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KNOWLEDGE OF NOSOCOMIAL INFECTION PREVENTION AMONG THE NURSES IN SURGICAL WARD AT A PUBLIC HOSPITAL IN DHAKA, BANGLADESH

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Abstract: *This study aimed to identify nurses' level of knowledge regarding Nosocomial Infection prevention. This cross-sectional study was conducted at Dhaka Medical College Hospital (DMCH). A total of 150 nurses working at DMCH were recruited following the exclusion & inclusion criteria using a convenience sampling method. The data were collected through structured questionnaires and analyzed using the SPSS. The study findings showed that the mean age of the participants was 38.5 years, and 86.7% of the nurses were female. About 63.3% had a diploma in nursing, and 36.70% had 5 years of job experience. More than two-fifths (45.3%) received the information regarding the prevention of nosocomial infection, whereas 96.7% wanted to attend the educational program on the prevention of nosocomial infection. Most of the respondents (84.0%) mentioned that environment is the major source of nosocomial infection. This study revealed the nurse's level of knowledge regarding nosocomial infection is not up to the standard level/satisfactory, to expand the nurse's knowledge regarding prevention of nosocomial infection, the in-service training, organizing short courses, conducting seminars and symposiums, and other suitable programs to be initiated for expanding to date knowledge.*

Keywords: *Hospital, Infection, Nosocomial, Nurse, Prevention, Bangladesh*

Introduction

Globally, nosocomial infection is considered as a prominent public health problem which is evident with its prevalence rate (3.0-20.7%) and the incidence rate (5-10 %)[1-2]. In comparison with the developed nations, the developing countries was afflicted with twenty times higher[3]. Notably, an infection is clinically considered as nosocomial, if it becomes evident 48 hours or more after hospital admission or within 30 days of discharge following inpatient care4. Moreover, nosocomial infection denotes a new disorder after admission within 48 hours of the hospital. Additionally, it is also termed as hospital-acquired infection (HAIs) but appears after discharge and is also infectious among the facility staff. The importance of hospital-acquired infections goes beyond its effect on morbidity and mortality statistics in any country and bears a deeper level of economic implications. With an aim to prevent the onset and progression of healthcare-acquired infections (HAIs) is one of the prime duties of all health care providers including doctors, nurses, cleaners, ward assistants etc.Additionally, the professionals who are working on infection control need evidence-based educational contents that helps to facilitate in decreasing the vivacity of HAIs.

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Clinical and support staff in health care institutions are inundated with the required level of training facilitated by the accrediting bodies under the state level institutional stewardship role[5].

As per the evidence, about (5 to 10%) of all patient admissions to the hospitals in the USA and western Europe were found as complicated by HAIs. Each year, 1.7 million infections result in approximately 99,000 deaths in the USA and more than 177000 infections occurred in Australia6. In the context of Bangladesh, hospital acquired infection developed among one out of every twenty patients with a hospital-stay larger than 3 days with an incidence rate of 6.1 cases per 1000 patient days[7]. To kick off using alcohol-based hand rub dwindles the risk of transmitting the progression of multidrug-resistant bacteria between the patients[8]. Additionally, it is recommended to apply technological devices for minimizing the health-risks borne as infection in the hospita[l9].

Over the last couple of decades, it has been observed that services related to radiology have gone through different substantial changes. Significantly, the prone to happening of the accidental blood and infectious pathogens generated exposure augments due to the installments of the interventional radiology and other special imaging modalities[10]. Considering the health-risks, a standard level of precautions needs to be implemented in order to reduce the possibility of attaining infections generated from both the known and unknown sources while delivering health care to the patients[10]. With an aim to address nosocomial infection due to the lack of compliance with hand hygiene, consistent endeavors are being performed with an aim to address the workable and sustainable interventions. Among them, one of the intervention was “My five moments for hand hygiene” by the leading global health agency. Notably, these five moments encompass the followings; before contacting with the patients, before doing aseptic and cleaning the procedures, after getting exposed at risk of the body fluids, after contacting with the patients, and after contacting with the patient surroundings. Instrumentally, this intervention of five momentum has been widely accepted and recognized to scale up the level of knowledge, training, monitoring, and reporting hand- hygiene among the healthcare providers[11]. A study finding revealed that nurses and physicians had insufficient level of knowledge regarding standardization and isolative precautions[12,4]. A rigid form of adherence by the healthcare workers in terms of standardized control over infection may prevent the potential health risks[13]. As per the findings of a study, the medical students hardly wash their hands after examining the patients[14].

