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KNOWLEDGE AND COMPLIANCE OF INFECTION CONTROL POLICIES OF NURSES IN A TERTIARY CARE HOSPITAL

Eva Lobelle Sampayan*¹ and Megie Hervas²

¹Department of Medical-Surgical Nursing, King Khalid University College of Nursing, Khamis Mushayt, Kingdom of Saudi Arabia.

²Department of Nursing Service, Sacred Heart Hospital, Cebu, Philippines.

ABSTRACT

This study aimed to assess the extent of knowledge and compliance to infection control policies of nurses in a private tertiary care hospital. Data were collected using a pretested, researcher-made questionnaire. Chi-square and Pearson-r was used to identify associated factors. T-test was used to determine the difference between knowledge and compliance to infection control policies. The extent of knowledge among nurses is very good and compliance to infection control is very high. Age ($\chi^2=1.655$, $p=.038$) is associated to the extent of knowledge and area of assignment is significant to the extent of knowledge ($\chi^2=70.572$, $p=.029$) and compliance to infection control policies ($\chi^2=94.989$, $p=.059$). There is a relationship between the knowledge and compliance to infection control policies ($r=.361$, $p=.019$). The knowledge ($t=53.313$, $p=.000$) and compliance ($t=53.255$, $p=.000$) of nurses significantly differs according to area of assignment. More training and educational programs are needed to update knowledge and compliance to infection control.

KEYWORDS

Extent of knowledge, Compliance to infection practices and Private staff nurses.

Author for Correspondence:

Eva Lobelle Sampayan,
Department of Medical-Surgical Nursing,
King Khalid University College of Nursing,
Khamis Mushayt, Kingdom of Saudi Arabia.

Email: sampayan428@gmail.com

INTRODUCTION

Effective patient care is the heart of nursing profession. Everyday procedures are performed to help patient recover from their illness and improve their health condition. Nurses action in the healthcare environment requires responsibility and accountability. Adequate nursing knowledge and practices are essential in meeting the needs of the patients. Failure to practice safe nursing actions can affect the general quality of care. The nurse plays a big role in nurturing the patient back to an optimal

level of functioning. To be effective, an environment must be conducive to the patient's recovery as well as an environment that prevents the transfer of disease producing microorganisms from one person to the other are essential.

Nurses as frontliners in the hospital are expected to adhere to infection control measures to protect patients and themselves. There are reasons for non-compliance with these measures include: Lack of knowledge, interference with work skills, risk perception, conflict of interest, not wanting to offend the patient, lack of equipment and uncomfortable personal protective equipment (PPE). The most important factor that contributes to non-compliance is the non-availability of relevant modalities¹.

In Jamaica, a study on knowledge, awareness and compliance with universal precautions among health care workers employed in the health sector for longer periods were more aware of universal precautions compared with those who served for shorter periods². In North Eastern Nigeria, a published study found out that those with ten years and above working experience had a high level of awareness of universal precautions than those with below five years. Compliance with the use of sterile gloves, handling and disposal of needles and other sharp objects was higher than the knowledge of these procedures recorded especially among those with experience of ten years and above³. In Southeast Nigeria, on the other hand, a study on knowledge and practice of universal precautions against blood borne pathogens amongst house officers and nurses in tertiary health institutions showed that the most important factor influencing universal precautions practice is the lack of provision of adequate protective equipment. Other factors, all of which show significant difference between the doctors and nurses include carelessness; lack of display of universal precautions guidelines; emergency nature of the procedure; insufficient water supply; patient perceived to be at low risk of blood borne pathogens; pressure of time; and universal precautions equipment interfering with technical skills⁴.

Nosocomial infections are classified as infections that are associated with the delivery of health care services in a health care facility. It can either develop

during a clients stay in a facility or manifest after discharge. Nosocomial infections or hospital-acquired infections (more appropriately called health-care associated infections) are today by far the most common complications affecting hospitalized patients⁵. A study on 100 nurses in the intensive care unit concluded that the infection control knowledge among the nurses was fairly good; however, there is still a wide scope of improvement with regular educational programs and in-house training⁶. A Jordanian national study⁷ revealed that nurses who reported that they had been trained about infection control procedures in their hospital scored higher on the infection control practice scale than nurses who never received any infection control training in the hospital. Also, a study conducted in Jordan showed that nurses who received infection control training in the hospital demonstrated higher compliance than those who never received such training. Nurses who work in university affiliated hospitals demonstrated higher compliance than other types of hospital⁸.

