and other infections of reproductive organs etc. The casual organisms may be bacteria, viruses, parasites and fungi. Theses microorganisms can be acquired from permanent or transient flora of the patient, flora from another patient or member of staff and flora from healthcare environment (WHO, 2002).

Infection control is defined as the control measures and prevention of infection that protects vulnerable from getting an infection both in the general community and in hospitals while receiving care due to health problems. The simple and basic principle of infection control and prevention is hand washing. Hand washing is the most important activity which can reduce the transmission of infection (Alert, n.d.).

2.2 Infection control precautions in patient care

There are two types of infection control precautions, standard precautions and additional precautions. Standard or routine precautions to be followed for all patients includes washing hand promptly after contact with infective material, using no touch technique wherever possible, wearing gloves when in contact with blood, body fluids, secretions, excretions, mucous membranes and contaminated items, washing hand immediately after removing gloves, handling all sharps with extreme care, cleaning

spills of infective material promptly, ensuring that patient care equipment, supplies and linen contaminated with infective material is either discarded or disinfected or sterilized between each patient use, ensuring appropriate waste handling and boiling the linen soiled with infective material if no washing machine is available (WHO, 2002).

Additional precautions are used in addition to standard precautions for selected patients with airborne precautions (droplet nuclei <5um) (e.g. tuberculosis, chicken pox, measles), droplet precautions (droplet nuclei >5 um) (e.g. diphtheria, bacterial meningitis), contact precautions and absolute (strict) isolation.

2.3 Hand hygiene

The five moments of hand hygiene according to WHO

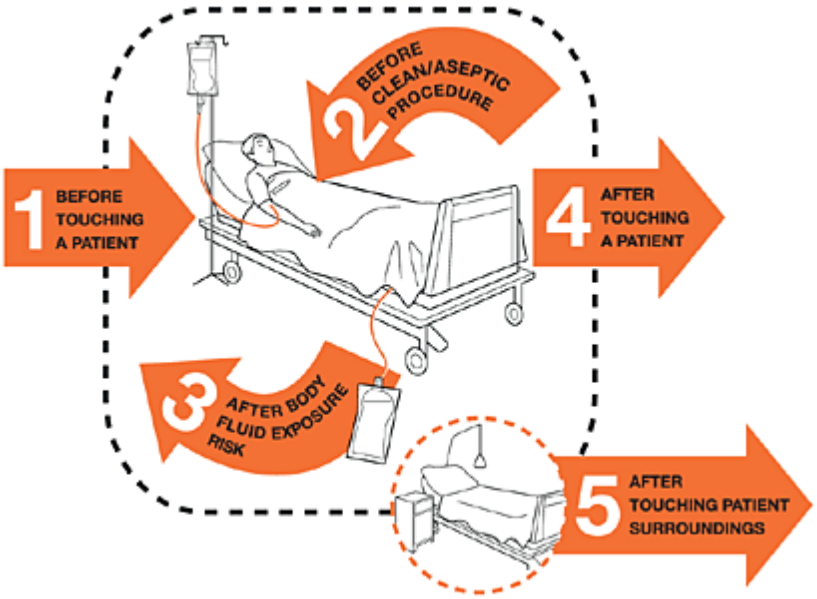


Figure (2.1) Five movements of hand hygiene

Source; WHO Guidelines on hand hygiene in health-care facilities (2009)

1. Perform hand hygiene before touching a patient.
2. Perform hand hygiene before a clean/ sterile procedure
3. Wash your hands with soap and water immediately after exposure risk to body fluids
4. Perform hand hygiene after touching a patient
5. Perform hand hygiene after touching any object or furniture in the patient's immediate surroundings

2.4 Personal protective equipment (PPE)

Personal protective equipment is a specialized equipment or clothing worn by health care providers to protect against infectious materials. PPE is a range of barriers such as gloves, masks, apron, gown, cap, goggles and shoe covers. PPE is used alone or in combination to protect mucous membranes, airways, skin and clothing from contact with infectious agents (Lemass et al., 2013). Hand hygiene should be done prior to putting gloves as well as immediately after removal of glove. The use of glove does not replace the need for hand hygiene.

2.5 Hospital waste management

Hospital waste are all waste generated by health care activities. Sources of waste are hospital environment, wards, OT, labor room, radiology, pathology, microbiology, nuclear medicine, blood bank and laboratories. Two types of hospital waste are Non –hazardous waste and hazardous waste. Non –hazardous waste comprises about 75% to 90% of hospital waste and the remaining 10% to 25% of waste is regarded as hazardous waste. Hazardous and clinical waste includes sharp waste, infectious waste, chemical waste, pharmaceutical waste, pathological waste, anatomical waste and radioactive waste. WHO color coding for waste containers are red for highly infectious waste, yellow for infectious and sharp waste, black for non-hazardous communal waste, green for anatomical waste and brown for chemical and pharmaceutical waste. Hospital waste is a potential for infective microorganisms and so requires appropriate handling, separation, transport, storage, disinfection and proper disposal of waste (MOHS, 2016), (WHO, 2002).

2.6 Environmental factors

The factors which should be considered for infection control in the planning of construction or renovation of hospital building includes traffic flow to minimize exposure of high risk patients, adequate spatial separation of patients, adequate number and type of isolation rooms, appropriate access to hand washing facilities, materials that can be cleaned easily and adequate ventilations. Water borne hospital acquired infections are usually due to failure to meet water quality standards for the specific use. Clean and healthy food is very important for prevention of food borne hospital acquired infections and outbreaks (WHO, 2002).

2.7 Studies related to hand hygiene

The studies done on the knowledge of healthcare providers with compliance to infection control precautions showed that although the majority of healthcare providers had good knowledge about infection control precautions, they had low practice in hand washing and using of gloves which were the most significant items to prevent transmission of infection (Salem, 2019), (Shrestha and Thapa, 2018), (Ayed, 2015), (Chisanga, 2017).

In addition to surveillance, healthcare worker education and reporting for hospital acquired infections, healthcare workers require accountability and behavioral change to simple and low cost infection control measures, such as proper hand washing and the correct application of basic precautions during invasive procedures (Naija, Jaidane and Boujaafar, 2013).

The promotion of hand hygiene with alcohol-based hand rub is successful for control of healthcare associated infection (Pittet et al., 2009). A cross-sectional study was conducted among healthcare providers in Hong Kong on perceptions of proper hand washing and impact of hospital acquired infections, they acknowledged that over 75% of hospital acquired infection can be prevented by proper hand washing (Tai et al., 2009).

A quasi-experimental study done among nurses in neonate ICU (Thailand) shows that compliance with hand hygiene among nursing personnel improved significantly and motivated after implementing a hand hygiene promotion program (Picheansathian, Pearson and Suchaxaya, 2008).

Most hospital acquired infections are spread by health care workers who do not follow proper hand washing and change gloves between patient contacts. Therefore, proper hand washing is very important activity to reduce hospital acquired infections (Naiikoba S, 2001;47:173-180).

2.8 Studies related to assessment of knowledge and attitude to compliance with infection control measures

Regarding knowledge of infection control precautions, healthcare providers had low levels of knowledge but high scores with positive attitudes for infection control precautions (Subih, Taher and Kalaldeh, 2017).

Some studies showed the same findings that compliance of nurses to standard precautions is still low (Efstathiou et al., 2011), (Gebresilassie, Kumei and Yemane, 2014),(Care et al., 2014), (Gawad, 2018).

Some studies found the same results that health care providers had inadequate training, poor knowledge and poor practices towards infection control precautions, (Njovu, 2016), (Atalla, Aboalizm and Shaban, 2016), (Mahmud and Abdul Sahib, 2011) (Fashafsheh, 2015) (Sodhi et al., 2013).

In spite of having low level of knowledge, there was high level of practice to infection control precautions among nurses in the Palestinian hospitals (Ayed et al., 2015).

Most of junior nurses at Bindura Provincial Hospital, Zimbabwe had poor knowledge of infection control measures. Factors influencing the compliance to infection control precautions were lack of knowledge, forgetfulness, inadequate time and limited resources (Tirivanhu, Ancia and Petronella, 2014).

Some studies done in Myanmar showed that most of the healthcare providers had high knowledge and positive attitude towards healthcare associated infections, but compliance with standard infection control precaution was inconsistent (Shwe, 2007). This finding was similar with (Thu, 2012) the study done at Yangon Orthopedic Hospital and (Khine, 2007) in 300 Beds Teaching Hospital, Mandalay.

A survey done in Birmingham teaching hospitals on knowledge and attitude of healthcare providers to compliance with infection control guidelines showed that overall knowledge about blood-borne virus transmission from an infected patient after needle stick injury was low (Stein, Makarawo and Ahmad, 2003).

2.9 Studies related to training on infection control precautions

Some of the studies showed that the training was not significantly associated with practice towards infection control precautions (Shrestha and Thapa, 2018), (Ayed, 2015), (Sa-Sa-Aung, Nursalam, 2016).

2.10 Studies related to professional characteristics and practice on infection control

The risk of exposure to blood and body fluids has been reduced by following the standard precaution measures (Parkin, 2012) (Garner, 1996) and (Siegel et al., 2019).

Although most of healthcare workers had adequate knowledge on infection control measures, other factors affecting compliance to infection control precautions were inadequate material and equipment, workload, shortage of staff and overcrowding of patients, lack of supervision and inadequate infection control committee meetings.(Njovu, 2016).

If healthcare workers had more experiences and more knowledge about healthcare associated infections, they were more likely to be compliance with standard infection control precautions (Kermode M, Jolley D, 2005;33(1):27–33.). The higher nurse to patient ratio increases the risk of hospital acquired infection and so the number of nursing staff should be adequate (Hugonnet, Chevrolet, & Pittet, 2007).

2.11 Conceptual Framework

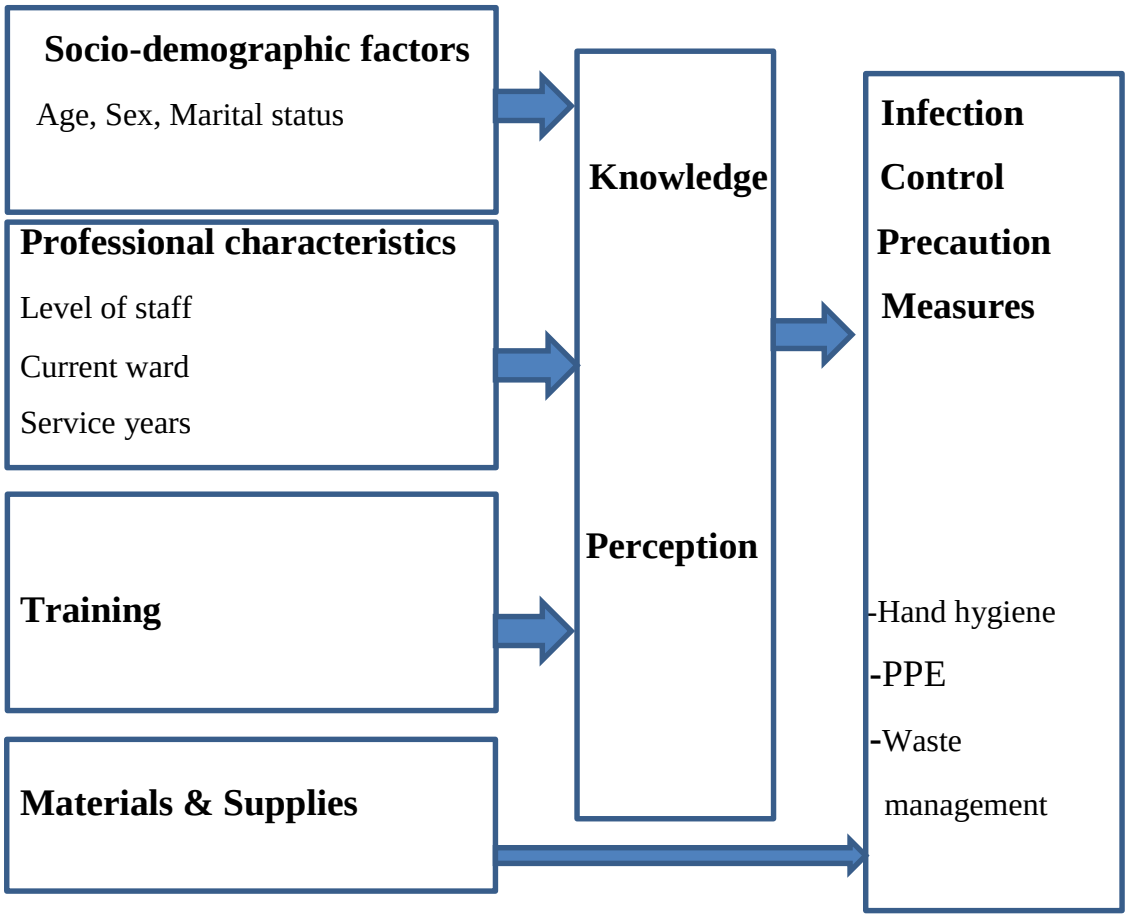


Figure (2.2) Conceptual model for determinants of compliance with infection control precautions

CHAPTER (3)

OBJECTIVES

3.1 General Objective

To assess the determinants of compliance with infection control precautions among nurses at Yangon Children Hospital

3.2 Specific Objectives

1. To access the proportion of nurses who strictly follow the infection control precautions (reported) in patient care at Yangon Children Hospital
2. To identify the determinants of compliance with infection control precautions among nurses at Yangon Children Hospital

3.3 Research questions

1. What is the proportion of nurses who reported strictly follow the infection control precautions in patient care at Yangon Children Hospital?
2. What are the determinants of compliance with infection control precautions among nurses at Yangon Children Hospital?

CHAPTER (4)

RESEARCH METHODOLOGY

4.1 Study Design

Hospital based cross sectional study

4.2 Study Period

August 2019 to November 2019

4.3 Study Area

(550) bedded Yangon Children Hospital

4.4 Study Population

Nurses working at Yangon Children Hospital

Inclusion criteria - All staff nurses and trained nurses who are working in all wards

Exclusion criteria - Nurses who were on all kinds of leave or off

4.5 Sample Size Determination

$n = z^2pq/d^2$ (Daniel & Cross, 2013) where,

n = sample size

d = margin of error 9% =0.09

p = proportion of nurses who have acceptable level of knowledge, perception and practice of infection control measure was assumed as 50%. (p = 0.5), (q=0.5)

sample size n was calculated as follow:

$n= z^2pq/d^2 = (1.96)^2* (0.5) * (0.5)/ (0.09)^2 = 118$

Non response 10% is added.