Notably, a study was conducted among the nurses only for exploring the level of knowledge regarding the surgical site infection (SSI) prevention[15]. However, no study aiming at figuring out the level of knowledge holistically on nosocomial infection is yet to conduct in the context of Bangladesh. Therefore, the present study aimed to assess the knowledge of nurses about nosocomial infection prevention in the surgery wards.

Materials and Methods

Research Design and setting

A descript cross-sectional survey was conducted during April to October; 2014. The researcher opted out of this design purposively due to the time and financial constraints. A descriptive design is particularly helpful while researching little-known phenomena. The study was carried out in the Dhaka Medical College Hospital (DMCH). It is one of the largest 200 bedded tertiary-level government hospitals in Bangladesh, situated in the capital city of Bangladesh. It is a referral hospital that provides many treatment facilities for patients throughout the country. There is medicine, surgical, neurosurgical,

casualty, post-operative, ICU other different surgical wards for giving care to surgical patients. The setting for this study was surgical wards, post-operative wards, neuron surgery, and casualty ward Dhaka. More than 800 staff nurses are working in this hospital. This large number of staff nurses made this hospital a good choice to conduct this study.

Study Population

This target population was all staff nurses working in the surgery post-operative, casualty, other surgical wards at Dhaka Medical College Hospital.

Sampling technique and inclusion criteria

Non-probable convenience sampling technique was used. The study area was wards of the Dhaka Medical College Hospital, Dhaka. With the co-operation of the nursing superintendent and the nurse in charge, the researcher recruited nurses during their duty period of the surgery post-operative, casualty, and other surgical wards of the target hospital. The sample of this study was 150 nurses working in the surgery post-operative, casualty, and other surgical wards at Dhaka Medical College Hospital. In this study, the inclusion criteria and inclusion of the samples were (1) Staff nurses working in the surgery post-operative, casualty, other surgical wards (2) Those who were given informed consent willing to participate in the study.

Data collection instrument

The data collection tool was developed by keeping the study's objectives as the framework that reflects the study variables. Therefore, the instruments for data collection were structured and semi-structured questionnaires. This questionnaire was checked and edited by the concerned teachers and experts. In this study, the instruments included (1) the socio-demographic characteristics of the nurses and (2) the Infection Control Standardized Questionnaire.

Socio-demographic Characteristics

The researcher developed this questionnaire to assess the general characteristics of the staff nurses in the surgery, post-operative, casualty, and other surgical wards. This questionnaire comprises four items of age, gender, educational level, and work experiences.

The Infection Control Precautions Standardized Questionnaire (ICPSQ)

The researcher used and modified this questionnaire, which the infection control experts developed according to global prescriptions on standard isolation precautions and hand hygiene. This questionnaire comprises 6 particular areas:

i. Staff nurses' knowledge regarding nosocomial infection (4 items)

ii. Standard precautions (4 items),

iii. Hand hygiene (4 items),

iv. A risk of splashes (4 items),

v. The indication for the use of alcohol-based hand rub (4 items), and

vi. Education program (3 items).

(Each item rated by Yes = 1, No = 2,)

Data Collection Procedures/ Data collection technique

The data was collected from the respondent using a questionnaire, after taking written consent from the participants, following the selection criteria (inclusion and exclusion criteria) of the study.

Data Analysis

In the present study, the software program statistical package for social science (SPSS) was used in order to analyze the data. Importantly, the summarized results from the raw data were found using the normal descriptive statistics including the frequency distributions, the measures of central tendency along with the use of percent. Additionally, both the tabular and the pictorial presentation were used in order to ensure lucid presentation of the findings.