A cross-sectional study in the north of Jordan about knowledge and compliance with standard precautions among registered nurses demonstrates that standard precautions are the basic level of the infection control process. More training programs and more focusing on the standard precautions by educational institutes are needed for nurses to improve their knowledge and compliance with infection-control standard precautions⁹.

In a tertiary care hospital in New Delhi, the study revealed that the nurses had poor knowledge about standard precautions; nurses had inadequate knowledge about the transmission of blood-borne pathogens; more than three-four were aware about hepatitis-B vaccine. Majority practiced washing soiled hands immediately; and more than half used gowns and gloves very often. Refresher training was the major source of information. In Malaysia, a study on the knowledge of blood-borne infectious diseases and the practice of universal precautions amongst health-care workers revealed that there was a small, positive correlation between knowledge and actual practice of universal precautions amongst the cohort studied. Factors such as age and years of experience did not contribute towards acquisition of knowledge

about blood-borne illnesses or the practice of universal precautions¹⁰.

In Italy, a research on knowledge, attitudes, and behavior of healthcare workers and health-care associated infections in emergency departments found that health care workers who often or always used gloves and performed hands hygiene measures after removing gloves were nurses, provided care to fewer patients, and knew that hands hygiene after removing gloves was a control measure¹¹. In Ghana, a study on knowledge, attitude and practice was carried out to health professionals and showed the need for the ministry of health, the Ghana health service and its institutions to develop and implement specific policies on the practice of universal basic precautions, training of health care providers and ensuring the consistent supply of protective materials¹².

Objective

This study aimed to assess the extent of knowledge and compliance to infection control policies of nurses in a tertiary care hospital in Cebu, Philippines.

MATERIAL AND METHODS

A correlation descriptive design was used. Sample selection was by non-probability convenience sampling. The study sample consisted of 40 registered nurses from different nursing units. Information on the knowledge and compliance to infection control policies was elicited using pretested (Cronbach $\alpha=0.85$), structured, self-administered questionnaire. The questionnaire consisted of three (3) parts. The first part focused on the sociodemographic characteristics in terms of age, sex, educational level, area of assignment, and length of stay. The 2nd part includes 20 items pertaining to the extent of knowledge of infection control policies. A 4 point-Likert scale from 1 (very good) to 4 (poor) was used. The 3rd section dealt on the extent of compliance on infection control policies of nurses with 33 items. Responses on 1 (very high compliance) to 4 (very low compliance) was used. Data were analyzed using frequencies and percentages and mean scores. The test of correlations was measured using Chi-square and Pearson

product-moment correlation coefficient. Independent T-test was used to determine the difference between the extent of knowledge and compliance to infection control policies when grouped according to area of assignment. Approval from the university research committee was sought prior to the initiation of the study. A formal letter of permission to conduct the study was sought from the hospital administrators and informed consent was obtained from the respondents. Confidentiality of data was maintained throughout the duty.

RESULTS AND DISCUSSION

Table No.1 shows the sociodemographic characteristics of the respondents. The majority of the nurses were females, 29(65.9%). The mean age of the nurses were 26.5 years. Thirty-three (75%) nurses obtained BS nursing degree and eleven (25%) nurses are on their master's program. Out of 44 participants, the majority (n=31, 70.4%) of nurses are assigned in specialized areas, of which 10 intensive care unit nurses, 3 neonatal intensive care unit nurses, 6 emergency room nurses and 12 operating room nurses while only 13(29.5%) of them were from the general nursing medical-surgical department.

Table No.2 presents the extent of knowledge of infection control policies of nurses. The study revealed that the nurses had very good knowledge about infection control policies. Knowledge that universal precaution is an effective way to protect doctors, nurses and other health care workers (HCWs) from infection with blood borne viruses obtained the highest mean (1.00±.00) of all the items presented in the table. The item on getting hospital acquired infections makes them possibly a carrier for the rest of their life was rated very good (M=1.61±.75) and rank last of all the items shown in the table.

