

Knowledge and Practices of Nurses in Infection Prevention and Control within a Tertiary Care Hospital

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Abstract

Nurses play a crucial role in preventing and controlling transmission of the infection through the application of standard precautions and maintenance of the health care environment. In hospitals, infected patients are a source of infection transmission to other patients, health care workers, and visitors. Healthcare-related infections have a considerable impact on the morbidity and mortality rates in the intra- and extra-hospital environment, resulting in an increase in the time spent and costs of hospitalization, and are thus recognized as a serious world public health problem. For example, Nosocomial infection is one of the leading causes of death. The prevention and control of infections are critical for a well-functioning health system. The aim of this study is to evaluate the knowledge and practice of 60 nurses working in medical and surgical units at tertiary care hospital in relation to infection control measures. A questionnaire and an observation checklist were the data collection tool. The result of the study revealed that the majority of the sample had good knowledge about infection control measures, but they showed lack of practice in hand washing and using gloving which are the most significant items to prevent transmission of infection. In conclusion, nurse managers need to supervise the staff nurses on the practicing infection prevention standards and techniques and monitor nursing adherence to policies of the hospital. The Administrators should promote feedback on practice, individual reinforcement and appropriate rewards for the good practice.

Keywords: Infection control; Nurses; Nosocomial infection; Hand washing; Gloving

Introduction

In hospitals, infected patients are a source of infection transmission to other patients, health care workers and visitors.^[1] Healthcare-related infections have a considerable impact on the morbidity and mortality rates in the intra- and extra-hospital environment, resulting in an increase in the time spent and costs of hospitalization, and are thus recognized as a serious world public health problem.^[2] Nosocomial infection, also known as hospital-acquired infections is one of the leading causes of death and has much economic cost due to increased hospitalization and prognosis.^[3] The prevention and control of infections are critical for a well-functioning health system.^[4] Infection control practice is a fundamental aspect of modern health care.^[5] World Health Organization in 2011 defined infection control as infection prevention and control measures that aims to ensure the protection of those who might be vulnerable to acquiring an infection both in the general community and in hospitals while receiving care due to health problems. The basic principle of infection prevention and control is hygiene.^[6] Hand hygiene is widely acknowledged to be the most important activity that reduces the spread of infection.^[7]

Nurses play a crucial role in preventing and controlling transmission of an infection through the application of standard precautions and maintenance of the health care environment. All, nurses, in all roles and settings, can demonstrate leadership in infection prevention and control by using their Knowledge, skills, and judgment to initiate appropriate and immediate infection control procedures.^[8] WHO classified some role of nursing staffs for infection control. Nurses at different levels, namely: the senior nursing administrator, the ward charge nurse and the nurse in charge of infection control. In addition, control committee needs to be established for developing training programmer for members of the nursing staff; supervising the implementation of techniques for the prevention of infections.^[9]

Most health care infections are transmitted by health care personnel who fail to practice proper hand washing procedures and change gloves between client contacts. Therefore, infection control guidelines from the national and international organization have supported that hand washing remains the most effective measure in reducing the incidence of health care infections.^[10,11] Brooker, Waugh, and Waston stated that hospitalized patient exposed to infection resulting from a surgical or medical treatment called iatrogenic infection is frequently attributed to an invasive procedure and reported that over 60% of blood infection introduced by intravenous lines or catheter.^[12] In addition It has been reported that the incidence of nosocomial infections in the intensive care unit is about 2 to 5 times higher than in the general inpatient hospital population.^[13] Health care infections are considered a major public health problem in both epidemic and endemic form because they are the main causes of morbidity, mortality and economic burden.^[14]

On the other hand, health care providers have exposed to blood born infection especially hepatitis B, C and HIV due to recapping of a needle and sharps injuries. In 2002, the WHO report published data demonstrating that 2.5% of HIV cases and 40% of hepatitis Band C cases among health care workers worldwide are the results of occupational exposure.^[15] According to the Joint United Nations Program on HIV/acquired immune deficiency syndrome (AIDS) (UNAIDS), about 34 million people are infected with HIV worldwide.

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An estimated 0.8% of adults aged 15 to 49 years worldwide are living with HIV, and the majority of them live in Asia and Africa.² The AIDS in Saudi Arabia (SA) was diagnosed and reported from Riyadh in 1984.³ Epidemiological data on HIV infection in Saudi Arabia come mostly from point prevalence surveys, mandatory screening, facility-based surveillance, and surveys of high risk groups. There is a paucity of general population HIV prevalence data within Saudi Arabia and the Eastern Mediterranean region. The estimate of UNAIDS of 2011 puts the general prevalence rate of less than 0.02%. For the period 1984 through 2009, a total of 15 157 cases with HIV infection were reported from Saudi Arabia: 4003 (26%) cases among Saudi citizens and 11 194 (74%) cases among expatriates.^[16]