Ethical Clearance

The submitted proposal of the study was reviewed and approved by the research ethics committee of the Daffodil International University, Dhaka, Bangladesh. During the data collection, the data collectors rigidly maintained to brief the objectives of conducting the research and receive the informed consent from the study participants with the strong commitment of anonymity and the confidentiality of the data.

Results

As presented in Table 1, it was found that among 150 respondents, most of the participants fall between the age of 28-37 years (47.3%), and the mean age was 38.45±7.439 Years. The majority of the respondents (86.7%) were female, and about 63.3% of them had a Diploma in nursing, followed by 30% who held B.Sc. Nursing and only (6.7%) were holders of MPH/MSc in nursing. Most of the respondents, 36.7% had less than 5 years of work experience, followed by 31.3% who had 6-10 years, 18.7% had >15 years of work experience, and 13.30% had 11-15 years of work experience (Table 1).

Table 1: Distribution of the respondents by Socio-demographic Characteristics (n=150)

Socio-demographic	Frequency	Percentage (%)
Age (years)		
≤27	2	1.4
28-37	71	47.3
38-47	53	35.3
≥48- 55	24	16.0
Mean± SD	38.45±7.439 years	
Gender		
Male	20	13.3
Female	130	86.7
Educational Qualification		
Diploma in Nursing	95	63.3
B.Sc. in Nursing	45	30.0
MPH	10	6.7
Years of work experience		
<5 years	55	36.7
6-10 years	47	31.3
11-15 years	20	13.3
>15 years	28	18.7

Table 2: Distribution of the respondents by knowledge of nosocomial infection prevention (n=150)

Variables	Frequency	Percentage (%)
Nosocomial Infections are acquired in hospital (48 hours or more after admission)		
Yes	149	99.3
No	1	0.7
The environment (air, water, inert surfaces) is the major source of bacteria responsible for Nosocomial Infection		
Yes	126	84.0
No	24	16.0
Concerning standard precaution		
Yes	146	97.3
No	4	2.7
Concerned with the recommended hygiene		
Yes	142	94.7
No	8	5.3

Concerned with the recommended hygiene		
Yes	38	25.3
No	112	74.7
The standard precautions recommend the use of gloves for each procedure		
Yes	105	70.0
No	45	30.0
Concerned wearing mask, goggles, and gown		
Yes	138	92.0
No	12	8.0
Concerned the use of alcohol -based hand rub		
Yes	140	93.3
No	10	6.7

Table 2 shows that most of the respondents (99.3%) stated that nosocomial infections are acquired in hospitals (48 hours or more after admission), and most of the respondents (84.0%) thought that environment is the major source of infection of bacteria. In addition, most of the participants (97.3%) Knew the standard precaution of the recommendations to protect the patients and the healthcare workers, and the majority of the respondents (94.7%) believed that hand hygiene is recommended as a preventive measure before or after contact with (or care of) a patient. However, only 25.0% of the participants agreed that hand hygiene is recommended as a preventive measure with patient contacts. Most of the respondents (70.0%) had known the standard precautions recommend using gloves for each procedure. In addition, most of the respondents (92.70%) knew when there is a risk of splashes or spray of blood and body fluids, and the healthcare workers must wear, mask, goggles, and gown, and 93.3% knew the use of alcohol-based hand rub instead of a traditional hand washing (the 30s).

Table 3: Distribution of the respondents that need Nosocomial Infection education program (n=150)

Variables	Frequency	Percentage (%)
Yes	136	90.7
No	14	9.3
Total	150	100.0

Table 3 shows that most of the participants wanted to attend the Nosocomial Infection education program (90.7%), and the rest (9.3%) were not interested in attending any nosocomial infection education program.