Table No.3 discloses the extent of compliance on infection control policies of nurses. Nurses highly complied (M=1.00±.00) on wearing gloves when touching blood, body fluids, secretions, excretions and contaminates items was highly complied by the nurses. The statement on reusing single items like

syringes, suction catheters, OGT's, NGT's was rated low ($M=3.09\pm 1.29$).

Table No.4 presents the correlation of sociodemographic characteristics, extent of knowledge and compliance to infection control policies of nurses. The chi-squared test ($\chi^2=1.655$, $p=.038$) results that factor on age is significant to the extent of compliance of infection control policies. Further, the study showed significant correlation between the extent of knowledge ($\chi^2=70.572$, $p=.029$) compliance to infection control ($\chi^2=94.989$, $p=.059$) of nurses and area of assignment.

Table No.5 shows that there is a significant correlation between the extent of knowledge and compliance to infection control policies of nurses ($r=.361$, $p=.019$).

Table No.6 shows that the extent of knowledge ($t=53.313$, $p=.000$) and compliance ($t=53.255$, $p=.000$) of nurses to infection control policies significantly differs according to their area of assignment.

Discussion

The main result of the present study is that nurses from specialized areas and general nursing wards rated their extent of knowledge as very good and very highly compliant to infection control policies. The findings relate to the study conducted in Italy about knowledge, attitudes, and behavior of healthcare workers and health-care associated infections in emergency departments found that health care workers who often or always used gloves and performed hands hygiene measures after removing gloves were nurses, provided care to fewer patients, and knew that hands hygiene after removing gloves was a control measure¹¹. A cross-sectional study in the north of Jordan about knowledge and compliance with standard precautions among registered nurses demonstrates that standard precautions are the basic level of the infection control process.

There was a significant positive correlation between age and extent of compliance of nurses to infection control. This current study affirms findings by Safrudin and Milkhatun¹³, who also found that there is a significant relation between the age of nurses and adherence. A person's knowledge can

affect one's persistence in carrying out a procedure of action, the more age a person eats his knowledge will also increase. However, the result of this present study contradicts the findings that factors such as age and years of experience did not contribute towards acquisition of knowledge about blood-borne illnesses or the practice of universal precautions¹⁰. In this study, the findings suggest that person become mature in their ways and action as they age.

The research result found that the variable on area of assignment shows significant relationship to the extent of knowledge and compliance of nurses. In this study, the findings suggested that the extent of knowledge and compliance to infection control likely depends on the area of assignment of nursing duties. Little to not at all is known about comparison studies between areas of assignment, nurses' knowledge and compliance that greatly support the findings of this current investigation. The findings of this study can be attributed by the periodic monitoring and assessment of the infection control committee in the hospital.

In nursing profession, nurses are constantly guided by the theoretical model of environmental nursing. Florence Nightingale asserted that the hospital is one environment that is filled with microorganisms. She identified ventilation and warmth, light, noise, variety, bed and bedding, cleanliness of rooms and walls and nutrition. Nightingale noted that a dirty environment was a source of infection through the organic matter it contained. The appropriate handling of and disposal of bodily excretions and sewage was required to prevent contamination of the environment¹³. A study conducted by Salem¹⁴ on knowledge and practices of nurses assigned in medical and surgical units about infection control and prevention revealed that the majority of nurses had good knowledge about infection control measures in relation to hand washing before, after, gloving, disinfection, and discarding. This might be related to the majority of nurses attend of in-service training about infection control conducted by infection control committee in the hospital.

The present study has demonstrated that there is a significant relationship between the extent of knowledge and compliance to infection control. The

result of this investigation can be related to the theoretical explanations of theory of reasoned action by Ajzen and Fishbein that underlines humans are rational decision makers who make use of whatever information is available to them. The theory proposes that adoption of a new behavior results from individual intention to engage in the behavior. If it is believed that the behavior will result in a positive outcome, the attitude toward the behavior will be positive and there is a greater likelihood of adopting new behavior¹⁵. The strength of an attitude is indicated by the amount of knowledge in which it is based and how that knowledge was acquired. People tend to behave in ways that are consistent with their attitude when they are well informed. Additionally, the self-efficacy theory by Albert Bandura somehow supports the findings of the study. The theory is based on a person’s expectations relative to a specific course of action. According to Bandura, self-efficacy is used as an outcome determinant and is cognitively appraised and processed through performance accomplishments evidenced in self-mastery of similarly expected behaviors and vicarious experiences such as observing successful expected behavior through the modeling of others. The findings are also related to some research work.