Minimal required sample size is **130.**

4.6 Sampling Procedure

Although minimum required sample size was 130 participants, all staff nurses and trained nurses at the time of study period were included in the study except those with exclusion criteria.

4.7 Data Collection Methods and Tools

Data collection was done by using self-administered structured questionnaire and observation checklist. After administration of the questionnaires, each and every statement was thoroughly explained to all respondents. These questionnaires were checked for completeness and consistency upon collection. Observation of infection control precautions at every units of Yangon Children Hospital was done by using checklist according to Hospital Infection Control Guideline (MOHS, Myanmar) and Infection Control Guideline (WHO). Pilot study was conducted at Yangon Specialist Hospital with five staff nurses and five trained nurses. During the pilot study, the questionnaires were pre-tested to identify the problems and to assess the required time to complete the answers.

4.8 Data Management and Analysis

Coding for some variables was done before data entry. Then data entry and checking was carried out by using EPI-data software after editing for consistency and completeness. Data analysis was done by using SPSS (Statistical Package for Social Sciences) Version 16.0. The cut off value between adequate and inadequate knowledge score was the mean knowledge score and participants who had mean score knowledge and above were regarded as adequate knowledge. Perception was assessed by five points likert scale scoring (5 points strongly agree to 1 point strongly disagree) for positive statements. Reverse direction (1 point for strongly agree and 5 points for strongly disagree) was applied to negative statements. For each individual, item average was calculated. Based on the item average, the perception of nurses towards the infection control precaution was calculated. The positive perception was taken as the average individual score of four and above. The cut off point for good practice was the mean practice score and the participants less than mean practice score were regarded as poor practice for infection control precaution. Descriptive analysis was done by frequency and percentage showing with tables and graphs. Factors influencing the compliance with infection control precaution was determined by using Chi square statistical test. If the assumption of Chi square test was not met, Fisher exact test was used. α was predefined at 0.05 and all statistical tests were considered as two sided.

4.9 Ethical Consideration

The study was conducted according to the guidelines issued by the University of public health Ethical clearance obtained from Institutional Review Board of the University of Public Health, Yangon, UPH-IRB (2019/ MHA/5).

During the study, rights of the nurses were respected. An informed consent containing information on purpose of the study benefits and risks was developed and given to the participants to read before consent was given to participate. Written consent was taken before data collection. Confidentiality was strictly maintained by privacy and anonymity of the respondent during data collection, analysis and reporting.

CHAPTER (5)

FINDINGS

5.1 Socio-demographic factors of nurses (n=160)

Table (5.1) Socio-demographic characteristics of nurses (n=160)

Demographic characteristics of respondents	Frequency	Percentage
Age		
20 – 30 years	116	72.5
31 – 40 years	28	17.5
41 – 47 years	16	10.0
Sex		
Male	1	0.6
Female	159	99.4
Marital Status		
Married	22	13.8
Unmarried	138	86.2

According to the table (5.1), the majority of nurses were ages between 20 to 30 years and representing 72.5% of the respondents followed by (31-40) years and (41-47) years. Almost all nurses at YCH were female nurses. Most of the respondents were unmarried and only about 14% of respondents at Yangon Children Hospital were married.

5.2 Professional characteristics of nurses (n=160)

Table (5.2) Professional characteristics of nurses (n=160)

Professional characteristics of respondents	Frequency	Percentage
Rank of staff		
SN	52	32.5
TN	108	67.5
Service years		
<5 years	99	61.9
5-<10 years	26	16.2
10-<15years	17	10.6
≥15 years	18	11.2
Training on infection control		
Training	109	68.1
No training	51	31.9
Last training (n=109)		
< 6 months	4	3.6
≥ 6 months	105	96.4

About two third of participants 67.5% were trained nurses. Among the respondents, 61.9% of respondents had service years of less than five years. About two third of nurses 68.1% had got the training on infection control precaution. Among the participants with training, 96.4% of nurses had got training on infection control precaution more than six months ago.

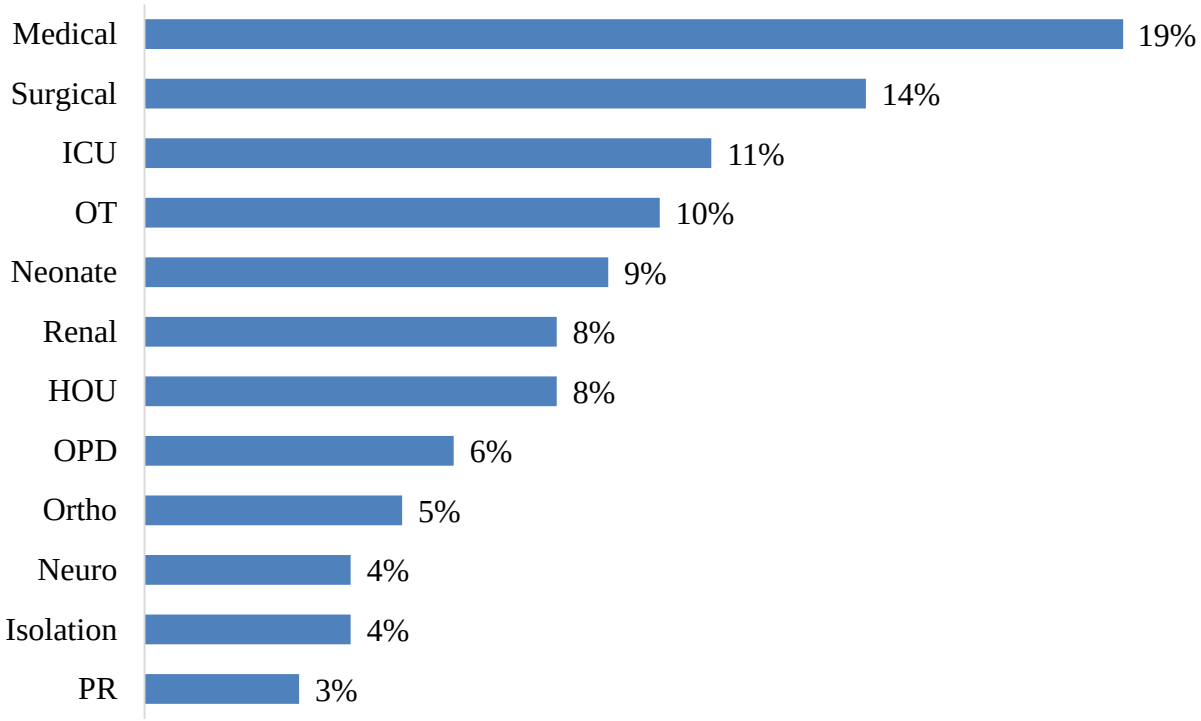


Figure (5.1) current wards of respondents

The current wards of participants were 19% from three medical wards, 14% from two surgical wards, 11% from Intensive Care Unit (ICU), 10% from Operation Theatre (OT) and 9% from neonatal wards.

5.3 Knowledge of nurses on infection control precaution (n=160)

Table (5.3) Knowledge on infection control precaution

Knowledge on infection control measure	Correct answer	
	Frequency	Percentage
Appropriate infection control measures can restrict the spread of infection from		
patients to health care workers	133	83.1
patients to other patients	139	86.9
patients to attendants	125	78.1
Health care associated infection which was present or incubation before admission.	141	88.1
Infections are transmitted by		
Air borne	97	60.6
Droplet borne	46	28.8
Contact	76	47.5
Types of infection control precautions.		
Standard precaution	22	13.8
Additional precaution	13	8.1
Standard precautions include		
Hand hygiene	154	96.2
Use of personal protective equipment	122	76.2
Appropriate handling of patient belongings, equipment and solid linen	121	75.6
Prevention of needle stick / sharp injuries	141	88.1
Appropriate handling of waste	137	85.6
Environmental cleaning and spills management	131	81.9
Hand hygiene include		
hand washing with soap and water	157	98.1
antisepsis	131	81.9
wearing glove	41	25.6
keeping the hand dry	56	35

Knowledge on infection control measure	Correct answer	
	Frequency	Percentage
PPE include		
Hair cover or cap	151	94.4
Eye wear or goggles	148	92.5
Mask	155	96.9
Gown	151	94.4
Apron	138	86.2
Gloves	155	96.9
Shoe covers	147	91.9
Disinfectant	47	29.4
Transportation process		
Patients care equipment should be prevented exposure to skin and mucous membranes and clothing.	109	68.1
Linen to ensure that there is no leaking of fluid.	148	92.5
Patient Placement process		
Place patient in a single room in droplet infection	95	59.4
Optimum spacing between beds is 3-6 feet	145	90.6
Air born infections are		
Active/open pulmonary TB	157	98.1
Measles	98	61.2
Influenza type B	12	7.5
Chicken pox	68	42.5
Meningitis	23	14.4
Hospital hazardous waste are		
Infectious wastes which contain pathogens	156	97.5
Laboratory wastes	144	90
Sharps	150	93.8
Cytotoxic drugs	139	86.9
Papers and materials used in office	139	86.9
Toxic laboratory chemicals	133	83.1
Used swabs, gloves, mask and other PPE	134	83.8
Expired drug	91	56.9

Knowledge on infection control measure	Correct answer	
	Frequency	Percentage
How do you manage sharps after using on the patient?		
The needle and syringe are disposed of immediately after use into a puncture resistant container	158	98.8
The needle is recapped before disposing of the needle and syringe	99	61.9
Syringe and needle are disposed of together with other waste into available waste containers	153	95.6
The needle is bent before disposing of the needle and syringe into a puncture resistant container	140	87.5
Hospital waste disposal method		
Autoclave	72	45
Land- fill	83	51.9
Microwave	65	40.6
Incineration	127	79.4
Deep burial in a secure area	142	88.8
Most common used disinfectants are		
70% alcohol	125	78.1
1% hypochlorite	54	33.8
Bleaching powder	142	88.8
Personal hygiene of nurses	146	91.2

Concerning with the spread of hospital acquired infections, 22% of respondents did not know the spread of infection from patient to attendants. Majority of nurses, 88% knew well about the meaning of health care associated infection. Most of the respondents had low knowledge on mode of transmission of HAI especially on droplet borne infection and only 28.8% of the respondents answered correctly.

Majority of respondents had poor knowledge on infection control precautions and they answered correctly only 13.8% for standard precaution and 8.1% for additional precaution. However, the respondents knew well about the contents of standard precaution and answered correctly more than 80% for hand hygiene, needle stick injury, waste handling and environmental cleaning. About one fourth of

respondents 23.8% did not know about the use of PPE and 24.4% of nurses did not answered correctly about appropriate handling of patient belongings, equipment and solid linen. The majority of nurses at YCH knew well about the contents of PPE but 70.6% of respondents did not know that the disinfectant was not included in PPE.

The knowledge on hand hygiene was high on hand washing with soap and water as well as antiseptics. However, the respondents answered correctly 35% on keeping the hand dry and only 25.6% on wearing glove. For the infection control precaution, 91.2% of respondents agreed personal hygiene of nurses, 90.6% of nurses agreed three to six feet for optimum spacing between beds and 59.4% of nurses for patient placement within a single room in droplet infection.

Regarding the most commonly used disinfectants for cleaning wards, respondents answered bleaching powder, 70% alcohol and 1% hypochlorite for 88.8%, 78.1% and 33.8% respectively. During transportation process, 32.9% of respondents did not know that patient care equipment should be prevent exposure to skin and mucous membranes, clothing and environment.

Concerning with knowledge on hospital hazardous waste, most of the respondents had high knowledge with infectious waste, laboratory waste, sharp waste, cytotoxic drugs, used PPE but 43% doubted on expired drugs. The knowledge of nurses on the management of sharps after using was high but 38% of respondents believed that the needle was recapped before disposal of needle and syringes. There was high knowledge of respondents on hospital waste disposal method for incineration and deep burial in a secure area but low knowledge for autoclave, land-fill and microwave accounting for 45%, 52% and 40% respectively.

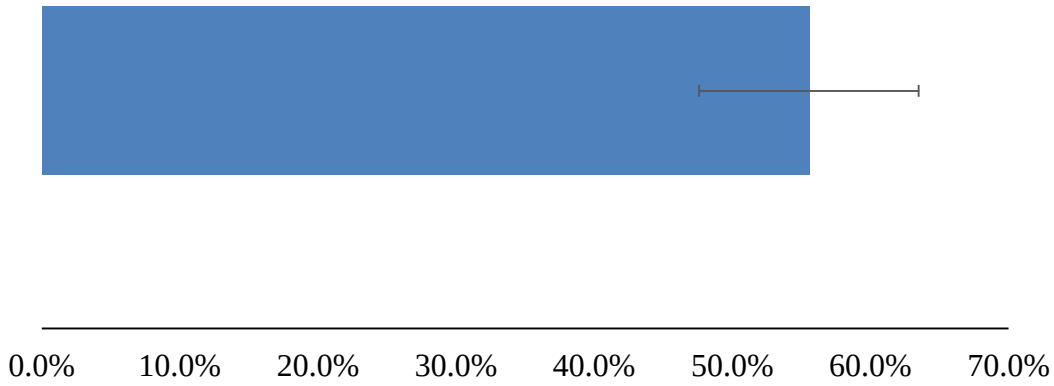
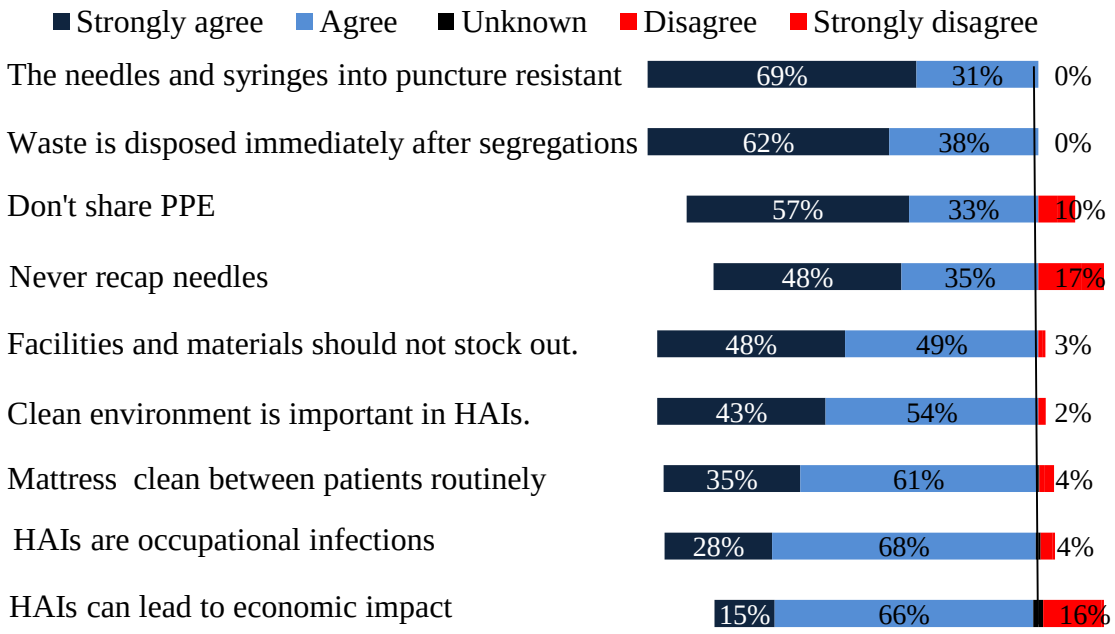


Figure (5.2) Knowledge level of nurses on infection control precaution

About half of the nurses 55.6% (95% CI: 47.6%, 63.5%) at YCH had adequate knowledge on infection control precautions.

