GAPS IN KNOWLEDGE AND PRACTICES REGARDING NOSOCOMIAL INFECTIONS AMONG NURSING STAFF OF A TERTIARY CARE HOSPITAL OF RAWALPINDI

Imtenan Sharif, Zubaida Rashid, Naseer Alam Tariq, Syed Fawad Mashhadi, Mohi-ud-Din, Larayeb Wazir, Muhammad Ammar Dogar, Yahya Asif, Aqsa Jadoon

Army Medical College/National University of Medical Sciences (NUMS) Rawalpindi Pakistan

ABSTRACT

Objective: To assess the gap in knowledge and practices regarding the nosocomial infections among nursing staff of Military Hospitals of Rawalpindi.

Study Design: Cross-sectional analytical study.

Place and Duration of Study: A 2500 bedded Military Hospital affiliated with National University of Medical Sciences and study duration was one year, from Jan 2018 to Dec 2018.

Methodology: A structured pre-tested questionnaire was given to 377 participants which consisted of nursing staff and nursing assistants. Study was started after getting approval from the ethical committee. Data was analyzed using SPSS version 25.

Results: Study participants consisted of 66.8% males and 33.2% females. The mean age of study participants was 26.99 ± 5.79 years. Median work experience of our study population was 4 years ranging from 1 to 33 years. The mean knowledge score of our study population was 79.94 ± 20.67 with male participants having better knowledge than their female counterparts (*p*-value=0.011). The practices of our study population were poor with mean score of 59.31 ± 16.5. Female participants (62.24 ± 17.68) though had better practices then male participants (57.86 ± 15.72) with statistically significant difference (*p*-value=0.015).

Conclusion: Healthcare workers were found to have adequate knowledge regarding hospital acquired infections, but their prevention practices were not in line with their knowledge and not satisfactory.

Keywords: Health care workers, Hospital acquired infections, Hand washing, Nosocomial infections, Nursing staff.

INTRODUCTION

Infection control is vital in health care facilities to prevent hospital acquired infections (HAI). HAI occurs when a patient acquires infection at the facility which was not present at the time of admission[1]. HAI become clinically evident after 48 hours of admission or an infection appearing after the patient is sent home from the facility. Main cause of preventable morbidity and mortality is HAI in the developing countries due to poor infection control practices[2]. Studies have reported that 7 to 12% of hospitalized patients are affected with HAI worldwide with more than 1.4 million people and a resultant estimated annual death of 80,000. The estimated HAI rate in developing counties is said to be at 25% which can be decreased drastically with safe practices[3].

World Health Organization (WHO) estimates that around 7.1 million cases of HAI occur every year with 1 out of every 20 people suffering due to poor practices with an estimated cost of 32 million dollars per year which easily can be prevented[4]. HAI not only add to the misery of the patients but also overburden the economy of the state as well. Health care workers should have safe practices which can prevent the spread of HAI[5]. WHO has formulated guidelines to reduce the prevalence of health care associated infections. Despite having these guidelines, compliance with safe practices is poor and lacking which is responsible for the spread of nosocomial infections[6].

Most of the HAI (40%) are attributed to the cross infection of healthcare work hands after

Correspondence: Dr Imtenan Sharif, Community Medicine Dept, Army Medical College Rawalpindi Pakistan
Email: imtenansharif@gmail.com
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encountering contaminated surfaces. Common medical and non-medical tools in a healthcare facility have all shown to harbor microbes[7]. A study reported that bacterial colonization of stethoscopes and otoscopes are one of the main reasons of HAI respectively. Although the concentration of pathogens on the inanimate surfaces of a healthcare facility is significantly low as compared to that of a skin of an ill patient, the high virulence and infection of these hospital acquired pathogens means that a much lower dose of these infectious agents is enough to cause significant disease.

Most frequent and common causes of HAI is the surgical site infection (30%) followed by urinary tract infection (22%), lower respiratory tract infection (15%) and bloodstream infection (13%) respectively. Prevalence of nosocomial infections is high in critical care units (25%) than in medical (9%) and surgical wards (12%). The most common pathogen strains in health care setups reported are gram negative bacilli. There is also a significant relationship reported between age, intubation and tracheostomy with the rate of HAI[8].

Prolonged stay in hospitals along with overcrowded facilities are the main reasons for HAI. Pakistan does not have good basic healthcare services. A study reported 20.8% of patients have to wait in the emergency section of the hospital for more than 6 hours. The main factor of delay is the unavailability of the beds followed by some other reasons. The risk of HAI can be decreased with minimal stay in the hospital, avoiding the overuse of antibiotics and reuse of suction catheters, and hand washing by health care personnel and; by using proper aseptic sterilization in therapeutic procedures. Nurses as member of health care team can play very important role in the prevention of HAI. Nurses must have enough information and skills in the field to successfully control the HAI[9]. It is essentially the duty of the nursing staff and everyone in the hospital to ensure that the patients that come in the hospital for treatment or admission are taken good care of and return to their homes as soon as possible without getting any infection from the hospital whether it may be from other patients, unsterilized hospital equipment or due to the gaps in the practices of the nursing staff themselves[7].

