Assessing the Knowledge Among Nurses Regarding Nosocomial Infections/ Healthcare-Associated Infections

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Abstract:

Background: Healthcare associated infection (HAI) or nosocomial infection or hospital acquired infection is an infection that develops in the patients during their stay in the hospital/healthcare facility that may prolong their length of stay in the hospital. Healthcare associated infections affect the morbidity and mortality rates significantly. The study aimed to assess the knowledge of nurses regarding nosocomial infection.

Materials and Methods: A descriptive study design was used and data was collected from two hospitals of Lahore (provincial capital) and Islamabad (federal capital) between August 2014 to November 2014. A questionnaire was used to interview the participants (nurses).

Result: The total number of 80 nurses having different levels of qualification, experience and designation were interviewed. Five nurses out of 80 (6.25%) were found to have poor knowledge regarding HAIs, 47 (59%) nurses had average knowledge and 28 (35%) nurses had excellent knowledge about the HAIs.

Conclusion: Based on the results, it can be concluded that there is a need for the continuous education in the discipline of infection control for nurses to keep their knowledge updated. Nurses' practice in different measures of infection control must be monitored and interventions should be devised when required.

Keywords: healthcare, infections, interventions, knowledge, nosocomial

Introduction:

Healthcare associated infections (HAIs) may develop in a patient during a hospital / health care stay that was not part of the primary complaint at the time of admission (Giri, et al., 2015). Infections associated with hospitals usually occur after 48 hours of hospital admission, 72 hours after discharge or 30 days after surgery (Al-Salih, et al, 2018). HAIs are the most common adverse events that can occur in healthcare worldwide and affects the quality of care of millions of patients in both developing and developed countries each year (Geberemariyam, et al, 2018). Healthcare associated infections are a global occurrence, it develops in 7–12% of the patients in hospitals with over 1.4 million people affected by infections developed in healthcare facilities and resulting in around 80,000 deaths in a calendar year (Hassan et al, 2017). Healthcare associated infections are a global concern because of their significant impact on morbidity and mortality, leading to prolonged hospitalization and increased costs (Salem, 2019). Professionals in health care, particularly nurses are exposed to many microorganisms which can result in severe infections. Hence, nurses must have good knowledge and strict compliance to the infection control guidelines in practice (Fashafsheh, et al, 2015). Limiting HAIs, especially in healthcare facilities, is key to patient safety (Arefian, et al, 2019). Pollution of the healthcare environment with pathogenic organisms adds to the weight of healthcare associated infections. Antimicrobial surfaces are intended to decrease microbial sullying of healthcare associated infections (Muller, et al, 2016). Implementation of an effective Infection Control Program (ICP) can minimize the risk of healthcare associated infections particularly in ICUs (Hagel, et al, 2019).

Materials and Methods:

A descriptive study was conducted in different tertiary care hospitals for three months beginning August 2014 to November 2014. A questionnaire was used as the instrument of data collection.

This study was conducted in different tertiary care hospitals in the federal capital, Islamabad and provincial capital, Lahore. The nursing staff members were interviewed through a questionnaire. The staff from different units of the hospital were interviewed including the ICU, anesthesiology unit, medical and surgical units, emergency room and operation theatre. The 80 nurses were interviewed through. The participants were selected using convenience sampling method where **e**ach staff nurse was considered as a sampling unit.

A pilot study was conducted in the same study area. In this pilot study, a self-developed, closed-ended questionnaire was distributed to 16 nurses (20% of the target sample size) to determine knowledge among nurses regarding healthcare associated infections. Reliability testing yielded a Cronbach's α value of 0.81. Components of the instrument were discussed and agreed by a specialist in microbiology and academic nursing.

Nurses working in different units of the two hospitals were interviewed through pre-designed questionnaire to assess their knowledge regarding hospital acquired infections. Written permission was obtained from the Chief executive officer/Head of Department. A verbal consent was taken from each participant and the questionnaire was distributed and collected upon completion. Data for different variables like qualification, designation and total working experience was collected (Questionnaire designed to be in English language). Descriptive analysis was used to analyze the data collected.
The main limitation of the study was that nurses' practice could not be assessed by direct observation because of the time factor, so responses were made in the form of questionnaire.