5.4 Perception towards infection control (n=160)

Positive statements for perception towards infection control precautions



Negative statements for perception towards infection control precautions

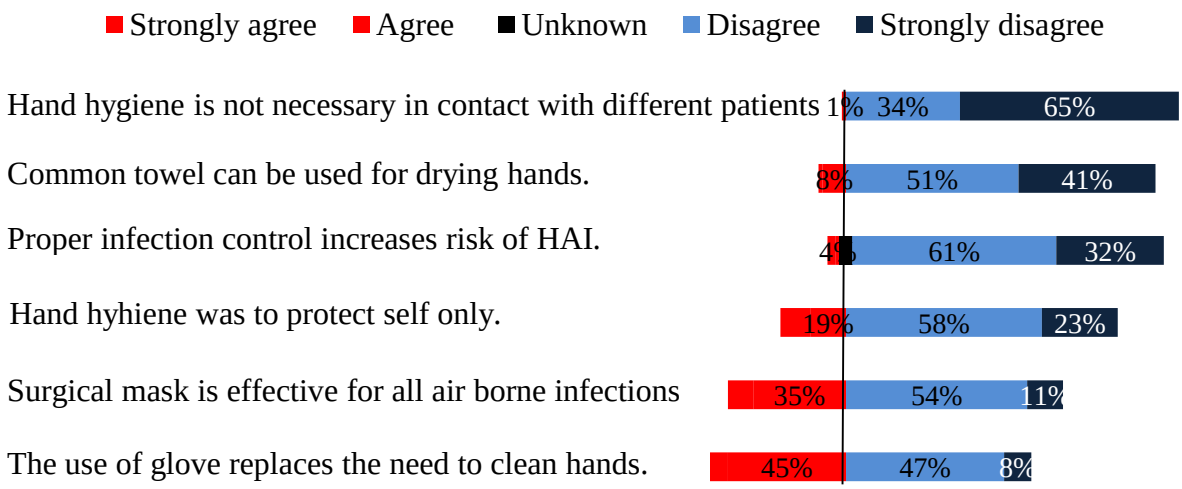


Figure (5.3) Perception of nurses towards infection control precautions (n= 160)

Among the positive statements for infection control precautions, all the nurses agreed or strongly agreed to the statements that waste was disposed into available containers after segregating and that the needle and syringe were disposed immediately after use into a puncture resistant container. Some of the nurses 16.8% disagreed to the statement ‘never recapped or bent the needles’ and 15.6% of nurses disagreed to the statements that ‘HCAI could lead to economic impact on patient and health care system’

For the negative statements towards infection control precautions, 45% of nurses agreed that the use of gloves does replace the need to clean your hands and 35% agreed that surgical mask was effective for all air borne infections. Some of respondents 19% agreed to the statement that you must perform hand hygiene to protect themselves.

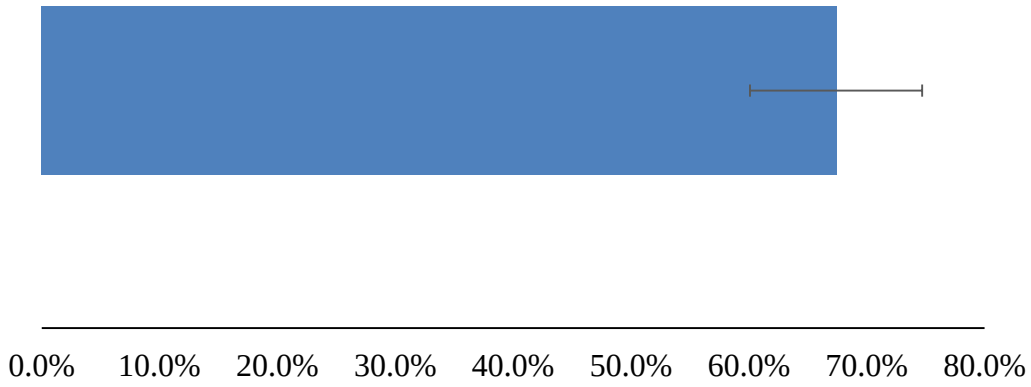


Figure (5.4) Perception level of nurses towards infection control precaution

About two third of the nurses 67.5% (95% CI: 60.1%, 74.7%) at YCH had positive perception towards infection control precautions.

5.5 Practice towards infection control precautions (n=160)

Table (5.4) Practice of nurses towards infection control precautions

Practice on infection control measure	Correct answer	
	Frequency	Percentage
Standard or routine precautions to be followed for all patients and additional precautions for selected patients.	126	78.8
How often do you perform hand hygiene when delivering nursing care?		
Before and after contact with each patient	158	98.8
Before and after performing any procedure between patients or on the same patient	155	96.9
Before putting on gloves and after removing gloves	142	88.8
After handling contaminated objects/ materials	143	89.4
How do you clean your hand?		
Soap and water	157	98.1
Water	62	38.8
Alcohol swabs	91	56.9
Antiseptic hand wash	144	90
Antiseptic hand gel	144	90
What parts are exposed with soap and water during hand washing after patient examination?	90	56.2
Adequate hands washing time with water and soap	89	55.6
Alcohol based hand rubbing time	79	49.4
The use of PPE where contact with patient's blood, body fluid, excretion and secretions	68	42.5
The use of N-95 in care of MDR-TB patients	123	76.2
The use of N-95 in air- born infection	97	60.6
The change of gloves between contacts with different patients	150	93.8
The first remove of glove when removing personal protective equipment?	100	62.5

Practice on infection control measure	Correct answer	
	Frequency	Percentage
The use of disposable gowns in an infected case care	154	96.2
The use goggles/eye protection when doing procedures that are likely to generate risk		
Always	70	43.8
Sometimes	68	42.5
Rarely	14	8.8
Not use	8	5
According to WHO color coding waste management, container color		
Yellow for sharp waste	66	41.2
Red for infectious waste	12	7.5
Green for highly infection waste	41	25.6
Black for garbage	139	86.9
Hospital floor should be clean twice in each shift and more often if needed with detergent and water.	152	95

Regarding with practice towards infection control precaution, 78.8% of nurses followed standard or routine precautions to all patients and additional precautions to selected patients.

During nursing care, the reported results of nurses on hand hygiene were about 90%. More than 90% of nurses cleaned the hands with antiseptic hand wash, antiseptic hand gel, soap and water. Most of nurses 56.9% used alcohol swab for hand hygiene and only 38.8% of nurses used water alone. After patient examination 56.2% of respondents exposed hand and wrist parts with soap and water during hand washing. More than half of nurses 55.6% took hand washing time to 40-60 seconds with soap and water and 49.4% of nurses took 20-30 seconds with alcohol based hand washing.

The use of PPE in contact with patient's blood, body fluid, excretion and secretions was done by 42.5% of nurses. N-95 mask was used 76.2% in MDR-TB patients and 60.6% in air borne infection. Majority of nurses 93.8% changed gloves between contact with different patients. Most of nurses 62.5% removed the glove

firstly when removing PPE. During the care of infected cases disposable gowns were used by 96.2% of nurses. When doing procedures that were likely to generate risk, goggles were used always 43.8%, sometimes 42.5%, rarely 8.8% and not use at all by 5%.

Regarding with the results on hospital waste management according to WHO color coding, 41.2% correct yellow for sharp waste, 92.5% incorrect red for infectious waste, 74.4% incorrect green for highly infectious waste and 86.9% correct black for garbage. Among the participants, 95% of nurses answered that they practiced the cleaning of hospital floor twice in each shift and more often if needed with detergent and water.

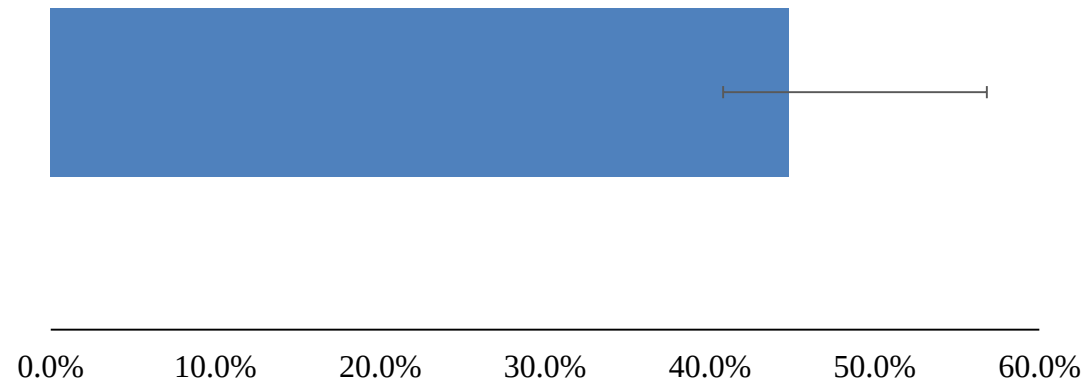


Figure (5.5) Practice level of nurses towards infection control precautions

. The proportion of respondents who reported compliance with infection control precautions in patient care was 48.8% (95% CI: 40.8%, 56.8%) of nurses at YCH.

Table (5.5) Association between socio-demographic factors and knowledge score group (n=160)

Demographic characteristics	Knowledge score		Chi square	*P* value
	Adequate	Inadequate		
Age			3.442	0.179
20 - 30 years	60 (51.7)	56 (48.3)		
31 - 40 years	17 (60.7)	11 (39.3)		
41 - 47 years	12 (75.0)	4 (25.0)		
Marital status			0.663	0.451
Married	14 (63.6)	8 (36.4)		
Unmarried	75 (54.3)	63 (45.7)		

As shown in table (5.5) there was no significant association between socio-demographic factors and knowledge on infection control among nurses.

Table (5.6) Association between professional characteristics and knowledge score group (n=160)

Professional characteristics	Knowledge score		Chi square	*P* value
	Adequate	Inadequate		
Rank of staff			5.777	**0.016**
SN	36 (69.2)	16 (30.8)		
TN	53 (49.1)	55 (50.9)		
Service years			5.479	0.14
<5 years	48 (48.5)	51 (51.5)		
5-<10 years	17 (65.4)	9 (34.6)		
10-<15 years	12 (70.6)	5 (29.4)		
≥15 years	12 (66.7)	6 (33.3)		
Training on infection control			0.654	0.419
Training	63 (57.8)	46 (42.2)		
No training	26 (51.0)	25 (49.0)		
Last training (n=109)				0.136*
< 6 month	4 (100)	00 (00.0)		
≥ 6 months	59 (56.2)	46 (43.8)		

*Fisher exact P value

According to table (5.6), staff nurses had statistically significant adequate knowledge on infection control precautions than trained nurses (69% Vs 49%, P=0.016).

Table (5.7) Association between socio demographic factors and perception score group (n=160)

Demographic characteristics	Perception score		Chi square	*P* value
	Positive	Negative		
Age			5.754	0.056
20 – 30 years	74 (63.8)	42 (36.2)		
31 – 40 years	19 (67.9)	9 (32.1)		
41 – 47 years	15 (93.9)	1 (6.1)		
Marital status			0.005	0.941
Married	15 (68.2)	7 (31.8)		
Unmarried	93 (67.4)	45 (32.6)		

Table (5.6) showed that there was no statistically significantly association between socio-demographic characteristics and perception towards infection control precautions of nurses.

Table (5.8) Association between professional characteristics and perception score group (n=160)

Professional characteristics	Perception score		Chi square	*P* value
	Positive	Negative		
Rank of staff			4.521	**0.033**
SN	41 (78.8)	11 (21.2)		
TN	67 (62.0)	41 (38.0)		
Service years			5.759	0.124
<5 years	61 (61.6)	38 (38.4)		
5-<10 years	19 (73.1)	7 (26.9)		
10-<15 years	12 (70.6)	5 (29.4)		
≥15 years	16 (88.9)	2 (11.1)		
Training on infection control			5.416	**0.02**
Training	80 (73.4)	29 (26.6)		
No training	28 (54.9)	23 (45.1)		
Last training (n=109)				1.0*
<6 month	2 (50.0)	2 (50.0)		
≥ 6 months	62 (59.0)	43 (41.0)		

*Fisher exact P value

Staff nurses had significantly higher perception scores than trained nurses (P=0.033). Participants with training had statistically significant higher perception scores than those without training (P=0.02). Table (5.8)

Table (5.9) Association between socio-demographic factors and practice score group (n=160)

Demographic characteristics	Practice score		Chi square	*P* value
	Good	Poor		
Age			3.034	0.219
20-30 years	61 (52.6)	55 (47.4)		
31-40 years	12 (42.9)	16 (57.1)		
41-47 years	5 (31.2)	11 (68.8)		
Marital status			0.111	0.739
married	10 (45.5)	12 (54.5)		
unmarried	68 (49.3)	70 (50.7)		

Table (5.9) showed that there was no significant association between socio-demographic factors and practice on infection control precautions.