It is important to understand that control and preventive strategies to HAI must be implemented consistently and rigorously. Among the different strategies is the adherence to guidelines for disinfection and activities aimed at preventing HAI. Accordingly, nursing staff have a critical role to play in prevention efforts and it is important to assess the knowledge, attitudes and practices of nurses. Consequently, the objective of this study was to assess the level of knowledge and perceptions regarding the HAI and gaps in practices towards their prevention in a tertiary care hospital of Rawalpindi.

METHODOLOGY

This was a cross-sectional analytical study conducted on the nurses of tertiary care hospitals affiliated with National University of Medical Sciences of Rawalpindi. Study was conducted for the duration of one year after getting ethical approval from the local ethical committee. Consent was obtained from study participants as per declaration of Helsinki[17]. A sample size of 377 nurses and nursing assistants were enrolled in the study using nonprobability convenience sampling with 5% margin of error and 95% confidence interval[18]. Nursing staff with less than one-year experience were excluded from the study. A validated questionnaire of hand hygiene and infection control for health care workers was used to study the, knowledge and practices among the study participants. The questionnaire included questions regarding knowledge and practices of hand hygiene and infection control. Score more than or equal to 80 as good, score ranging from 60 to 79.9 was considered as average and score less than 60 was considered as poor respectively. Data was analyzed using SPSS version 25. Mean and standard deviation of quantitative data was determined while frequencies and percentages were calculated of categorical data. To compare scores

between two independent variables such as gender, profession, work experience; independent sample t-test was applied while comparisons of scores between 3 groups (Surgery, Medicine, OBGYN wards), one-way ANOVA was applied. A *p*-value ≤0.05 was considered statistically significant.

RESULTS

A total of 377 nurses and nursing assistants were interviewed with 252 (66.8%) males and 125 (33.2%) females respectively. The mean age of the participants was 26.99 ± 5.79 years. Our study participants had median work experience of 4 years. Other demographic characteristics (table-I).

The overall knowledge and practices score of our study participants were 79.94 ± 20.67 and 59.31 ± 16.5 respectively. Male participants had better knowledge scores (81.8± 21.15) than their female counterparts (76.2 ± 19.21) (table-II). However, their practices (57.86 ± 15.72) were not in line with their knowledge scores. Females had better practices (*p*-value<0.05) than males.

There was no significant difference in knowledge scores between nurses and nursing assistants (table-II) however, there was a significant difference (*p*-value=0.002) with nurses having better practices. Participants who had work experience of 5 years or more had better

Table-I: Demographic characteristics of study participants and score categorization.

Variables		Frequency	Percentage
Gender	Male	252	66.8
	Female	125	33.2
Nursing Staff	Nurses	116	30.8
	Nursing Assistants	261	69.2
Work Experience	Less than 5 years	207	54.9
	More than 5 years	170	45.1
Immunization Status	Yes	310	82.2
	No	67	17.8
Hospital Ward	Surgery Ward	102	27.1
	Medical Ward	173	45.9
	Gynecology Ward	102	27.1
Knowledge of participants	Good knowledge	211	56
	Average knowledge	97	25.7
	Poor knowledge	69	18.3
Practices of participants	Good Practices	80	21.2
	Average practices	52	13.8
	Poor Practices	245	65

Table-II: Knowledge and practices scores of study participants. Independent sample t-test applied to find out differences between 2 groups.

Independent variables		Frequency	Knowledge of participants		Practices	
			Score ± SD	*p*-value	Score ± SD	*p*-value
Gender	Male	252	81.8 ± 21.15	0.011*	57.86 ± 15.72	0.015*
	Female	125	76.2 ± 19.21		62.24 ± 17.68	
Profession	Nurses	116	78.02 ± 18.4	0.201	63.19 ± 18.25	0.002*
	Nursing Assistants	261	80.8 ± 21.58		57.59 ± 15.39	
Work Experience	<5 years	207	79.59 ± 20.65	0.717	57.63 ± 16.66	0.029*
	≥5 years	170	80.37 ± 20.75		61.35 ± 16.13	
Working in**	Surgery ward	102	89.46 ± 16.85	<0.001*	58.14 ± 14.94	0.489
	Medical Ward	173	74.71 ± 21.05		59.19 ± 16.44	
	Gynecology Ward	102	79.29 ± 20.32		60.69 ± 18.09	

*p-value significant, **One-way ANOVA applied to determine difference between 3 groups.

knowledge and practices (table-II). Participants working in the surgery and gynecology ward had better knowledge with participants working in the medical ward (*p*-value=0.001). The was no significant difference in practices though. Overall, 56% (211) participants of our study had good knowledge and only 21.2% (80) had good practices (table-I). A shocking 65% (245) of the participants had poor practices though having adequate knowledge.