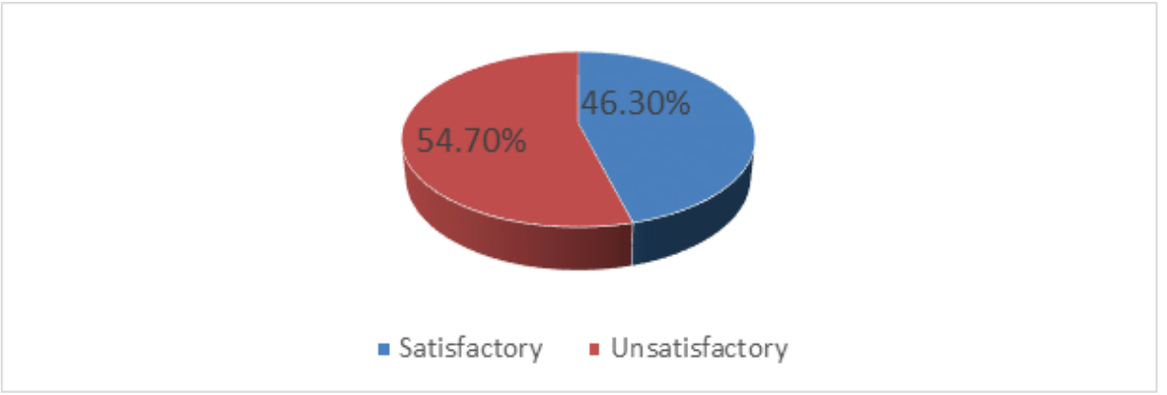

Fig. 1: Level of Knowledge Regarding Nosocomial Infection Prevention (n=150)

Figure 1 shows that about four-tenths (46.3%) of the respondents had a satisfactory level of knowledge, and the remaining (54.7%) had an unsatisfactory level of knowledge regarding nosocomial infection prevention.

Discussion

This study was carried out in order to identify the nurses' level of knowledge regarding nosocomial infection prevention. Basically, nurses are responsible for providing medications, dressing, sterilization, and disinfection. In comparison with other health care providers at the hospitals, they are much more engaged with the patients and their attendants for delivering expected care. Therefore, they are literally more exposed to various NIs[16]. Predominantly, nurses play a vital role in transmitting NIs, and their compliance with infection control interventions looks necessary for preventing and controlling the NIs[17]. Accordingly, they should be aware of preventing the transmission of NIs and be knowledgeable of its potential risks to the patients, other staffs, and the attendants. Most of the study participants belong to the age group; 28-37 years (47.3%), and the mean age was 38.45±7.439 Years. This finding is similar to the result of the studies conducted in different countries including Yemen[18], India[19], Nigeria[20], and Ethiopia[21]. The majority of the study participants (86.7%) were female, and about 63.3% had a Diploma. A similar study conducted in Yemen found that above half (61.2%) of the participants were male holding nursing diplomas (60%)[18]. Notably, most of the study participants, 36.7%, had less than five years' working experience. This is consistent with the finding of another study which reported about (43.9%) of the participants had working experience of 5 years or less[22].

In this study, about four-tenths (46.3%) of the respondents had a satisfactory level of knowledge where weak, significant negative correlation between knowledge and practice was explored in a study reporting a low level of knowledge and high level of practice regarding SSI prevention15. Some previously conducted cross-sectional studies revealed that the level of nurses' knowledge and practices were found as relatively poor and insufficient17, [23-25].

Majority of the study participants (99.3%) stated that nosocomial infections (NIs) are acquired in the hospitals (48 hours or more after admission). Notably, nosocomial infections do not occur before the

admission to the hospital18 which bears a range of instrumental effects on patients, and their attendants[18]. Aftermath of this medical phenomenon lead the patients towards morbidity, the longer stay at the hospital and the mortality as the last resort[1,26].

Conclusions

The study revealed that more than half of the respondents had unsatisfactory level of knowledge regarding the nosocomial infection prevention which is indeed alarming. It is instrumental for every nurse to have adequate level of knowledge regarding nosocomial infection and its preventive interventions. Proper maintenance of aseptic technique by trained personnel (Nurses) can significantly decline the risk of infection. Though the sample size is not large enough to come up with conclusive decisions, this study bears some insightful findings. It is suggested that different special training programs need to be arranged on a regular basis with an aim to augment effectively the level of knowledge regarding nosocomial infection prevention.

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