Table (5.10) Association between professional characteristics and practice score group (n=160)

Professional characteristics	Practice score		Chi square	*P* value
	Good	Poor		
Rank of staff			6.16	**0.013**
SN	18 (34.6)	34 (65.4)		
TN	60 (55.6)	48 (44.4)		
Service years			4.483	0.214
<5 years	53 (53.5)	46 (46.5)		
5-<10 years	13 (50.0)	13 (50.0)		
10-15 years	7 (41.4)	10 (58.8)		
>15 years	5 (27.8)	13 (72.2)		
Training on infection control			1.134	0.287
Training	50 (43.9)	59 (54.1)		
No training	28 (54.9)	23 (45.1)		
Last training (n=109)				0.331*
< 6 month	3 (75.0)	1 (25.0)		
≥ 6 months	47 (44.8)	58 (55.2)		

*Fisher exact P value

Trained nurses had statistically significantly higher practice scores towards infection control precaution than staff nurses (P=0.013). Table (5.10)

Table (5.11) Association between knowledge score group and practice score group (n=160)

	Practice score group		Chi square	*P* value
	Good	Poor		
Adequate knowledge	48 (53.9)	41 (46.1)	2.156	0.142
Inadequate knowledge	30 (42.3)	41 (57.7)		

There was no significant association between knowledge score and practice score towards infection control precautions. Table (5.11)

Table (5.12) Association between perception score group and practice score group (n=160)

	Practice score group			
	Good	Poor	Chi square	*P* value
Positive perception	55 (50.9)	53 (49.1)	0.630	0.427
Negative perception	23 (44.2)	29 (55.8)		

According to table (5.12), the association between perception score group and practice score group of infection control precaution was not statistically significant.

Table (5.13) Materials and Supplies for Infection Control Precaution Activities (n=159)

Resources	Adequate supply	Inadequate supply	No supply
Alcohol swabs	150 (94.3)	9 (5.6)	-
Surgical Mask	149 (93.7)	10 (6.3)	-
Disinfectants	142 (89.3)	16 (10.0)	1 (0.6)
Dust bin	141 (88.7)	14 (8.8)	4 (2.5)
Cap	138 (86.8)	19 (11.9)	2 (1.2)
Glove	137 (86.2)	22 (13.8)	-
Safety box*	124 (77.9)	31 (19.6)	3 (1.9)
Apron*	119 (74.4)	27 (16.9)	11 (6.9)
Soap*	112 (70.0)	45 (28.1)	1 (0.6)
Antiseptic Hand gel	110 (68.8)	45 (28.1)	4 (2.5)
Gown*	88 (56.0)	57 (36.3)	12 (7.56)
N 95 Mask*	45 (28.8)	94 (60.2)	17 (10.9)
Boot*	33 (21.2)	91 (58.3)	32 (20.5)
Goggle*	29 (18.6)	97 (62.2)	30 (19.2)

*Missing value present

The reported inadequate supply of resources for infection control precautions were goggles 60.6%, N 95 mask 58.8%, boots 56.9%, gowns 35.6%, antiseptic hand gel 28.1%, soap 28.1%, safety box 19.6%, glove 13.8% and cap 11.9%.

During observation in the wards, soap, alcohol swabs, dust bins, cap, mask and gloves were present nearly all the wards. N 95 masks were stored by ward sister and issued for health care providers when it was necessary. Antiseptic hand gel was absent in most of the wards.

5.6 Observation with checklists in the wards of YCH

The observation with checklists was done in medical unit 1, medical unit 2, medical unit 3, surgical unit 1, surgical unit 2, medical ICU, surgical ICU, neonatal unit, HOU, renal unit, orthopedic unit, neurological unit OPD and emergency departments.

5.6.1 Hand hygiene

During the observation with checklist, all units of YCH had easily accessible washbasins with running water, soap, hand washing reminders and posters. The hand gel boxes were empty with hand gel in most of the wards. Only a minority of units used separate towels and papers for drying. For drying without contamination, the hand driers were set up near all basins but healthcare workers did not used due to the reasons of time consuming, some were not functioning and more spread of infection. Although there were paper boxes, most of them were lack of paper and they used common towel. During the observation of hand washing of two trained nurses, they did not washed hands thoroughly taking enough time, not following hand washing steps and used common towel for drying.

5.6.2 Personal protective equipment

At the time of examination, surgical mask and gloves were easily available in all wards and N95 mask were stored by ward sisters to be supplied if necessary. Some of the nurses did not worn gloves during the intravenous cannula insertion and blood sample collection due to loss of sensation onto the veins. One of the trained nurses disposed the blood stained cotton without wearing the glove. One of the trained nurses cleaned the spills of blood on the floor with alcohol swabs and disposed them into red container by wearing gloves.

5.6.3 Waste management

Disposable syringes and needles were used at all the units of YCH. There were adequate waste bins and puncture proof safety boxes but it was said that plastic bags for waste disposal were not supplied adequately. The sterilized materials and instruments were placed in separated place. The syringes and needles were disposed into puncture proof safety boxes. On examination of waste bins, most of the units did not disposed hospital wastes according to WHO color coding. Syringes and gloves were mixed in general waste in some wards.

5.6.4 Environmental condition

During observation into wards, almost all the patient wards were overcrowded and not enough space between the patient beds for infection control. It was said that the floors, trolleys, medical equipment and machines were cleaned daily with antiseptic solutions. Nearly all units had separate dressing room and the equipment and trolleys were said to be cleaned daily. The used linens from all units were transferred to washing department where washing machine was present.

5.7 Limitations of the study

The limitation of this study was that the observation on the practice of infection control precaution for all nurses could not be done. The observation in the wards and the infection control practice of nurses who were present in the wards at the time of observation was done with checklist.

CHAPTER (6)
DISCUSSION

In this study, about half of the respondents had adequate knowledge and good practice on infection control precautions (ICPs). Two third of the respondents had positive perception towards infection control. Training on infection control precaution had been given to two third of the respondents more than last six months ago. Staff nurses had significantly higher knowledge score and perception score than trained nurses. However, trained nurses had significantly higher practice score towards infection control precautions than staff nurses. The participants who had received training on infection control precaution had significantly higher perception score than those without training.

6.1 knowledge on infection control precautions

In this study, about half of the respondents had adequate knowledge score. This finding was supported by the study done in Nepal (Shrestha and Thapa, 2018). Contrary, the overall knowledge was high in most of the respondents at Waibagi Special Hospital (SWH) and Palestine study. In Nigeria study (Abu Bakar, *et al,* 2015) nearly one third of participants had good knowledge. SWH was a hospital in which infectious patients were admitted and was different in hospital setting from Yangon Children Hospital. There were differences in questionnaire and cut off point for adequate knowledge in Palestine and Nigeria studies.

Concerning with the knowledge on control of hospital acquired infection by restriction of the spread of infection, 21.9% of nurses did not know the spread of infection from patient to attendants. In the study done at Bago General Hospital (BGH), only 5% of nurses did not know from patient to attendants and it was different from this study. There was inadequate knowledge about mode of transmission on hospital acquired infections about half of respondents by air-borne and two third of respondents by droplet-borne infection. The knowledge on standard and additional precaution was very poor (less than 15%) of nurses knew standard precaution and on additional precaution. Similar findings were also found in BGH study. In this study, majority of nurses knew the optimum spacing between beds and higher than BGH study in which about two third of nurses knew this knowledge.

The findings on high knowledge of nurses on hand hygiene by hand washing was the same with Nepal study. In this study, there was low knowledge of hand hygiene and the respondents answered correctly about one fourth by wearing gloves and one third of respondents by keeping the hand dry as hand hygiene. In BGH study, it was found that about half of respondents by wearing gloves and keeping the hand dry.

Nearly all the nurses knew the components of PPE equipment but two third of nurses had confused the disinfectant as PPE. This finding was different in BGH study where half of the respondents had.

In this study only a few of respondents falsely assumed office waste as hazardous waste and it was different in BGH study where majority of nurses had false concept. In this study, the knowledge of nurses on hospital waste disposal method was higher than BGH study in microwave, autoclave and land fill and lower in incineration and deep burial in a secure area.

In this study most of nurses had high knowledge on prevention of needle stick injury and (38.9%) of nurses still recapped the needles before disposal. In the study of BGH, (23.6%) of nurses recapped the needle before disposal. This might be due to difference in hospital setting as YCH was a children hospital, nearly all the child patients were given injections through intravenous cannula and needles were not used.

6.2 Perception towards infection control precautions

In this study, two third of the participants at YCH had positive perception for infection control precaution. The similar result for positive perception towards infection control precautions was observed in Jordan study (Subih, Taher and Kalaldeh, 2017). This finding was consistent with previous studies which reported the same proportion of positive perception such as a study in Myanmar at SWH, at BGH and Italy study (Nobile et al, 2009), and Zambia study (Maukwato et al, 2009). This indicates that the majority of nurses at YCH perceived the importance of adherence to ICPs.

Most of the of nurses had positive sense of perception on the statement that healthcare associated infections can lead to economic impact and this finding was different from the study at BGH where only one third had positive perception. This might be due to the difference in hospital setting.

6.3 Practice on infection control precautions

In this study, about half of nurses had good practice for infection control precaution. There was similar finding in Nepal study (Shrestha and Thapa, 2018).

In contrast to this finding, most of participants at SWH had the overall compliance on standard precautions and in Palestine study, the majority of the studied sample had good infection control practices level. This finding might be due to the different in hospital setting and measurement tools.

In this study, the practice of nurses on waste management was reported to be poor. According to WHO color coding, the practice on disposal of waste into yellow, red and green containers were very poor (less than 45%). The disposal of waste into black container was good (more than 80%). This finding was consistent with results in BGH study. This might be due to the fact that the participants falsely disposed infectious waste into red containers instead of disposed into yellow container.

There was a difference color coding for green containers between WHO color coding and hospital infection control guidelines, MOHS. In WHO color coding, green container was used for anatomical waste and in MOHS guidelines, green was used for dry communal waste. In this study, the negative statement was asked to nurses that green container was used for highly infectious waste. In both WHO and MOHS guidelines, highly infectious waste was disposed into red container. Therefore, the difference in coding for green color did not affect the practice score of the participants in this study.

During hand washing, only about half of the nurses followed hand washing steps and took correct duration of hand washing time with soap and water as well as alcohol based hand rubbing. This finding was supported by observation in the wards where two of the trained nurses did not take enough time for hand washing and did not follow hand washing steps. Similar results were found in BGH study and these practices needed to be changed. The reported results of hand hygiene practice on five movements were good. This finding was similar to the results of the study done at SWH in 2016 showed that all participants had good practice for hand hygiene.

In this study, it was found that (less than 45%) of nurses used PPE in contact with patient's blood, body fluid, excretion and secretions as well as the usage of goggles in risky procedures. This finding was confirmed by observation in the wards where some nurses did not use gloves during intravenous cannula insertion and

disposal of blood stained cotton without wearing gloves. These practices needed to be changed in prevention and control of hospital acquired infections.

The supply of materials and resources for infection control measures were not adequate especially hand gels and disposable tissue papers or hand towers for drying. Most of the patient wards were crowded and patient beds were much closed to each other which were not within the standard distant for infection control measures.

6.4 Association between knowledge of infection control precautions and its related factors

In this study, there was no statistically significant association between knowledge of infection control and socio-demographic characteristics such as age, sex and marital status. and this finding was consistent with the study on knowledge and practice of nursing staff towards infection control measures in the Palestinian Hospitals (Fashafsheh, 2015). The same results of associations were observed in Myanmar studies done at SWH and BGH.

According to the rank of participant, staff nurses had significantly adequate knowledge on infection control precaution than trained nurses. No significant associations were found in SWH, BGH and Palestine studies. This finding might be due to more clinical experience and knowledge of staff nurses than trained nurses.

The nurses with service (<5 years) group had lowest percentage of adequate knowledge score than any other group. The association between service year and knowledge was not statistically significant. Similar result was found in Myanmar studies done at SWH, BGH as well as Nepal and Palestine studies.

The nurses with infection control training had more adequate knowledge score than those without training. However, there was no significant association between the knowledge and the training on infection control precaution and the same results were found in Palestinian study and Myanmar study in SWH (Sa-Sa-Aung, Nursalam, 2016).

6.5 Association between perception towards infection control precautions and its related factors

According to the rank of respondents, staff nurses had significantly higher positive perception than trained nurses. The nurses who got training on infection control precaution at YCH were significantly higher positive perception scores than those without training. Nurses seemed to perceive positive sense towards infection control after they had received training.

In this study, the reasons for significant associations with positive perception might be due to the facts that staff nurses had more clinical experience than trained nurses as well as more training including on the job trainings. Therefore, staff nurse and training had seen to be the same on higher positive perception scores than trained nurses and participants without training.

6.6 Association between practice towards infection control precaution and its related factors

The nurses within the age group of (20-30) years had highest percentage of good practice score and those within the age group of (40-47) years had lowest percentage. Unmarried group had higher percentage of good practice than married group. However, this study showed that there is no significant association between practice on infection control and socio-demographic characteristic of respondent such as age, sex and marital status. This finding was similar with findings in Myanmar studies done at SWH and BGH as well as in Palestine study.

In this study, the trained nurses had higher practice scores than the staff nurses and the association between rank of staff and the practice of infection control precaution was statistically significant. The reason for this association might be due to difference in nature of work, trained nurses had more exposed to infection control activities and most of the staff nurses were seemed to be busy with clerical and administrative works.

In the association between service year and practice, the percentage of good practice on infection control precaution was decreasing with the increase in service year. However, the association between service year and practice on infection control precaution was not statistically significant. This finding was consistent with the findings in Nepal study, Palestine study, BGH study and SWH study.

There was no significant association between the training on infection control precautions and the practice of nurses. Similar findings were found in Myanmar studies at BGH and SWH as well as in Nepal study.

6.7 Association between knowledge and practice of infection control precaution

In this study, the knowledge level was not significantly associated with practice level and the same results were found in Myanmar studies done in SWH (Sa-Sa-Aung, Nursalam, 2016) and BGH (May-Thu-Zaw, 2016). Similar results were also found in Saudi Arabia study (Salem, 2019) on knowledge and practices of nurses in

infection prevention and control within a tertiary care hospital and in Nepal study (Shrestha and Thapa, 2018).

6.8 Association between perception and practice of infection control precaution

In this study, the association between perception and practice of infection control precaution was not significant. Although staff nurses had significantly higher positive perception than trained nurses, they were significantly poor in following the infection control precaution practices than trained nurses. In the findings of this study, one important thing was that although staff nurses had significantly higher knowledge and perception scores than trained nurses, they seemed to be reluctant to follow the infection control guidelines.

CHAPTER (7)

CONCLUSION

The findings of this study showed that only half had adequate knowledge, two third had positive perception and only half of the nurses strictly followed the infection control precautions (reported) in patient care. Most of the nurses had good practice in standard precautions and hand hygiene but used common towels for drying. There was poor practice in the use of PPE especially in contact with patient's blood, body fluid, excretions, secretions and goggle use in risky procedures. According to WHO color coding, the reported practice of nurses was poor in hospital waste disposal into yellow, red and green containers. The trained nurses had higher practice scores towards infection control precautions than staff nurses.