DISCUSSION

Globally, HAI or nosocomial infectionsare one of the most complex and serious health issues. The need for effective infection control programs is needed due to the emergence of various life-threatening infections in all health care facilities; and capacity building for health care workers to stop the transmission of pathogens within these facilities[10-16]. This study revealed interesting findings regarding the knowledge and practices among a sample of nursing staff in a single 2500 bed tertiary care setup of Rawalpindi. Though study participants had adequate knowledge (79.94 ± 20.67) but their practices (59.31 ± 16.5) were not in line with their knowledge scores. These findings were in line with a similar study conducted at another hospital in Rawalpindi and Faisalabad where 90% of the respondents had good knowledge about nosocomial infections but had poor practices[17-20]. However, a study in Iran reported 43% of the participants having inadequate knowledge regarding hospital acquired infections[4].

When asked about sources of information, 72.3% identified medical professionals assource of knowledge about precautionary practices to prevent nosocomial infection spread, 21.2% participants said they gained information through seminars and workshops while 6.9% identified websites as their source of information. When presented with a list of various educational sources, Sessa *et al* reported that the preferred method for acquiring information for the participants was workshops/seminars and continuing medical education (71.8%), followed by guidelines (26.9%) and medical journals (23.2%)[21].

In our study, however, it is noticeable that the sample preferred on ground practice and the knowledge they gained by observing medical professionals as a source of information. About 88.6% of the participants believed that education of the staff can help reduce the risk of spread of infection. Recommended time for hand washing was correctly identified by 73.7% of study participants.

Suchitra *et al* reported that training had a positive impact on the improvement of practices and the development of continuous training programs for all healthcare workers was a necessity[4]. Elliott *et al* concluded that regular training courses have effectively promoted knowledge and practices of healthcare personnel in the UK. Continuous training and knowledge improvement, besides the use of appropriate and effective methods of disinfection and sterilization, will reduce the frequency of developing HAI[6].

The most important point that our study highlighted was the lack of safe practices. The results of a similar study conducted at Fauji Foundation Hospital also documented poor practices[20]. There could be multiple reasons that deter people from doing safe practices such as not wearing gloves due to allergies, skin dryness; or lack of knowledge or maybedue to high workload[22]. Our study however reported that 79.3% of study participants washed their hands after attending a patient. A study in Gujarat, India showed 56% participants washed their hands after attending patients[23].

It must be accepted that HAI cannot be eradicated entirely, whenever multiple patients are taken care of at one place, they are highly susceptible to pathogens. They are likely to catch infections. Hospital administrators should provide visible support and enough innovative, educational, and motivational programs that are tailored to health care workers[6,24]. It is established that one third of the HAI are preventable and that about 90% of the deaths from hospital infections

can be prevented by strictly following the guidelines.

LIMITATION OF STUDY

Our data was collected from selected departments of a tertiary care hospitals of Rawalpindi only. Thus, the conclusions and results drawn from it were less wholesome in comparison to results obtained from a multi-centered study giving an overview of the practices of hospital staff in the entirety of tertiary care set ups. Structured interviews create quantitative data and hence a lack of detail can be formed, this implies the interviewer won't know why a candidate behaves in a particularway. In addition, this type of data collection method creates a bias and data lacks validity to a certain degree as the candidates may try to impress and act free of mistakes.

RECOMMENDATION

Prevention of HAI includes taking care of healthcare workers. Proper and complete sterilization of medical equipment and providing a sanitary environment through timely waste disposal. Education of nursing staff through seminars, workshops, social media, print media regarding the implementation of hospital safe practices. Providing a safe sterile environment for immunocompromised patients and carrying out necessary preventive measures before any invasive therapeutic or diagnostic procedure. Making an adequate effort at Hospital level to encourage the use of sterile gloves, drapes, masks, and personal protective equipment.

CONCLUSION

Our study population had adequate knowledge regarding HAI; however, in the assessment of gaps between knowledge and practices of the participants, the study found a deficit in the habit of practice and unsatisfactory knowledge implementation. This study highlights the need for conducting training on infection control and prevention along with continued medical educational seminars/workshops with strict monitoring and supervision.

CONFLICT OF INTEREST

This study has no conflict of interest to be declared by any author.

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