Results:

The nursing staff of the participating hospitals were interviewed through a questionnaire, to assess the level of knowledge regarding nosocomial infections.

Demographic variables

Three variables were selected initially to compare the level of knowledge among nurses; 1. Qualification, 2. Current Designation, and 3. Total Clinical Experience as shown in Table 1.

Nurses' knowledge

We summed up the participants' responses to categorize their knowledge as poor, average and excellent knowledge. The following Table 2 shows that the response made by 3 nurses was poor, 76 nurses have average/fair knowledge, and 1 nurse was excellent in her response when asked to define nosocomial infections.

Table 1: Frequencies and percentage of the staff interviewed; according to their qualification, designation and work experience.

Demographic Details	Frequency	Percent
Qualification		
Bachelors in Nursing (BSN)	27	34%
Diploma of Nursing (DON)	53	66%
Designation		
Staff Nurse	70	87%
Head Nurse	10	13%
Work Experience		
0-1 Year	30	37.5%
1-3 Years	30	37.5%
3-5 Years	13	16%
> 5 Years	7	09%

Table 2: Participants' response to question; definition of nosocomial infections.

Nosocomial infections are infections which develop:		BSN		DIN		Total		
		SN	HN	SN	HN			
1	At the time of admission	1	-	2	-	3	Poor	Excellent
2	Just after discharge from the hospital until 30 days	-	-	-	1	1	Ave	
3	48 hours after admission	25	1	42	8	76	Ave	
4	30 days after discharge from the hospital	-	-	-	-	-	Poor	
Total		26	1	44	9	80		

BSN: Bachelors in Science of nursing, DIN: Diploma in nursing, SN: Staff Nurse, HN: Head Nurse, Ave: Average

Table 3. Knowledge of nurses for different variables interviewed.

No.	Variables interviewed through questionnaire	Poor	Average	Excellent
1	Definition of Nosocomial Infections	3	76	1
2	Factors Contributing to development of nosocomial infections	1	70	9
3	Susceptible Body Sites	1	20	59
4	Most prevalent organism responsible for nosocomial infections	4	68	8
5	Contributing Diseases	1	69	11
6	Diagnostic Criteria	32	29	19
7	Highly Infectious Invasive Procedures	1	13	66
8	Rodent's Role in transmitting nosocomial infections	1	33	47

Using the participant's response from Table 3 against each variable, we calculated that 5 (6%) of nurses had poor knowledge about HAIs, 47 (59%) had average/fair knowledge and 28 (35%) nurses had excellent knowledge about HAIs (as shown in Figure 1).

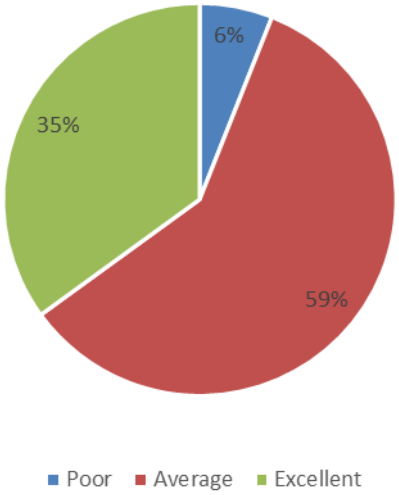

Figure 1: Nurses' knowledge regarding healthcare associated infections (HAIs).
[Note: Poor ≥50%, Average 51-79% and Excellent ≤80 %]

Results of our study showed some association between demographic variables (qualification, designation and experience) and knowledge of nurses regarding healthcare associated infections. Nurses working at higher designation and for a greater number of years were found to have fair/average and excellent knowledge.

Discussion:

The study aimed to assess the nurses' knowledge regarding nosocomial infections (development and transmission). It is significant to know how healthcare associated infections/hospital acquired infections develop. The results of this study were compared with studies published in different journals.