CHAPTER (8)

RECOMMENDATIONS

- Supervision and monitoring on infection control practice should be done regularly by infection control committee followed by giving feedback to nurses.
- Periodic trainings on infection control precautions should be provided in order to keep the health care providers including newly employed nurses of updating knowledge and compliance.
- All facilities and resources required for applying infection control precautions should be supplied adequately.
- Infection control nurses should be assigned in each wards for close supervision on the practice of nurses towards infection control precautions.
- The surveillance system should be established to assess the burden of hospital acquired infections at Yangon Children Hospital.
- Further studies on compliance with infection control precautions among other health care professionals using mixed method should be conducted to assist in planning on infection control precautions.

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ANNEXES

Annex (1) Variables and operational definitions

No	Variable	Operational definition	Scale of measurement
1.	Age	Age at last birthday (completed years of age)	Ratio
2.	Sex	Biological difference between male or female characteristics	Nominal
3.	Knowledge	Understanding of nurses on the infection control precautions	Nominal
4.	Knowledge score	Adequate knowledge score is mean knowledge score and above and below that level is inadequate knowledge score.	Categorical
5	Perception	Attitude of nurses towards prevention of hospital acquired infections with proper infection control precautions	Normal
6.	Perception score	Positive perception score is average perception score of four and above and below that level is negative perception score.	Categorical
7.	Practice	Practice of nurses towards infection control precautions	Nominal
8.	Practice score	Good practice score is the mean practice score and above and below that level is poor perception score.	Categorical
9.	Hand hygiene	Hand washing and use of antiseptics	Nominal
10.	Hand washing	Washing limited to hands and wrists for a minimum of 40-60 seconds with soap and water	Nominal
11.	Hand antisepsis	Removes or destroys transient micro-organisms and confers a prolong effect by using antimicrobial soap and water or waterless alcohol based hand gel/hand rub	Nominal
12	Hospital acquired infection	An infection occurring in a patient in a hospital in whom the infection was not present or incubating at the time of admission and acquired during health care services but appearing after discharge and also occupational infection among the staff of the facility"	Nominal
13.	Personal protective equipment	Protective barriers to reduce the risk of contaminating hands, eyes, clothing, hair and shoes(e.g. gloves, goggles, mask, apron, gown, shoe covers and cap)	Nominal

14.	Infectious materials	Contain pathogens in sufficient concentration that exposure to it could cause disease	Nominal
15.	Health care waste	Unique form of solid and liquid waste generated during health care services	Nominal
16.	Standard precaution	Applied for all patients at all times regardless of their known or presumed infectious status	Nominal
17.	Airborne precaution	Additional to standard precautions and are designed to reduce the transmission of diseases spread by the airborne route	Nominal
18.	Droplet precaution	Additional to standard precautions and are designed to reduce the transmission of diseases spread by the droplet route	Nominal
19.	Contact precaution	Additional to standard precautions and are designed to reduce the transmission of micro-organisms by direct or indirect contact	Nominal
20.	N 95 mask	The mask that protects health care providers from inhaling respiratory pathogens that are transmitted via the airborne route such as MDR -TB	Nominal
21.	Reusable surgical mask	The cotton mask which is washed or disinfected appropriately after utilization and before being used in another procedure	Nominal
22.	Sharps	Any items that could cause a cut or puncture such as syringes, needles scalpels and blades	Nominal
23.	Needle recapping	Recaps the used needles before discard	Nominal
24.	Color coding	Designates the use of different colors for storage of various categories of hospital wastes	Nominal

Annex (2) Informed consent form

Institutional Review Board

University of Public Health, Yangon

Name of Investigator – Dr Toe Maung

a) Title of research - "Determinants of compliance to infection control precaution among nurses in Yangon Children Hospital"

Part (A) Informed consent form for self-administered questionnaires

1. Introduction

I am Dr Toe Maung, Student of Master of Hospital Administration at University of Public Health, Yangon. I am doing research on "Determinants of compliance to infection control precaution among nurses in Yangon Children Hospital"

2. Purpose of the research

This study is to assess "Determinants of compliance to infection control precaution among nurses in Yangon Children Hospital".

3. Type of Research Intervention

This research will involve your participation in self-administered questionnaires about forty minutes.

4. Participant Selection

You are being invited to take part in this research because we feel that you will interest in "Determinants of compliance to infection control precaution among nurses in Yangon Children Hospital".

5. Voluntary Participation

Your participation in this research is entirely voluntary. It is your choice whether participate or not.

6. Procedure

I would like to invite you to take part in this research project. If you accept, you have to answer in self-administered questionnaires about forty minutes. It will be taken at a place which is comfortable for you. The questionnaires will include information about your socio-demographic factors, knowledge, perception and practice on infection control precautions**.** You do not have to answer any question or take part in the discussion if you feel the issue(s) are too personal or if talking about them makes you uncomfortable.

7. Benefits

Participation in this study will not benefit the participant directly but your participation is likely to help us find out more about how to solve the problem of infection control precaution for hospital acquired infection.

8. Confidentiality

I will not be sharing information about your participation in this study to anyone outside. The information that I collect from this research project will be kept private.

9. Sharing the Results

The knowledge that I get from research will be only to the persons who have the responsibility for this study. I will then publish the results to be read only by the interested people.

10. Who to contact

If there are any queries before, during and after the study you can directly contact the investigator Dr Toe Maung, Phone – 09451229898 or via email drtoemaungmdy@ gmail.com. This proposal had been reviewed and approved by the Institutional Review Board, University of Public Health, Yangon, which is a committee whose task is to make sure that research participants are protected from harm. If you wish to find out more about the committee, contact the secretary of the committee at University of Public Health, Yangon, No. 246, Myoma Kyaung Street, Latha Township, Yangon, 11311. Office phone +95 1395213, +95 1395214 ext:23/25.

Part (B) Consent form

I have been invited to participate in research about "Determinants of compliance to infection control precaution among nurses in Yangon Children Hospital". I know that I will have to answer the self-administered questionnaires about forty minutes. I am aware that there may be no benefit to me personally. The questionnaires include socio demographic characteristics, knowledge, perception and practice on infection control precautions**.** I have read the foregoing information, or it has been read to me. I have had the opportunity to ask questions about it and any questions I have been asked to my satisfaction. I consent voluntarily to be a participant in this study.

Name of participant ----------

Signature of participant ----------

Date ----------

သုတေသန လုပ်ငန်းတွင် ပါဝင်ဆောင်ရွက်ရန် သဘောတူညီချက်တောင်းခံခြင်း

ဤသဘောတူညီချက်မှာ ရန်ကုန်ကလေးဆေးရုံကြီးမှ သူနာပြုဆရာ ၊ ဆရာမများ၌ ကူးစက် ရောဂါ တားဆီးနှိမ်နှင်းရေးနှင့် စပ်လျဉ်း၍ သူနာပြုဆရာ၊ ဆရာမများ၏ ဗဟုသုတ၊ ခံယူချက်၊ သဘော ထားနှင့် လက်တွေ့လုပ်ဆောင်မှုကို သုတေသနပြုလုပ်ခြင်း လုပ်ငန်းတွင် ပါဝင်ဆောင်ရွက်ရန် ဖိတ်ခေါ် ခြင်း ဖြစ်ပါတယ်။

အဓိကသုတေသီအမည် - ဒေါက်တာတိုးမောင်

ဌာန - ပြည်သူ့ကျန်းမာရေး တက္ကသိုလ် ရန်ကုန်

သုတေသနခေါင်းစဉ် - ရန်ကုန်ကလေးဆေးရုံကြီးမှ သူနာပြုဆရာ၊ ဆရာမများ၏ ကူးစက်ရောဂါ ကာကွယ်တားဆီးနှိမ်နှင်းရေးနှင့် စပ်လျဉ်း၍ သူနာပြုဆရာ၊ ဆရာမများ၏ ဗဟုသုတ၊ ခံယူချက်၊ သဘောထားနှင့် လက်တွေ့ လုပ်ဆောင်မှုကို သုတေသနပြုလုပ်ခြင်း

အပိုင်း(က) သုတေသန နှင့် သက်ဆိုင်သောအချက်များ

၁။ မိတ်ဆက်နိဒါန်း

ကျွန်တော် ဒေါက်တာတိုးမောင်သည် ပြည်သူ့ကျန်းမာရေးတက္ကသိုလ်၊ ရန်ကုန်မှ ဆေးရုံအုပ်ချုပ် မှူပညာ၊ မဟာသိပ္ပံသင်တန်းသား ဖြစ်ပါသည်။ ကျွန်တော့်အနေနဲ့ ရန်ကုန် ကလေးဆေးရုံကြီးတွင် တာဝန် ထမ်းဆောင်လျှက်ရှိသော သူနာပြုဆရာ၊ ဆရာမများ၏ ကူးစက် ရောဂါကာကွယ်တားဆီး နှိမ်နင်းရေးနှင့် စပ်လျဉ်း၍ သူနာပြုဆရာ၊ ဆရာမများ၏ ဗဟုသုတ၊ ခံယူချက်၊ သဘောထားနှင့် လက်တွေ့လုပ်ဆောင်မှုကို သုတေသနတစ်ခု ဆောင်ရွက်လိုပါသည်။ သုတေသနအကြောင်းကို ရှင်းပြပြီး သင့်အားပါဝင်ရန် ဖိတ်ခေါ်လိုပါသည်။ သင့်အနေနှင့် မရှင်းလင်းသည်များရှိပါက မေးမြန်းနိုင်ပါသည်။

၂။ ရည်ရွယ်ချက်

ဤသုတေသန၏ ရည်ရွယ်ချက်မှာ ရန်ကုန် ကလေးဆေးရုံကြီးတွင် တာဝန်ထမ်းဆောင်လျက် ရှိသော သူနာပြုဆရာ၊ ဆရာမများ၏ ကူးစက်ရောဂါကာကွယ်တားဆီးနိမ်နင်းရေးနှင့် စပ်လျဉ်း၍ သူနာပြုဆရာ၊ ဆရာမများ၏ ဗဟုသုတ၊ ခံယူချက်၊ သဘောထားနှင့် လက်တွေ့ လုပ်ဆောင်မှုများ မည်သို့ရှိမည်ကို လေ့လာလိုပါသည်။

၃။ သုတေသနဆောင်ရွက်ပုံအမျိုးအစား

ဤသုတေသနသည် သင်ကိုယ်တိုင် မေးခွန်းများကိုဖတ်၍ ဖြေဆိုရမည်ဖြစ်ပြီး မိနစ် ၄၀ခန့် ကြာမြင့်မည် ဖြစ်ပါသည်။

၄။ ပါဝင်မည့်သူများရွေးချယ်ခြင်း

သင့်အား ဤသုတေသန တွင်ပါဝင်ရန် ဖိတ်ခေါ်ခြင်းမှာ သင်၏လုပ်ဆောင်မှုများသည် ကူးစက်ရောဂါ ကာကွယ်တားဆီး နိမ်နင်းရေးနှင့်စပ်လျဉ်း၍ ပြုပြင်ရေး လုပ်ဆောင်မှုများအပေါ် အထောက် အကူပြုနိုင်မည်ဟု ယူဆ၍ ဖြစ်ပါသည်။

၅။ မိမိဆန္ဒ အလျောက်ပါဝင်ခြင်း

ဤသုတေသန တွင်သင်ပါဝင်ကူညီခြင်း သည် သင်၏ သဘောဆန္ဒအလျောက်သာ ဖြစ်ပါသည်။ ပါဝင်ခြင်း၊ မပါဝင်ခြင်းမှာ သင်၏ ဆန္ဒအတိုင်း ရွေးချယ်မှုသာဖြစ်ပါသည်။

၆။ လုပ်ဆောင်ပုံ

ဤသုတေသနတွင် ပါဝင်ဖို့ သင်သဘောတူမည်ဆိုလျှင် သင်ကိုယ်တိုင် မေးခွန်းများကို ဖတ်၍ ဖြေဆိုရမည် ဖြစ်ပြီး မိနစ် ၄၀ ခန့်ကြာမြင့် မည်ဖြစ်ပါသည်။ သင်သည် သီးသန့် နေရာတခု မှာဖြေဆိုရမှာဖြစ်ပြီး သင်၏လူမှုရေး အချက်အလက်များ၊ သိမှုဆိုင်ရာ အချက်အလက်များ၊ ခံယူချက် ဆိုင်ရာ အချက်အလက်များ၊ ကိုယ်တိုင်ဆန်းစစ်သော အလေ့အကျင့်ဆိုင်ရာ အချက်အလက်များ မည်သို့ ရှိမည်ကို လေ့လာလိုပါသည်။

မေးခွန်းများဖြေဆိုရာတွင် စိတ်အနှောင့်အယှက်ဖြစ်၍ မဖြေဆိုလိုသော မေးခွန်းများရှိပါက သင့်ဆန္ဒအလျောက် မဖြေ ဆိုဘဲ ငြင်းဆိုနိုင်ပါသည်။

၇။ အကျိုးကျေးဇူးများ

ဤသုတေသနတွင် ပါဝင်သောကြောင့် သင့်အတွက် တိုက်ရိုက်အကျိုးကျေးဇူးရရှိမည် မဟုတ်ပါ။ သို့သော် သင်ပါဝင်မှုသည် ကူးစက်ရောဂါ ကာကွယ်တားဆီးနိမ်နှင်းရေး လုပ်ငန်းများနှင့် ပတ်သက်၍ ပြုပြင်ရေးလုပ်ဆောင်မှုများအပေါ်တွင် အထောက်အကူ ဖြစ်စေပါသည်။

၈။ အချက်အလက်များသိမ်းဆည်းထားရှိခြင်း

ဤသုတေသနမှကောက်ယူရရှိသည့် အချက်အလက်များကို လုံခြုံစွာထားရှိမှာ ဖြစ်ပါသည်။ သင့်ထံမှ သိရှိရသည့်အချက်များကို သုတေသနအဖွဲ့မှ တပါး အခြားမည်သူမှ မသိစေရပါ။

၉။ သုတေသနရလဒ်များကို ဖြန့်ဝေခြင်း

ဤသုတေသန၏တွေ့ရှိချက်များကို စိတ်ဝင်စားသူများမှ သိရှိနိုင်စေရန် ရလဒ်များကိုသာ ဖြန့်ဝေ မှာဖြစ်ပါသည်။

၁၀။ ဆက်သွယ်ရမည့်ပုဂ္ဂိုလ်

အကြောင်းတစ်စုံတစ်ရာ မေးမြန်းလိုလျှင် ဒေါက်တာတိုးမောင်၊ ဖုန်း ၀၉-၄၅၁၂၂၉၈၉၈ ကို ဆက်သွယ်နိုင်ပါသည်။ ဤသုတေသနကို လူပုဂ္ဂိုလ်များအပေါ် သုတေသနပြုမူဆိုင်ရာ ကျင့်ဝတ် ကော်မတီမှ ခွင့်ပြုချက်ရရှိပြီး ဖြစ်ပါသည်။

