

# Training Needs Assessment for Nosocomial Infections Among Nursing Staff: A Gap Analysis

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## ABSTRACT

Hospital acquired infection (HAI) is an infection that develops in a hospitalized patient that was not present or in incubation at the time of admission. Such an infection may become evident during the patient's stay in the hospital or after discharge. Thus, HAIs are a major health problem. Nurses being in direct contact with the patients round the clock, performing various nursing procedures and assisting physicians and surgeons in various procedures play an important role in preventing and controlling HAI. Hence, there is a need to assess the existing knowledge and practice of nursing staff towards infection control measures. This cross sectional study was carried out at a tertiary care hospital of Nagpur, India during the March 2013 – May 2013. Total of 125 registered staff nurses were given a standard questionnaire about HAI. 43.2% of the nurses were able to correctly define HAI. There was 100% awareness about methods of disinfection. Although defining HAI and HICC was difficult (43.2%, 16.8%), the awareness of HAI ranged between 75.2% to 99.2%. PEP practices were generally well known (95.2% to 100%), but knowledge about measures following blood spills was low (46.4%).

**KEY WORDS:** hospital acquired infection (HAI), nursing practice, post exposure prophylaxis (PEP), universal precautions, waste disposal, hospital infection control committee (HICC)

## INTRODUCTION:

Hospital acquired infection (HAI) is an infection that develops in a hospitalized patient that was not present or in incubation at the time of admission. Such an infection may become evident during the patient's stay in the hospital or sometimes after discharge. The incidence of hospital infections is 2-12% in advanced countries and is presumably higher in developed countries<sup>[1]</sup>. Today, hospital infections occur in 5% patient's admitted to the hospitals (affecting 1.7 million patients each year)<sup>[2]</sup>. Thus, HAIs are a major health problem<sup>[3]</sup>. They cause serious morbidity, mortality and increased health costs throughout the world<sup>[4]</sup>. The World Health Organization (WHO) report estimates that 2.5% of

HIV and 40% of HBV is a result of occupational exposure<sup>[5]</sup>. Thus, stringent implementation of infection control measures is necessary.

Detection of risk groups and infection sources, knowing the routes of transmission of infections and educating patients and the hospital staff responsible for their care are important for the prevention of HAI<sup>[4]</sup>. Nurses being in direct contact with the patients round the clock and performing and assisting physicians and surgeons in various procedures have an important role in preventing and controlling HAI<sup>[3]</sup>. They play a pivotal role in preventing hospital-acquired infections (HAI), not only by ensuring that all aspects of their nursing practice is evidence based, but also through nursing research and patient education. They are in a unique position to affect change to improve patient care standards<sup>[6]</sup>. Therefore, a high degree of awareness, knowledge and skill in nursing practice is essential to prevent HAI.

Hence, this study aimed to assess the levels of knowledge and practice of nurses about infection control measures.

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## MATERIALS AND METHODS:

This cross sectional study was carried out at a NKP Salve Institute of Medical Sciences and Research Center, Nagpur during March 2013 to May 2013. Approval by the institutional ethics committee was obtained before the start of the study.

All registered staff nurses working in medical and surgical wards and intensive care units (153) were given a standard questionnaire about HAI. Of these, 125 completed the questionnaire and were included in the study.

A standard questionnaire was developed and administered to each registered participating nurse and a completed questionnaire was collected back. The correct answers to each question were based on review of the available literature and guidelines.

The data was obtained from the returned completed questionnaire was entered into Microsoft excel and analysis was done. The statistics was done by percentage analysis method and results were obtained.

## RESULTS:

All (125) of the nurses believe that a health care worker is at risk of acquiring HAI. Out of them 88% knew to discard a lab request form if it is soiled and 75.2% knew what to do when specimen containers are soiled from outside. However, only 16.8% knew what HICC stands for (Table 1). It was found that 96.8% of the nurses could correctly identify the infectious materials from the patients and 99.2% knew the recommendations for care of patients known to harbor blood borne pathogens, whereas only 62.4% knew not to recap a needle before disposing by cutting (Table 2). All nurses knew about the common skin disinfectants and when to use them and 93.6% nurses knew about the methods of sterilization of the OT but only 53.5% knew when to change the dressing of central IV line patients.

All 125 nurses (a) felt that it is necessary to segregate and categorize waste before disposal and all knew about the categories of waste disposal; (b) knew how to discard syringes and needles; and (c) 97.6% knew how to dispose infected material from the patients.