Based on the results of this study, 66% of the participants have a diploma in nursing and 34% has BSN degree. These results are similar to the reports of studies conducted by Jahangir et al., 2017 in Pakistan, Alrubaiee et al., 2017 in Yemen, Kaushal et al., 2015 in India and Johnson et al., 2013 in Nigeria. Regarding the designation at work, 87% of the participants were working as staff nurse which is consistent with the results reported by Alrubaiee et al., 2017 where 95.3% of the participants were staff nurses. However, 91% nurses had work experience of ≤5 years, which differs from the 56.7%, results of study conducted by Alrubaiee et al., 2017. Fashafsheh et al., 2015 found that about 43.9% nurses had work experience of 5 years or less that might correspond to high turnover ratio in hospitals in the private sector of Pakistan.

It was found that 4% of nurses were unable to define nosocomial infections correctly compared to the findings of Rolka et al. where 7.5% of respondents were not able to correctly define nosocomial infections. 56% participants responded that hands are an important source of transmitting nosocomial infections between patients and 27.5% considered use of reusable equipment as the main source of nosocomial infection regarding the factors contributing to development of nosocomial infection. Our results are comparable to the findings of Sternal et al., 2014, who found that 96% nurses acknowledged hands as the main route of communicability of pathogens and 4% recognized that it was reusable equipment. Maheshwari et al., 2014 reported similar findings where 75% respondents answered hands as the main vector for transmission of pathogens from one patient to another.

Most of respondents claimed that the agents significantly responsible for nosocomial infections are *E. coli*, *P. aeruginosa* followed by *Acincetobacter* spp. Similar data was reported by Bereket et al,, 2012 who revealed that *E. coli, S, aureus and P. aeruginosa* were the most common pathogens isolated from different body sites. As well, the majority of the participants acknowledged underlying disease as a major risk factor for nosocomial infections. These findings are in accordance with the sentence of Bereket et al., 2012 where he asserted that underlying disease like diabetes and tumours are risk factors for development of nosocomial infections.

60% of the interviewed nurses in our study stated the diagnostic criteria of nosocomial infections correctly. These results are relatable to findings of Menegueti et al., 2015. The majority of the studied nurses had good knowledge regarding the different invasive procedures like intravenous administrations and Foley's catheterization which contradicts the findings of Eskander et al., 2013 where the majority of nurses had unsatisfactory knowledge regarding intravenous administration.

In general, 6% nurses had poor knowledge, 59% had average/fair knowledge and 35% nurses had excellent knowledge regarding hospital acquired infections that was considerably higher in contrast with findings of Alrubaiee et al., 2017 where 71 % nurses had fair knowledge. This difference can be

attributed to the continuous education for nurses in Yemen in the discipline of infection control which was not investigated in this study. These results can also be compared with the findings of the study of AL-Salih et al., 2018 that reported that 84% of nurses demonstrated knowledge and concern to the definition of nosocomial infections, general information related to nosocomial infection, types of nosocomial infection and modes of transmission of nosocomial infections. Kalantarzadeh et al., 2014 reported that 41.09% nurses had fair knowledge and 26% nurses had good knowledge about nosocomial infections. Results of this study suggested some association between demographic variables like education, designation and work experience which is supported by the findings of Alwadai et al., 2018 who reported in their study that participants who underwent more training programs have good knowledge regarding healthcare associated infections and the practices required to minimize those infections.

Conclusion:

It was observed that most of the interviewed nurses had average/fair and excellent knowledge regarding healthcare associated infections/ nosocomial infections. To keep this knowledge up to date, there is a need for the continuous education in the discipline of infection control for nurses and other healthcare workers. Demographic variables like qualification, work experience and designation affects both knowledge regarding healthcare associated infection and practice limiting those infections. Therefore, nurses' practice must be monitored to evaluate their compliance to the guidelines/ standards of infection control and corrective actions must be devised when it is required.

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