The Joint Commission on Accreditation of health care Organization (JACO) and the centers for disease control and Prevention (CDC) documented that health care provider's should follow certain guidelines when caring for clients such as wash hands thoroughly after removing gloves and before and after all client contact, wear gloves when there is direct contact with blood, don't break or recap needles, discard into puncture-resistant containers, and disposal of contaminated items.^[17-19]

Nursing professionals play an important role in the prevention and control of hospital infections since they carry out direct contact with the individual, invasive and potentially contaminated procedures, as well as the manipulation of patient equipment, instruments and medications.^[20-22]

The aim of the study

The aim of this study is to evaluate the knowledge and practice of nurses in relation to infection control measures

Methods

Study design

A cross-sectional descriptive study was used to assess a nurse's knowledge and practice of infection control measures within tertiary care hospital.

Setting

The study was conducted in largest, prominent and oldest health care organization affiliated by the ministry of health in Saudi Arabia. Also, it was accredited nationally. The study was conducted in medical unit and general surgical units. This Hospital provides primary, secondary and tertiary health care services, for a multiplicity of specialization.

Subject

A convenient sample of sixty nurses working in medical and surgical units.

Tools

The researcher utilized a questionnaire with closed-ended questions to assess the knowledge and practice of the nurses in relation to infection control measures. In addition to observation, checklist was used to assess their performance regarding the compliance of infection control measures. The compilation of the questionnaire was done through literature review, consultation with experts in the field of infection control. The content of the questions included best practices from, Centre for Disease Control guidelines as per 2009 & 2011 as well as WHO's guidelines on prevention of hospital-acquired infections in 2002 and 2013 respectively.^[6,15,21,22]

Pilot study

During the pilot study, the questionnaire was pre-tested to identify

problems with the design and to refine the questionnaire. To conduct the pilot study 10% of nurses at the same government tertiary hospital from each unite was selected. The time required completing the questionnaire and the observation checklist was also observed and confirmed.

Validity

During the pilot study, a self-developed, closed-ended questionnaire and observation checklist was used to determine knowledge and practices among nurses in infection control measures. Therefore, the validity of the instrument was evaluated. To maximize validity, representative questions for each unite were designed and evaluated against the desired outcome. A specialist in nursing practice, infection prevention, and control professional nurse and nursing academic agreed on the face validity of the questionnaire.

Reliability

The instrument was designed by the researcher in conjunction with expertise in infection control and nursing field to establish the reliability of the instrument, the pilot study was conducted at the same government tertiary hospital from each assigned unite was selected.

Procedures

Official approval to conduct the study was taken from the administration of a selected setting

Ethical issues about participants' consent, no identifying information was required from the participants, which saves the privacy of the study participants was informed that they had the freedom to withdraw from the study at any time. Data collection plan was developed with official communication with the selected setting for the distribution and retrieval of questionnaires. The plan was discussed with the head nurses of units after and explained the purpose of the study and ethical aspect of the survey to collect the data from their staff.

The scoring system for nurse's knowledge and practice regarding infection control measures according to the scale:

Good: (75% or more, the correct complete answer for knowledge and promptly done for practice)

Fair: (50% <75% correct incomplete answer for knowledge, done for practice inaccurately)

Poor: (<50% incorrect answers for knowledge, not done for practice)

Statistical analysis

Data were collected then analyzed using SPSS program for data tabulation, presentation, and statistical analysis. Data were coded, entered and analyzed included: number and percentage. Chi-square was used to estimate the significant differences between different variables.

Results

The sample characteristics of the study revealed that 41.7% of nurses age ranged between 20 years to less than 25 years of age and (75%) of nurses were in Saudi. The majority of the sample (68.3%) years of experience were less than 5 years. The highest percentage (60%) of nurses held a diploma degree in nursing and half of the sample 50% attend training program about infection prevention. Also, 63.3% working as a staff nurse.

Table 1 shows nurses knowledge and practice related to infection control measures during patient care, as regards of hand washing

Table 1: Frequency and percent of nurses' knowledge and practice related to infection control measures (N= 60).

Variables	Knowledge						Practice					
	Good		Fair		Poor		Good		Fair		Poor	
	F	%	F	%	F	%	F	%	F	%	F	%
Hand washing before	5	8.3	47	78.3	8	13.3	0	0	0	0	60	100
Hand washing after	60	100	0	0	0	0	7	11.7	0	0	53	88.3
Gloving	43	71.7	17	28.3	0	0	19	31.7	7	11.7	34	56.7
Disinfection	38	63.3	22	36.7	0	0	33	55	21	35	6	10
Discarding	56	93.3	4	6.7	0	0	25	41.7	34	56.7	1	1.7
Total Score	36	60	24	40	0	0	0	0	29	48.3	31	51.7

Table 2: The relationship between nurses' practice and demographic profile regarding infection control measures.