အပိုင်း (ခ) သုတေသနတွင်ပါဝင်ရန် သဘောတူညီမှုပုံစံ

ကျွန်ုပ်သည် ရောဂါကာကွယ်တားဆီးနိုမ်နှင်းရေးနှင့် စပ်လျဉ်း၍ ဗဟုသုတ၊ ခံယူချက်၊ သဘော ထားနှင့် လက်တွေ့လုပ်ဆောင်မှုကို လေ့လာသော သုတေသနတွင် ပါဝင်ရန် ဖိတ်ခေါ်ခြင်းခံရပါသည်။ ဤသုတေသနတွင် ပါဝင်သောကြောင့် ကျွန်ုပ်အတွက် တိုက်ရိုက် အကျိုးကျေးဇူးမရရှိပါ။ ကျွန်ုပ်သည် ကိုယ်တိုင်မေးခွန်းများကို ဖတ်၍ ဖြေဆိုရမည်ဖြစ်ပြီး မိနစ် (၄၀) ခန့် ကြာမြင့်မည် ဖြစ်ကြောင်းနှင့် လူမှုရေးအချက်အလက်များ၊ သိမှုဆိုင်ရာ အချက်အလက်များ၊ ခံယူချက်ဆိုင်ရာ အချက်အလက်များ၊ ကိုယ်တိုင်ဆန်းစစ်သော အလေ့အကျင့်ဆိုင်ရာ အချက်အလက်များအား မေးမြန်းမှာဖြစ်ကြောင်း သိရှိရ ပါသည်။ ဤသုတေသနတွင် ကျွန်ုပ်သည် အထက်ဖော်ပြချက်များကို ဖတ်ရှုပြီးဖြစ်ပါသည်။ မရှင်းလင်း သည့် မေးခွန်းများကိုလည်း မေးမြန်းနိုင်၍ ၎င်းတို့ကို ကျွန်ုပ်သည် ကျေနပ်စွာဖြေဆို ပေးပါသည်။ ကျွန်ုပ် ဆန္ဒအလျောက် ဤသုတေသန တွင်ပါဝင်ရန် သဘောတူပါသည်။

သုတေသနတွင်ပါဝင်သူအမည် ----------

သုတေသနတွင်ပါဝင်သူလက်မှတ် ----------

ရက်စွဲ ----------

Annex (3) Questionnaire form (English and Myanmar)

Infection control precautions among nurses at Yangon Children Hospital

Date……. Serial No…….

(A) Demographic characteristics of nurses

1	How old are you? .....years	
2	What is your gender? (tick one)	
	(1) Male (2) Female	
3	How would you describe your current marital status? (tick one)	
	(1) Single –never married (2) Married (3) Separated (4) Divorced	
	(5) Widowed (6) Others	
4	What is your nursing level?	
	(1) Staff nurse (2) Trained nurse	
5	How long have you been working as a nurse? .....years	
6	Recent Ward ----------	
7	Have you been working at following wards? (tick more than one)	
	(1) Medical unit (2) Surgical care unit (3) Neonatal unit (4) Ortho unit	
	(5) OT (6) Medical ICU (7) Physiotherapy unit	
8	How long have you been working in the current unit? .....years	
	Have you ever had training on hospital infection control? (1) Yes (2) No	
9	If yes to Q 9, when were you trained?	
10	(1) Within 3 months	
	(2) Within 3 to 6 months	
	(3) Within 6 to 12 months	
	(4) More than 1 year	

(B) Knowledge on infection control precautions

1	Appropriate infection control measures can restrict the spread of infection from (1) patients to health care workers (2) patients to other patients (3) patients to attendants		
2	Health care associated infection which was present or incubation before admission.		
3	In health care facilities infections are transmitted by (1) _____ (2) _____ (3) _____		
4	There are two types of infection control precautions which are (1) _____ (2)_____		
5	Standard precautions include (1) Hand hygiene (2) Use of personal protective equipment (3) Appropriate handling of patient belongings, equipment and solid linen (4) Prevention of needle stick / sharp injuries (5) Appropriate handling of waste (6) Environmental cleaning and spills management		
6	Hand hygiene include (1) hand washing with soap and water (2) antisepsis (3) wearing glove (4) keeping the hand dry		

7	PPE include (1) Hair cover or cap (2) Eye wear or goggles (3) Mask (4) Gown (5) Apron (6) Gloves (7) Shoe covers (8) Disinfectant		
8	Transportation process (1) Patients care equipment should be preventing exposure to skin and mucous membranes, clothing and environment. (2) Linen to ensure that there is no leaking of fluid.		
9	Patient Placement process (1) Place patient in a single room in droplet infection (2) Optimum spacing between beds is 1-2 meters		
10	Air born infections are (1) Active/open pulmonary TB (2) Measles (3) Influenza type B (4) Chicken pox (5) Meningitis		
11	Hospital hazardous waste are (1) Infectious wastes which contain pathogens (2) Laboratory wastes (3) Sharps (4) Cytotoxic drugs (5) Papers and materials used in office (6) Toxic laboratory chemicals (7) Used swabs, gloves, mask and other PPE (8) Expired drug		

12	How do you manage sharps after using on the patient? (1) The needle and syringe are disposed of immediately after use into a puncture resistant container (2) The needle is recapped before disposing of the needle and syringe (3) Syringe and needle are disposed of together with other waste into available waste containers (4) The needle is bent before disposing of the needle and syringe into a puncture resistant container		
13	Hospital waste disposal method (1) Autoclave (2) Land- fill (3) Microwave (4) Incineration (5) Deep burial in a secure area		
14	Most common used disinfectants are (1)70% alcohol (2)1% hypochlorite (3) Bleaching powder		
15	Personal hygiene of nurse takes part in importance role of infection control.		

(C) Perception towards infection control precautions

	Perception	Strongly disagree	Agree	Don't know	Disagree	Strongly disagree
1	Hospital associated infections are occupational infection among health care workers.					
2	With proper infection control measure, there may be increased risk of hospital infection.					
3	Health care associated infection can lead to economic impact on patients and health care system.					
4	You must perform hand hygiene to protect yourself only.					
5	The use of gloves does replace the need to clean your hands.					
6	Don't share personal protected equipment.					
7	Never recap or bend needles.					
8	Utilization of surgical mask is effective for all airborne infection.					
9	Waste is disposed into available containers after segregating.					
10	The needle and syringe are disposed of immediately after use into a puncture resistant container.					

11	Hand hygiene is not necessary in between contact with different patients.					
12	Common towels can be used for drying hands.					
13	Plastic covered mattress clean with detergent and water between patients routinely.					
14	A clean environment plays an important role in the prevention of hospital associated infection.					
15	Facilities and materials required for infection control should not stock out.					

(D) Questions on practice of infection control precautions

1	Standard or routine precautions to be followed for all patients and additional precautions for selected patients. (1)Yes (2) No	
2	How often do you perform hand hygiene when delivering nursing care? (Choose more than one) (1) Before and after contact with each patient (2) Before and after performing any procedure between patients or on the same patient (3) Before putting on gloves and after removing gloves (4) After handling contaminated objects/ materials	
3	How do you clean your hand? (Choose more than one) (1) Soap and water (2) Water (3) Alcohol swabs (4) Antiseptic hand wash (5) Antiseptic hand gel	
4	What parts are exposed with soap and water during hand washing after patient examination? (choose appropriate one) (1) Hand only (2) Hand and Wrist (3) Hand and forearms	
5	Adequate hands washing with water and soap for _____ seconds (Choose appropriate one) (1) 40 -60 seconds (2) 20-30 seconds (3) <10seconds	
6	Alcohol based hand rubbing _____ seconds (Choose appropriate one) (1) 40 -60 seconds (2) 20-30 seconds (3) <10seconds	
7	At all times where contact with patient's blood, body fluid, excretion and secretions may occur, you must use PPE. (1) Yes (2) No	

8	Which mask have you used in care of MDR-TB patients? (tick one) (1) Surgical mask (2) N-95 mask	
9	Patients with air- born infection, which mask have you used in care? (tick one) (1) Surgical mask (2) N-95 mask	
10	Can you change gloves between contacts with different patients? (1)Yes (2) No	
11	What is the first remove when removing personal protective equipment? _____	
12	What would you like to choose in an infected case care (tick one)? (1) Disposable gown (2) Cotton reusable gowns	
13	How often do you use goggles/eye protection when doing procedures that are likely to generate risk? (1) Always (2) Sometimes (3) Rarely	
14	According to WHO color coding waste management, container color (chose more than one) (1) yellow for sharp waste (2) red for infectious waste (3) green for highly infection waste (4) black for garbage	
15	Hospital floor should be clean twice in each shift and more often if needed with detergent and water. (1) Yes (2) No	

(E) Questions on materials and Supplies for Infection Control Precaution Activities

	Please √ your answer	Adequate supply	Inadequate supply	No supply	Code
1.	Soap				
2.	Glove				
3.	Surgical Mask				
4.	N 95 Mask				
5.	Google				
6.	Cap				
7.	Gown				
8.	Apron				
9.	Boot				
10.	Disinfectants				
11.	Alcohol swabs				
12.	Antiseptic Hand gel				
13.	Dust bin				

ရန်ကုန်ကလေးဆေးရုံကြီးရှိ သူနာပြုဆရာ၊ ဆရာမများအား ဆေးရုံများတွင် ရောဂါကူးစက်မှု ကာကွယ်ထိန်းချုပ်ခြင်းလုပ်ငန်းေဆာင်ရွက်မှုများအတွက်မေးခွန်းလွှာ		
နေ့စွဲ		အမှတ်စဉ် --------
(က)	ဖြေဆိုသူ၏ နောက်ခံကိုယ်ရေးအကြောင်းအရာ	
၁	ပြည့်ပြီးအသက်	
၂	ကျား/မ	
၃	အိမ်ထောင်ရေးအခြေအနေ (၁)ခုဖြေဆိုပါ	
	(၁) အိမ်ထောင်ရှိ (၂) အိမ်ထောင်မရှိ	
၄	ရာထူး	
	(၁) အထက်တန်းသူနာပြု (၂) သူနာပြု	
၅	စုစုပေါင်းလုပ်သက် ---------- နှစ်	
၆	ယခုလက်ရှိ တာဝန်ထမ်းဆောင်လျက်ရှိသော လူနာဆောင် ----------	
၇	လက်ရှိလူနာဆောင်တွင် တာဝန်ထမ်းဆောင်သည့်ကာလ ---------- နှစ်	
၈	ယခင်တာဝန်ကျခဲ့သော လူနာဆောင်များ (တခုထက်ပို ဖြေနိုင်သည်) (၁) ---------- (၂) ---------- (၃) ---------- (၄) ----------	
၉	ကူးစက်ရောဂါကာကွယ်ရေးနှင့် ပတ်သက်သော သင်တန်း တက်ရောက်ဖူးခြင်းရှိ/မရှိ (၁) ရှိ (၂) မရှိပါ	
၁၀	ကူးစက်ရောဂါ ကာကွယ်ရေးသင်တန်း တက်ရောက်ခဲ့ဖူးလျှင် (၁) လွန်ခဲ့သော ၃လ အတွင်း (၂) ၃-၆ လအတွင်း (၃) ၆-၁၂ လအတွင်း (၄) ၁ နှစ်ကျော်	

(ခ) သိမှုဆိုင်ရာမေးခွန်းများ (မေးခွန်းများအားလုံးဖြေဆိုရန်)				
၁	ဆေးရုံများတွင်ရောဂါကူးစက်မှု မှန်ကန်စွာထိန်းချုပ်နိုင်ပါက	မှန်	မှား	မသိပါ
	(၁) လူနာမှ ကျန်းမာရေးဝန်ထမ်း			
	(၂) လူနာမှတခြားလူနာ			
	(၃)လူနာမှ လူနာစောင့်များသို့ ကူးစက်ရောဂါပိုးမွှား ပျံ့နှံ့ခြင်းကို ကန့်သတ်နိုင်သည်။			
၂	ဆေးရုံအတွင်း ကူးစက်ရောဂါပိုး (Hospital Acquired infection) ဆိုသည်မှာ ဆေးရုံမတက်ခင် ပါလာသောရောဂါဖြစ်သည်။			
၃	ဆေးရုံအတွင်း ကူးစက်ရောဂါပိုး ကူးစက်နိုင်သော နည်းလမ်း (mode of transmission) များမှာ (၁) ---------- (၂) ---------- (၃) ----------			
၄	ကူးစက်ရောဂါပိုးမွှားထိန်းချုပ်ရာတွင် သတိထားဆောင်ရွက်မှု (Precaution) (၂) ခုမှာ (၁) ---------- (၂) ---------- တို့ဖြစ်သည်			
၅	စံနမူနာသတိထားဆောင်ရွက်မှု (standard precaution) မှာ			
	(၁) လက်သန့်ရှင်းမှု			
	(၂) PPE အသုံးပြုမှု			
	(၃) လူနာ၏ အသုံးအဆောင်အခင်းအကျင်းများကို မှန်ကန်သော ကိုင်တွယ်မှု			
	(၄) ဆေးထိုးအပ်နှင့် ချွန်ထက်သောပစ္စည်းများ အန္တရာယ်မှ ကာကွယ်မှု			
	(၅) အညစ်အကြေးနှင့် အမှိုက်များအား မှန်ကန်သောကိုင်တွယ်မှု			
	(၆) ပတ်ဝန်းကျင်သန့်ရှင်းမှုနှင့် အညစ်အကြေးအရည်များကို စီမံမှုတို့ဖြစ်သည်။			