A Jordanian national study⁷ revealed that nurses who reported that they had been trained about infection control procedures in their hospital scored higher on the infection control practice scale than nurses who never received any infection control training in the hospital. Also, a study conducted in Jordan showed that nurses who received infection control training in the hospital demonstrated higher compliance than those who never received such training. Interestingly, the conduct of this study has demonstrated a significant difference between area of assignment, extent of knowledge and compliance to infection control of nurses in the tertiary care hospital. The results indicated that nurses in specialized areas and general nursing wards to which they are assigned is a contributing factor of their knowledge and compliance to infection control.

Table No.1: Demographic characteristics of the sample

S.No	Profiles	Frequency, n=44	Percentage
Age			
1	22	1	2.3
2	23	2	4.5
3	24	4	9.1
4	25	12	27.3
5	26	9	20.5
6	27	4	9.1
7	28	6	13.6
8	29	2	4.5
9	30	2	4.5
10	31	2	4.5
Sex			
11	Female	29	65.9
12	Male	15	34.1
Education Level			
13	BS Nursing	33	75

14	Master's Degree	11	25
Area of Assignment			
15	Specialized Areas	31	70.4
16	General nursing wards	13	29.5
Length of Service			
17	1-5 years	42	95.4
18	6-10 years	2	4.5

Table No.2: Mean scores for extent of knowledge on infection control policies, (n=44)

S.No	Variable	Mean±SD
1	I know how to apply universal precautions in my work.	1.20±.40
2	Universal precaution is same as barrier in nursing.	1.41±.62
3	Universal precaution is an effective way to protect doctors, nurses and other health care workers (HCWs) from infection with blood borne viruses.	1.00±00
4	A mask should be worn in all procedures where blood and body fluids may splash.	1.45±.62
5	Gloves should be worn for all procedures that may involve contact with blood and body fluids.	1.02±.15
6	Eye protection should be worn for all procedures where blood and body fluids may splash.	1.02±.15
7	Hands should always be washed after every procedure that involves direct patient contact.	1.02±.15
8	Used needles and other sharps should be disposed of separately from other waste.	1.18±.39
9	Blood that has spilled on the ground should be cleaned up immediately.	1.09±.29
10	I feel my patients are potential carriers to infectious organisms that can be transmitted to me.	1.29±.46
11	I am more likely to contract hospital acquired infections than other people.	1.30±.56
12	There is high possibility that I will acquire infections because of the nature of the job.	1.20±.40
13	There is a high possibility that I will acquire infections because of the nature of the procedures commonly done in my unit.	1.31±.51
14	If I will get hospital acquired infections, there is a possibility that I will be a carrier for the rest of my life.	1.61±.75
15	When I comply with infection control practices, I feel safer.	1.04±.75
16	Adhering to infection control practices will decrease my chance of getting hospital acquired infections.	1.25±.48
17	If I comply with infection control practices, I decrease my chance of suffering from the ill-effects of hospital acquired infections.	1.31±.51
18	If I comply with infection control practices, I will decrease the chance of transmitting hospital acquired infections to other patients.	1.15±.36
19	If I comply with infection control practices, I will decrease the chance of transmitting infections to members of my household.	1.09±.29
20	If I comply with infection control practices, I would be able to work better.	1.27±.45

Table No.3: Mean scores for extent of infection control practices, (n=44)