Variables	Hand washing before		Gloving		Disinfection		Discarding	
	F	P	F	P	F	P	F	P
Age	0.870	0.462	1.082	0.364	1.524	0.218	1.583	0.204
Level of Education	1.981	0.127	2.256	0.092	1.374	0.260	4.303	0.008*
Current Position	2.060	0.080	5.159	0.001*	2.085	0.081	3.497	0.008
nationality	0.552	0.649	0.636	0.595	3.551	0.02*	3.235	0.029
Experience	0.702	0.555	0.952	0.417	0.123	0.946	0.592	0.623
Training program	0.002	0.964	20.690	0.000*	0.116	0.735	2.233	0.141

*Significant p<0.05

Table 3: The relationship between nurse's knowledge and selected demographic profile among infection control measures.

Variables	Hand washing before		Gloving		Disinfection		Discarding	
	F	P	F	P	F	P	F	P
Age	4.613	0.594	3.289	0.349	5.115	0.164	6.00	0.112
Level of Education	13.226	0.01*	5.495	0.064	1.885	0.399	14.082	0.001*
Current Position	1.437	0.964	18.039	0.000*	6.994	0.072	19.091	0.000*
nationality	1.614	0.446	1.941	0.247	4.689	0.030*	12.857	0.000*
Experience	9.758	0.135	2.94	0.401	1.315	0.715	1.986	0.575
Training program	1.404	0.496	15.755	0.000*	0.25	0.632	29.005	0.001*

*Significant p<0.05

(78.3%) of nurses had fair knowledge while all the nurses' knowledge about hand washing after had good. However, all of the nurses had poorly practice of hand washing before and after patient care. In relation to, nurses' knowledge about gloving, disinfection and discarding were good (71.7%, 63.3%, and 93.3%). Generally, (60%) of the nurses had good knowledge and 51.7% had poor practice about infection control measures.

Table 2 shows the relationship between nurses' practice and Demographic Profile Regarding infection control measures it shows that there are significant differences between mean scores of nurses' practice and level education and discarding equipment, current position and gloving wear, nationality and mean scores of disinfection procedures.

Table 3 shows the relationship between nurse's knowledge and selected demographic profile among infection control measures. There were significant differences between the nurse's knowledge and level of education in hand washing before and discarding the equipment also the current position. Nationality and attend training program had significant differences with discarding the equipment.

Discussion

The present study was conducted on a sample of 60 nurses, 29 nurses working in medical wards and other 31 nurses working in the surgical ward. The majority are young nurses' ages between 20-24 years and diploma graduates with short experience (less than 5 years). The study attempted to assess nurse's knowledge relevant to infection control measures. In addition to, observation of nurses' practice of hand washing before and after, gloving, disinfection and discarding waste material

The result of this study 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 result of this study was consistent with several researchers revealed that health care workers had good knowledge about infection control measures. [11,18,19,23,24] While, these result was not in agreement with Soliman and Ghaleb who reported that most of the nurses had poorly knowledgeable regarding standard precaution this is due to lack of awareness and training and education of nurses. [25,26]

Regarding the practice of infection control measures, the majority of nurses had a poor practice of hand washing before and after the procedure, gloving. Hand hygiene and glove utilization are the simplest, most effective measure for preventing both transmissions of infections to patients from health care personnel and also protecting health care personnel from acquiring infections from infected body surfaces, body fluids or blood of patients. Although, the presence of accessible supplies but health care workers' adherence to guidelines is poor. [27] However, numerous studies have supported the present study which revealed that poor infection control practice in hand hygiene and gloving utilization. [18,23,27-30] This poor practice in hand hygiene and glove utilization might be related to forgetfulness, ignorance of guidelines, insufficient time, high workload, skin irritation by hand hygiene agents or latex gloves, low risk for acquiring infection from patients, and many nurses may felt that gloves hinder their skillful performance of duties especially in situation that calls for immediate intervention.

Findings of the present study also indicated that there were no significant differences between nurse's knowledge and practice of infection control measures. The result might be interpreted by careless

to the importance of infection control and safe health practices. Similar findings were reported in several types of research conducted to monitor the evidence of lack of compliance with infection control practices among a wide variety of health care workers.^[30]

Conclusion

It was concluding that the majority of the sample had good knowledge about infection control measures, but they showed lack of practice in hand washing and using gloving which are the most significant items to prevent transmission of infection.

Recommendations

This study we recommended that Nurse managers need to be supervising the staff nurses on the practicing infection prevention standards and techniques and monitoring nursing adherence to policies of the hospital. The Administrators should promote feedback of practice, individual reinforcement and appropriate rewards for the good practice.

Conflict of Interest

The authors disclose that they have no conflicts of interest.

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