၆	လက်သန့်စင်မှု (hand hygiene) ပြုလုပ်ရာတွင်			
	(၁) လက်ကိုဆပ်ပြာ၊ ရေတို့ဖြင့် သန့်စင်ခြင်း			
	(၂) ဆေးရည်ဖြင့် သန့်စင်ခြင်း			
	(၃) လက်အိတ်ဝတ်ဆင်ခြင်း			
	(၄) လက်အားခြောက်သွေ့စွာထားခြင်း			
၇	PPE (Personal protective equipment) ဆိုသည်မှာ			
	(၁) ဆံပင်သိမ်းခေါင်းစွပ်			
	(၂) အကာအကွယ်မျက်မှန်			
	(၃) နှာခေါင်းစည်း			
	(၄) (Gown) ဝတ်ရုံ			
	(၅) Apron			
	(6) လက်အိတ်			
	(၇) အကာအကွယ်ဖိနပ်			
	(၈) ပိုးသတ်ဆေးရည် (disinfectant) တို့ပါဝင်သည်။			
၈	လူနာသယ်ဆောင်ရာတွင်			
	(၁) လူနာအတွက်အသုံးပြုမည့် ကျန်းမာရေးစောင့်ရှောက်မှု ကိရိယာပစ္စည်း (Health care equipment)များသည် အရေပြား၊ အဝတ် ပတ်ဝန်းကျင်တို့နှင့် ထိတွေ့မှုမရှိအောင် ကာကွယ်ရမည်။			
	(၂) လူနာသယ်ယူရာတွင် အခင်းအကျင်း Linen သည် ယိုပေါက်ပြဲခြင်းမရှိစေ။			
၉	လူနာများကိုနေရာချရာတွင်			
	(၁) လေထုမှတဆင့် ကူးစက်နိုင်သော (droplet infection) ရောဂါတူ လူနာများကို အခန်းတခန်းတည်းတွင် အတူထားရမည်။			
	(၂) ကုတင်တစ်ခုနှင့်တစ်ခုကြား အကောင်းဆုံးအကွာအဝေးမှာ (၃ ပေ မှ ၆ ပေ) ဖြစ်သည်။			

၁၀	လေထုမှတဆင့် ကူးစက်ပျံ့နှံ့နိုင်သော ရောဂါများ (air borne infection)မှာ			
	(၁) သလိပ်ပိုးတွေ့ TB ရောဂါ			
	(၂) ဝက်သက်ရောဂါ			
	(၃) အအေးမိတုပ်ကွေးရောဂါ			
	(၄) ရေကျောက်ရောဂါ			
	(၅) ဦးနှောက်အမြှေးရောင်ရောဂါတို့ ဖြစ်သည်။			
၁၁	အန္တရာယ်ရှိသော ဆေးရုံစွန့်ပစ်ပစ္စည်းဆိုသည်မှာ			
	(၁) ကူးစက်ရောဂါပိုး ပါဝင်နေသော အညစ်အကြေး			
	(၂) ဓာတ်ခွဲခန်းမှ ထွက်သောအညစ်အကြေး			
	(၃) ချွန်ထက်သောပစ္စည်းများ			
	(၄) အဆိပ်အတောက်ဖြစ်စေသော ဆေးဝါးများ (cytotoxic drugs)			
	(၅) စာရွက်များနှင့် ရုံးသုံးပစ္စည်းများ			
	(၆) ဓာတ်ခွဲခန်းမှ ဓာတုပစ္စည်းများ			
	(၇) အသုံးပြုပြီးသော ဂွမ်း၊ လက်အိတ်၊ နှာခေါင်းစည်းနှင့် အခြား PPE များဖြစ်သည်။			
	(၈) ရက်လွန်စွန့်ပစ် ဆေးဝါးများ (Expired drugs) တို့ဖြစ်သည်။			
၁၂	လူနာအတွက် အသုံးပြုပြီးသော ချွန်ထက်ပစ္စည်းများကို မည်ကဲ့သို့ စီမံဆောင်ရွက်သနည်း			
	(၁) ဆေးထိုးအပ်နှင့် ပြွန်များကို အသုံးပြုပြီးလျှင် မထိုးဖောက်နိုင်သော ပုံးအတွင်းသို့ ချက်ချင်း ပစ်ရန်			
	(၂) ဆေးထိုးအပ်အား မစွန့်ပစ်ခင် အဖုံးပြန်လည်စွပ်ခြင်း			
	(၃) ဆေးထိုးအပ်နှင့် ပြွန်များကို အခြားအမှိုက်များနှင့်အတူရောပြီး အမှိုက်ပုံးအတွင်း စွန့်ပစ်ရန်			
	(၄) ဆေးထိုးအပ်အား မစွန့်ပစ်ခင် ကွေးအောင်ပြုလုပ်ပြီး မထိုးဖောက်နိုင်သော ပုံးအတွင်းသို့ ပစ်ခြင်း			

၁၃	ဆေးရုံစွန့်ပစ်ပစ္စည်းများ စွန့်ပစ်ရာတွင် နည်းစနစ်များမှာ			
	(၁) အပူချိန်ဖိအားသုံး ပိုးသတ်ခြင်း (autoclave)			
	(၂) အမှိုက်ပုံတွင် စွန့်ပစ်ခြင်း (land fill)			
	(၃) ဓာတ်ရောင်ခြည်သုံးပြီး ပိုးသတ်ခြင်း(microwave)			
	(၄) မီးလျှံစက်ဖြင့် ဖျက်စီးခြင်း (incineration)			
	(၅) လုံခြုံရသော နေရာတွင် တွင်းတူးစွန့်ပစ်ခြင်း(deep burial)တို့ဖြစ်သည်။			
၁၄	အသုံးများသော ပိုးသတ်ဆေးရည် (disinfectants) များမှာ			
	(၁) ၇၀% alcohol			
	(၂) ၁%hypochlorite			
	(2) bleaching powder တို့ဖြစ်သည်။			
၁၅	သူနာပြုများ၏ တကိုယ်ရေသန့်ရှင်းမှုသည် ကူးစက်ရောဂါပိုး ကာကွယ်ရာတွင် အရေးကြီးသော အခန်းကဏ္ဍတွင် ပါဝင်သည်။			

(ဂ) ခံယူချက်ဆိုင်ရာမေးခွန်းများ		အဖြေ				
မေးခွန်းများ (အဖြေကို အကွက်တွင် √ ပေးပါရန်)		လုံးဝ သဘော တူသည်	သဘော တူသည်	မသိ ပါ	သဘော မတူပါ	လုံးဝ သဘော မတူပါ
၁	ကျန်းမာရေးစောင့်ရှောက်မှုဆိုင်ရာ ကူးစက်ရောဂါ (Health care associated Infection) ဆိုသည်မှာကျန်းမာရေးစောင့် ရှောက်သူ ဝန်ထမ်းများအတွက် လုပ်ငန်းခွင်အန္တရာယ်ဆိုင်ရာ ကူးစက်နိုင်သောရောဂါဖြစ်သည်။					
၂	မှန်ကန်သောကူးစက်ရောဂါပိုးထိန်းချုပ်ခြင်း ဖြင့် (HAI)ဆေးရုံအတွင်း ကူးစက်ရောဂါပိုး ဖြစ်ပွားမှုကို ပိုဆိုးစေသည်။					
၃	ဆေးရုံအတွင်း ကူးစက်ရောဂါပိုး (HAI)ဝင်ရောက်ခြင်းသည် လူနာများအတွက် ငွေကုန်ကြေးကျ များကာ ကျန်းမာရေးစနစ်ကို ထိခိုက် စေနိုင်သည်။					
၄	မိမိလက်သန့်စင်မှုသည် မိမိကိုယ် ကာကွယ်ခြင်း တစ်ခုတည်းသာဖြစ်သည်။					
၅	လက်အိတ်ဝတ်ခြင်းဖြင့် လက်သန့်ရှင်းအောင်ဆောင်ရွက်နိုင်သည်။					
၆	အသုံးပြုပြီးသော PPE ကို မျှဝေပြီးမသုံးသင့်ပါ။					
၇	ဆေးထိုးအပ်များကို အဖုံးပြန်စွပ်ခြင်း၊ ကွေးအောင်ပြုလုပ်ခြင်းမပြုလုပ်သင့်ပါ။					
၈	လေထုထဲမှ ကူးစက်ရောဂါပိုး ပျံ့နှံ့ခြင်း (air borne transmission) ကို သာမန်နှာခေါင်းစွပ် (surgical mask) သုံးခြင်းဖြင့် ထိရောက်စွာ ကာကွယ်နိုင်သည်။					
၉	အမှိုက်အညစ်အကြေးများကို အမျိုးအစား ခွဲခြားပြီးမှသာလျှင် စွန့်ပစ်သင့်သည်					

၁၀	ဆေးထိုးအပ်နှင့်ပြွန်တို့ကိုအသုံးပြုပြီးလျှင် မထိုးဖောက်နိုင်သောပုံး(သို့)Safety(box) အတွင်းချက်ချင်းစွန့်ပစ်ရမည်။					
၁၁	လူနာနှင့်အခြားလူနာများအား ထိတွေ့ကိုင်တွယ်ရာတွင် လက်သန့်စင်မှုကိုအဓိကမကျပါ။					
၁၂	လက်ကိုခြောက်သွေ့အောင် ဆောင်ရွက်ရာတွင် ပုဝါတဘက် တစ်ခုတည်းကိုအများ စုပေါင်းသုံးနိုင်သည်။					
၁၃	ဆေးရုံတက်ဆင်း လူနာတစ်ဦးနှင့် တစ်ဦးကြားပလပ်စတစ်ဖြင့်ဖုံးထားသော မွေ့ယာများကို ရေနှင့်ဆေးရည်ရောပြီး ပုံမှန်သန့်ရှင်းသင့်သည်။					
၁၄	ပတ်ဝန်းကျင်သန့်ရှင်းရေးသည် ဆေးရုံအတွင်း ကူးစက်ရောဂါပိုးကို ကာကွယ်ရာတွင် အရေးကြီးသော အခန်းခဏ္ဍတွင် ပါဝင်သည်။					
၁၅	ကူးစက်ရောဂါပိုးထိန်းချုပ်ရာတွင် လိုအပ်သော အသုံးအဆောင်ပစ္စည်းများ ပြတ်တောက်ခြင်းမရှိရန် စီမံထားသင့်သည်။					

(ဃ) ကိုယ်တိုင်ဆန်းစစ်သောအလေ့အကျင့်ဆိုင်ရာမေးခွန်းများ (ကိုယ်တိုင်ကျင့်သုံးမှုကိုဖြေဆိုပါ)				
		မှန်	မှား	မသိပါ
၁	လူနာအားလုံးအတွက် စံနမူနာသတိထားဆောင်ရွက်မှု (standard precaution) နှင့် ကူးစက်ရောဂါပိုးပျံ့နှံ့ခြင်း အခြေခံသတိထားဆောင်ရွက်မှု (additional precaution)ကိုမူ သီးခြားလူနာများအတွက် လိုက်နာကျင့်သုံးပါသလား။			
၂	လူနာပြုစုကုသနေစဉ်အတွင်း ဘယ်အချိန်တွင် သင့်လက်သန့်စင်မှုကို ပြုလုပ်မည်နည်း။ (တစ်ခုထက်ပိုပြီးဖြေဆိုနိုင်ပါသည်)			
	(၁) လူနာတစ်ဦးချင်းစီမထိတွေ့မီနှင့် ထိတွေ့ပြီးနောက်			
	(၂) လူနာတစ်ဦးတည်း (သို့မဟုတ်) လူနာများကြား ကုသမှုတစ်ခုခုမလုပ်မီနှင့် လုပ်ပြီးကာလ			
	(၃) လက်အိတ်မဝတ်မီ လက်အိတ်ချွတ်ပြီးကာ			
	(၄) ကူးစက်ရောဂါပိုး ရှိနိုင်သော အရာဝတ္ထုပစ္စည်းများကို ကိုင်တွယ်ရာတွင်လည်းကောင်း ပြုလုပ်သည်။			
၃	သင်၏ လက်ကိုမည်ကဲ့သို့ သန့်စင်မည်နည်း။ (တစ်ခုထက်ပိုပြီးဖြေဆိုနိုင်ပါသည်)			
	(၁) ဆပ်ပြာနှင့်ရေ			
	(၂) ရေ			
	(၃) အရက်ပြန်နှင့်ဂွမ်း			
	(၄) ပိုးသတ်ဆေးပါလက်ဆေးရည် (hand wash)			
	(၅) ပိုးသတ်ဆေးပါ လက်ဆေးရည်(ပျစ်) (hand gel)			
၄	လူနာစမ်းသပ်ပြီးနောက် သင်၏လက်ကိုဆပ်ပြာရည်တို့ဖြင့် ဆေးရာတွင် လက်၏မည်သည့်အစိတ်အပိုင်းထိ ဆေးမည်နည်း။(အသင့်တော်ဆုံးတစ်ခုသာဖြေဆိုပါ။) (၁) လက်တစ်ခုတည်း (၂) လက်မှ လက်ကောက်ဝတ်ထိ (၃) လက်မှ တံတောင်ဆစ်ထိ			
၅	သင်ဆပ်ပြာနှင့် ရေတို့ဖြင့်လက်ဆေးရာတွင် လုံလောက်သော လက်ဆေးခြင်းအချိန်မှာမည်မျှဖြစ်သနည်း။ (အသင့်တော်ဆုံးတစ်ခုသာ ဖြေဆိုပါ)			
	(၁) ၄၀ - ၆၀ စက္ကန့်			
	(၂) ၂၀ - ၃၀ စက္ကန့်			
	(၃) < ၁၀ စက္ကန့်			

၆	အရက်ပြန်နှင့်လက်ကို ဆေးပွတ်ရာတွင် ကြာချိန်မှာ မည်မျှ ဖြစ်သနည်း။(အသင့်တော်ဆုံးတစ်ခုသာဖြေဆိုပါ။			
	(၁) ၄၀ - ၆၀ စက္ကန့်			
	(၂) ၂၀ - ၃၀ စက္ကန့်			
	(၃) < ၁၀ စက္ကန့်			
၇	လူနာ၏ သွေး၊ အရည်၊ အညစ်အကြေးများနှင့် ထိတွေ့ရသည့်အခါတိုင်းသင်သည် PPE အသုံးပြုပါသလား။			
၈	ဆေးယဉ်ပါး TB လူနာများအား ပြုစုကုသရာတွင် မည်သည့်နှာခေါင်းစည်းအား အသုံးပြုမည်နည်း။			
	(၁) သာမန်နှာခေါင်းစည်း			
	(၂) N-95 နှာခေါင်းစည်း			
၉	လေမှတဆင့် ကူးစက်နိုင်သောရောဂါ (airborne infection) ခံစားနေရသောလူနာများကို ကြည့်ရှုရာတွင် မည်သည့်နှာခေါင်းစည်းအား အသုံးပြုမည်နည်း။			
	(၁) သာမန်နှာခေါင်းစည်း			
	(၂) N-95 နှာခေါင်းစည်း			
၁၀	လူနာတစ်ဦးနှင့်အခြားလူနာတစ်ဦးကြား ထိတွေ့ရာတွင် လက်အိတ် ပြောင်းဝတ်ပါသလား။			
၁၁	PPE ဝတ်စုံပြည့်အား ပြန်လည်ချွတ်ရာတွင် မည်သည့် အရာအား ပထမဦးစွာချွတ်သနည်း။ ----------			
၁၂	ကူးစက်ရောဂါပိုးရှိလူနာများအား ကုသရာတွင်မည်သည့်ဝတ်ရုံ (gown)ကို ရွေးချယ်အသုံးပြုမည်နည်း။			
	(၁) တစ်ခါသုံးဝတ်ရုံ (disposable gown)			
	(၂) ပြန်လည်အသုံးရသော ချည်ဝတ်ရုံ (Cotton reusable gown)			
၁၃	အန္တရာယ်ရှိသော ကုသမှုပြုလုပ်ရာတွင် အကာအကွယ် မျက်မှန်ကို အသုံးပြုပါသလား။			
	(၁) အမြဲအသုံးပြုသည်။			
	(၂) တခါတရံသုံးသည်။			
	(၃) သုံးခဲသည်			
	(၄) လုံးဝမသုံးပါ။			