S.No	Variable	Mean±SD
1	Wash hands after touching blood, body fluids, secretions, excretions and contaminated items.	1.02±.15
2	Wash hands immediately after gloves are removed and between patient contact.	1.13±.34
3	Wash hands prior to preparing medications and treatment procedure.	1.27±.49
4	Wash hands after suctioning and other patient contact.	1.02±.15
5	Wear gloves when touching blood, body fluids, secretions, excretions and contaminated items	1.00±00
6	Put on clean gloves just before touching mucous membranes and non-intact skin.	1.04±.21
7	Change gloves tasks and procedures in the same patient after contact with materials that may contain high concentration of microorganisms.	1.11±.32
8	Remove gloves promptly for contaminated items and environmental surfaces and before going to another patient.	1.15±.36
9	Wash hands immediately to avoid transfer of microorganisms to other patients and environment.	1.06±.25
10	Wear mask to protect mucous membranes of the nose and mouth during procedures.	1.13±.34
11	Wear eye protection to protect mucous membranes of the eyes.	1.88±.96
12	Wear face shield to protect mucous membranes of the eyes, nose and mouth during procedures.	1.72±.92
13	Wear protective devices during patient care activities that are likely to generate splashes or sprays of blood, body fluids, secretions or excretions.	1.13±.46
14	Wear gown to protect skin and prevent soiling of clothing during procedures that are likely to generate splashes or sprays of blood, body fluids, secretions or excretions.	1.40±.75
15	Remove a soiled gown as promptly as possible and wash hands immediately to avoid transfer of microorganisms to other patients and environments.	1.20±.46
16	Handle used patient-care equipment soiled with blood, body fluids, secretions or excretions in a manner that prevents skin and mucous membrane exposure.	1.09±.29
17	Prevents contamination of clothing.	1.22±.42
18	Prevents transfer of microorganisms to other patients and environments.	1.06±.25
19	Ensure that reusable equipment is not used for the care of another patient until it has been appropriately cleaned and reprocessed.	1.00±00
20	Single used items are properly discarded.	1.04±.21
21	Reuse single items like syringes, suction catheters, OGT's, NGT's.	3.09±1.29
22	Follow hospital procedures for routine hospital care.	1.06±.25
23	Disinfect environmental surfaces like beds, bed rails, bedside equipments and other frequently touched surfaces.	1.15±.52
24	Handle, transport, and process used linens soiled with blood, body fluids, secretions or excretions in a manner that prevents exposures and contamination of clothing and transfer of microorganisms to other patients and environments.	1.20±.46
25	Prevent injuries. When using needles and sharps.	1.02±.15
26	When handling instruments after procedures;	1.02±.15
27	When cleaning used instruments.	1.02±.15
28	When disposing used needles.	1.00±.00
29	Recap needles.	1.15±.42
30	Remove used needles from disposable syringe by hand.	2.06±1.10

31	Place disposable needles, syringes, scalpels and blades and other sharp items in puncture resistant sharp containers.	1.06±.45
32	Use resuscitation devices as alternative to mouth-to-mouth resuscitations	1.29±.50
33	Consult the infection control team if a private room is not available	1.09±.29

Table No.4: Correlations among profile, extent of knowledge and compliance of infection control policies

S.No	Variables Correlated	χ^2 , (p-value)	Variables Correlated	χ^2 , (p-value)
1	Age and Extent of Knowledge	80.274 (.759)	Age and Extent of Compliance	1.655 (.038)**
2	Sex and Extent of Knowledge	12.963 (.226)	Sex and Extent of Compliance	20.529 (.153)
3	Educational Level and Extent of Knowledge	4.108 (.942)	Educational Level and Extent of Compliance	12.529 (.639)
4	Area of Assignment and Extent of Knowledge	70.572 (.029)**	Area of Assignment and Extent of Compliance	94.989 (.059)**
5	Length of Years as Staff and Extent of Knowledge	69.317 (192)	Length of Years as Staff and Extent of Compliance	1.078 (.097)

*Significant at 5% level

Table No.5: Correlation between extent of knowledge and compliance of infection policies

S.No	Variables Correlated	Pearson-r	p-value
1	Extent of Knowledge and Compliance of Infection Control Policies	.361	.019**

*Significant at 5% level

Table No.6: Difference between the extent of knowledge and compliance of infection control policies

S.No	Variables correlated	t-test	p-value
1	Area of Assignment and Extent of Knowledge of Compliance of Infection Control Policies	53.313	.000**
2	Area of Assignment and Extent of Compliance of Infection Control Policies	53.255	.000**

*Significant at 5% level

CONCLUSION

There was very good knowledge and very high compliance of nurses towards infection control policies. The nursing area of assignment is a factor to consider when monitoring and evaluating knowledge and extent of implementing infection control practices. Although the evaluation of knowledge and compliance is astounding, continued trainings and regular educational programs about infection control are absolutely necessary for improvement and safe quality nursing interventions.

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CONFLICT OF INTEREST

The authors declared that there are no competing interests.

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