၁၄	WHO အမှိုက်ပုံးအရောင်နှင့် အမှိုက်ခွဲခြားစနစ် ပြုလုပ်ရာတွင် (တစ်ခုထက်ပိုပြီးဖြေဆိုနိုင်ပါသည်)			
	(၁)အဝါရောင်သည် ချွန်ထက်သောပစ္စည်းများအတွက် ဖြစ်သည်။			
	(၂) အနီရောင်သည် ကူးစက်ရောဂါပိုး အညစ်အကြေးများအတွက် သာ ဖြစ်သည်။			
	(၃) အစိမ်းရောင်သည် ပြင်းထန်ကူးစက်ရောဂါပိုးအတွက် ဖြစ်သည်။			
	(၄) အနက်ရောင်သည် စားကြွင်းစားကျန် အမှိုက်အညစ် အကြေးများအတွက်ဖြစ်သည်။			
၁၅	ဆေးရုံကြမ်းပြင်အား တစ်နေ့လျှင် (၂)ကြိမ်ရေနှင့် ပိုးသတ် ဆေးကိုအသုံးပြုပြီး ပုံမှန်သန့်ရှင်းသင့်ပါသည်။			

(c)ကူးစက်ရောဂါကာကွယ်ထိန်းချုပ်ခြင်းအတွက် လုပ်ငန်းသုံးပစ္စည်းများရရှိခြင်းဆိုင်ရာ အခြေအနေ

	(အဖြေကို အကွက်တွင် √ ပေးပါရန်)	လုံလောက်စွာ ရရှိသည်	လုံလောက်စွာ မရရှိပါ	လုံးဝ မရရှိပါ
၁။	ဆပ်ပြာ			
၂။	လက်အိတ်			
၃။	နှာခေါင်းစည်း(Mask)			
၄။	N 95 နှာခေါင်းစည်း			
၅။	အကာအကွယ်မျက်မှန်(Google)			
၆။	ဆံပင်သိမ်းခေါင်းစွပ်(Cap)			
၇။	ဝတ်ရုံ(Gown)			
၈။	Apron			
၉။	အကာအကွယ်ဖိနပ်			
၁၀။	ပိုးသတ်ဆေးရည်			
၁၁။	အရက်ပြန်ငွေ့မီး			
၁၂။	ပိုးသတ်ဆေးပါလက်ဆေးရည်(ပျစ်) (Hand gel)			
၁၃။	အမှိုက်ပုံး			
၁၄။	Safety box			

ဆေးရုံများတွင် ရောဂါကူးစက်မှု ကာကွယ်ထိန်းချုပ်ခြင်းလုပ်ငန်း နှင့်ပတ်သက်၍ အကြံပြုချက်

Annex (4) Scoring System

No	Knowledge	Scoring			
1.	Appropriate infection control measures can restrict the spread of infection from				
	(1) patients to health care workers	Yes	1	No	0
	(2) patients to other patients	Yes	1	No	0
	(3) patients to attendants	Yes	1	No	0
2.	Health care associated infection which was present or incubation before admission.	Yes	0	No	1
3.	In health care facilities infections are transmitted by				
	(1) air	Yes	1	No	0
	(2) droplets	Yes	1	No	0
	(3) contact of blood and body substances	Yes	1	No	0
4.	There are two types of infection control precautions which are				
	(1) standard precautions	Yes	1	No	0
	(2) additional precautions.	Yes	1	No	0
5.	Standard precautions include				
	(1) Hand hygiene	Yes	1	No	0
	(2) Use of personal protective equipment	Yes	1	No	0
	(3) Appropriate handling of patient belongings, equipment and solid linen	Yes	1	No	0
	(4) Prevention of needle stick / sharp injuries	Yes	1	No	0
	(5) Appropriate handling of waste	Yes	1	No	0
	(6) Environmental cleaning and spills management	Yes	1	No	0
6.	Hand hygiene include				
	(1) hand washing with soap and water	Yes	1	No	0
	(2) antisepsis	Yes	1	No	0
	(3) wearing glove	Yes	0	No	1
	(4) keeping the hand dry	Yes	0	N0	1

7.	PPE are				
	(9) Hair cover or cap	Yes	1	No	0
	(10) Eye wear or goggles	Yes	1	No	0
	(11) Mask	Yes	1	No	0
	(12) Gown	Yes	1	No	0
	(13) Apron	Yes	1	No	0
	(14) Gloves	Yes	1	No	0
	(15) Shoe covers	Yes	1	No	0
	(16) Disinfectant	Yes	0	No	1
8.	Transportation process				
	(3) Patients care equipment should be prevent exposure to skin and mucous membranes, clothing and environment.	Yes	1	No	0
	(4) Linen to ensure that there is no leaking of fluid.	Yes	1	No	0
9	Patient Placement process				
	(1) place patient in a single room in droplet infection	Yes	1	No	0
	(2) Optimum spacing between beds is 3-6 feet	Yes	1	No	0
10	Air born infections are				
	(6) Active /open pulmonary TB	Yes	1	No	0
	(7) Measles	Yes	1	No	0
	(8) Influenza type B	Yes	0	No	1
	(9) Chicken pox	Yes	1	No	0
	(10) Meningitis	Yes	1	No	0
11	Hospital hazardous waste are				
	(1) Infectious wastes which contain pathogens	Yes	1	No	0
	(2) Laboratory wastes	Yes	1	No	0
	(3) Sharps	Yes	1	No	0
	(4) Cytotoxic drugs	Yes	1	No	0
	(5) Papers and materials used in office	Yes	0	No	1
	(6) Toxic laboratory chemicals	Yes	1	No	0
	(7) Used swabs, gloves, mask and other PPE	Yes	1	No	0
	(8) Expired drug	Yes	1	No	0

12	How do you manage sharps after using on the patient?				
	(1) The needle and syringe are disposed of immediately after use into a puncture resistant container	Yes	1	No	0
	(2) The needle is recapped before disposing of the needle and syringe	Yes	0	No	1
	(3)Syringe and needle are disposed of together with other waste into available waste container	Yes	0	No	1
	(4)The needle is bent before disposing of the needle and syringe into a puncture resistant container	Yes	0	No	1
13.	Hospital waste disposal method				
	Autoclave	Yes	1	No	0
	land- fill	Yes	1	No	0
	Microwave	Yes	1	No	0
	Incineration	Yes	1	No	0
	Deep burial in a secure area	Yes	1	No	0
14	Most common used disinfectants are				
	(1)70% alcohol	Yes	1	No	0
	(2)1% hypochlorite	Yes	1	No	0
	(3) Bleaching powder	Yes	1	No	0
15	Personal hygiene of nurse takes part in importance role of infection control.	Yes	1	No	0

No	Perception	Score				
		Strongly agree	**Agree**	**Don't know**	**Disagree**	**Strongly disagree**
1.	Hospital associated infections are occupational infection among health care workers.	5	4	3	2	1
2.	With proper infection control measure, there may be increased risk of hospital infection.	1	2	3	4	5
3.	Health care associated infection can lead to economic impact on patients and health care system.	5	4	3	2	1
4.	You must perform hand hygiene to protect yourself only.	1	2	3	4	5
5.	The use of gloves does replace the need to clean your hands.	1	2	3	4	5
6.	Don't share personal protected equipment.	5	4	3	2	1
7.	Never recap or bend needles.	5	4	3	2	1
8.	Utilization of surgical mask is effective for all airborne infection.	1	2	3	4	5

9.	Waste is disposed into available containers after segregating.	5	4	3	2	1
10.	The needle and syringe are disposed of immediately after use into a puncture resistant container.	5	4	3	2	1
11.	Hand hygiene is not necessary in between contact with different patients.	1	2	3	4	5
12.	Common towels can be used for drying hands.	1	2	3	4	5
13.	Plastic covered mattress clean with detergent and water between patients routinely.	5	4	3	2	1
14.	A clean environment plays an important role in the prevention of hospital associated infection	5	4	3	2	1
15.	Facilities and materials required for infection control should not stock out.	5	4	3	2	1

No	Practice on infection control measure	Scoring			
1	Standard or routine precautions to be followed for all patients and additional precautions for selected patients.	Yes	1	No	0
2	How often do you perform hand hygiene when delivering nursing care? (5) Before and after contact with each patient (6) Before and after performing any procedure between patients or on the same patient (7) Before putting on gloves and after removing gloves (8) After handling contaminated objects/ material	 Yes Yes Yes Yes	 1 1 1 1	 No No No No	 0 0 0 0
3	How do you clean your hand? (1) Soap and water (2) Water (3) Alcohol swabs (4) Antiseptic hand wash (5) Antiseptic hand gel	 Yes Yes Yes Yes Yes	 1 0 1 1 1	 No No No No No	 0 1 0 0 0
4	What parts are exposed with soap and water during hand washing after patient examination? (1) Hand only (2) Hand and wrist (3) Hand and forearms	 (1) (2) (3)	 0 1 0		
5	Adequate hands washing with water and soap for _____ seconds (1) 40 -60 seconds (2) 20-30 seconds (3) <10seconds	(1) (2) (3)	1 0 0		
6	Alcohol based hand rubbing _____seconds (1)40 -60 seconds (2) 20-30 seconds (3) <10seconds	(1) (2) (3)	0 1 0		
7	At all times where contact with patient's blood, body fluid, excretion and secretions may occur, you must use PPE.	Yes	1	No	0

8	Which mask have you used in care of MDR-TB patients? (1) Surgical mask (2) N-95 mask	(1) (2)	0 1		
9	Patients with air born infection, which mask have you used? (1) Surgical mask (2) N-95 mask	(1) (2)	0 1		
10	Can you change gloves between contacts with different patients?	Yes	1	No	0
11	What is the first remove when removing personal protective equipment?	Glove Others	1 0		
12	What would you like to prefer in an infected case? (1) Disposable gown (2) Cotton reusable gowns	(1) (2)	1 0		
13	How often do you use goggles/eye protection when doing procedures that are likely to generate risk? (1) Always (2) Sometimes (3) Rarely (4) Not used	(1) (2) (3) (4)	3 2 1 0		
14	According to WHO color coding waste management, container color (1) yellow for sharp waste (2) red for infectious waste (3) green for highly infection waste (4) black for garbage	Yes Yes Yes Yes	1 0 0 1	No No No No	0 1 1 0
15	Floor should be clean twice in each shift and more often if needed with detergent and water.	Yes	1	No	0

Annex (5) Gantt chart

Month	August				September				October				November				December			
Week	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**
Protocol preparation																				
Protocol defend																				
Pilot study – Preparation for data collection																				
Data collection																				
Data entry and analysis																				
Preparation for Grand Presentation																				
Thesis preparation																				
Submission of Thesis (Draft)																				
Thesis defend																				
Correction and Submission of thesis																				

Annex (6) Checklist form

Checklist for infection control

Name of hospital __ _____ Name of unit _____

State/Division _____ Date of assessment _____

No	Items	Yes	No	Comment
1	Is there running water?			
2	Are washbasins easily accessible?			
3	Are there the hand washing reminders and posters available?			
4	Are there adequate supplies necessary for adherence to hand hygiene? (soap and alcohol-based hand rub			
5	Are there facilities for drying without contamination? (paper towel)			
6	Are the sterilized instruments and materials placed in separated placed?			
7	Are there any puncture resistant containers for syringes and needles?			
8	Are the syringes and needles placed into puncture resistant containers?			
9	Do the hands wash promptly after contact with infective material?			
10	Do the hands wash immediately after removing gloves?			
11	Are there surgical mask and glove always easily available at all clinical work sites?			
12	Do the nurses wear gloves when in contact with blood, body fluids, secretions, excretions, mucous membranes, and contaminated materials?			
13	Do the nurses use disposable needle and syringes?			
14	Do the nurses handle all the sharps with extreme care?			

15	Are N95 masks easily available if necessary?			
16	Are there adequate spacing between beds?			
17	Are the floors cleaned and dust free?			
18	Are the toilets cleaned?			
19	Do the spills of infective material clean up promptly?			
20	Are there adequate supplies necessary for adherence to cleaning of hospital environment and disinfectant/ detergent?			
21	Are dressing rooms/treatment rooms and trolleys clean?			
22	Are there appropriate waste management facilities?			
23	Is there appropriate waste handling?			
24	Are the patient care equipment, supplies and linen contaminated with infective material discarded, disinfected or sterilized between each patient use?			
25	Does the linen boiled, if no washing machine is available for linen soiled with infective material?			

Annex (7) Curriculum Vitae

Name	Dr Toe Maung
Gender	Male
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Academic qualification	1.Dip. Med.Sc (HA), (2016), University of Public Health, Yangon 2. M.B., B.S (1997), University of Medicine Mandalay
Employment history	1. Assistant director, Engineer Department, Office 4, Department of Medical Services, Ministry of Health and Sports (4.4.2018 to date) 2. Assistant director, Department of Medical Services, Ayeyarwady Division (2.9.2016-31.3.2018) 3. Assistant director, Yangon General Hospital (16.3.2016-31.8.2016) 4. Township Medical Officer, Kyonpyaw Township, Ayeyarwady Division (2.5.2010-15.3.2016) 5. Township Medical Officer, Kanbalu Township, Sagaing Division (8.4.2009-30.4.2010) 6. Township Medical Officer, Pin Laung Township, Southern Shan State (28.2.2007-31.3.2009) 7. Station Medical Officer, Samar Station Hospital, Kyaukse Township (7.10.2002-15.2.2007) 8. Township Medical Officer, Lahe Township, Sagaing Division (15.3.2001-30.9.2002) 9. Assistant Surgeon, Mandalay General Hospital (10.10.1998-28.2.001)
Publication	-