Eighty eight percent of the nurses felt that waste disposal is the responsibility of everyone working in the hospital, while, 8%, 2.4% and 1.6% thought that it was the responsibility of nursing staff, the management and the doctors respectively (Figure 1).

There was 100% awareness about hand washing. However, not all of them felt that it is practiced uniformly. Whereas 77.6% nurses felt that hand washing was done uniformly, while 22.4% felt that not everyone practices it regularly (Figure 2).

Whereas 90.4% of the nurses consider universal precautions to be compulsory and 9.6% consider them to be protective. Only 76.8% of the nurses think that universal precautions should be followed for every patients at all times and 21.6% think that they should be followed only for HIV patients. But 1.6% followed universal precautions only in the operation theatre, as shown in (Figure 3).

Only 67.2% of the nurses consider all patients to be able to cause infections and 75.2% consider all blood and body fluids to be infectious and all (100%) consider all unsterilized needles and sharps to be contaminated (Figure 4).

## DISCUSSION :

In this study, 43.2% nurses gave correct definition of HAI. All nurses (100%) felt that a health care worker (HCW) is at the risk of acquiring HAI. These findings were similar to the study of Samaila *et al* where 57.5% gave correct definition of HAI and 72% were of the opinion that improper aseptic technique and contamination of health care worker is one of the common risk factor for HAI<sup>[7]</sup>. This was different from a study conducted in Turkey where only 54.2% of the hospital cleaning staff thought that they were vulnerable to HAI<sup>[4]</sup>. This was probably because in that study, the knowledge of cleaning staff is taken into consideration, whereas knowledge of nurses was assessed in our study. However, it was surprising that only 16.8% knew what HICC stands for. In a study done by Adriana *et al*, 88% of the professionals had knowledge of the meaning of the acronym HICC<sup>[8]</sup>. This is because, in the latter study, all health professionals were included, whereas, only nurses participated in our study. This also shows that even though the nurses were aware of the risk of HAI, they were not aware about the committees for its prevention. In a study done by Hamed *et al* only 22% of nurses had good knowledge about HAI<sup>[9]</sup>.

It was reassuring that 100%, 96% and 95.2% nurses knew the correct post exposure prophylaxis for needle stick injury, mucosal exposure and non intact skin exposure respectively. While, study done in Germany showed that only 38.8% staff reported to proper authorities after needle stick injury<sup>[10]</sup>.

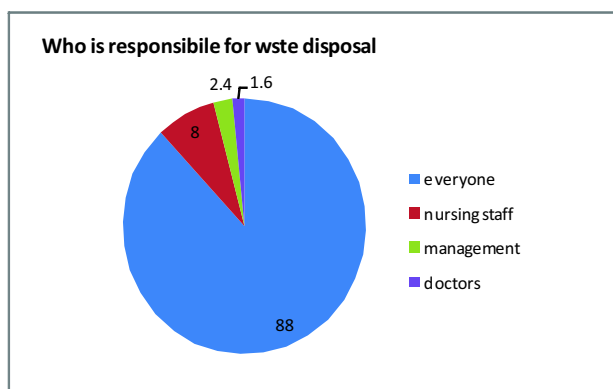
In this study, 62.4% nurses felt that needles should not be recapped before disposal. This was

**Table 1** : Knowledge of nurses about hospital acquired infections.

Question	correct response (%)
What is HAI	43.2
What are the common organisms causing HAI	62.4
Which are the common type of HAI	76
Which patients are more prone to HAI	78.4
What is outbreak of an infection	76.8
What to do when specimen containers are soiled from outside	75.2
What to do when lab request forms are soiled	88
What are the measures to avoid HAI	99.2
What is HICC	16.8

**Table 2** : Responses for practices related to prevention of infections.

Question	correct response (%)
Measures following a blood spill	46.4
Precautions while suctioning	82.4
How to collect urine sample from catheterized patients	87.5
PEP for needle stick injury	100
PEP for mucosal exposure	96
PEP for non intact skin exposure	95.2
Name the potentially infectious material from patients	96.8
What are the recommendations for care of patients known to harbor blood borne pathogens	99.2

**Figure 1**: TNA: Responsibility for waste disposal.

similar to the study done by Yamini *et al*, where 75.8% were aware that needles are not to be recapped<sup>[5]</sup> and

another study in Turkey where 73% of the HCW did not recap the needles after use<sup>[4]</sup>.

It was observed that 93.6% nurses knew the methods of sterilization of the OT. However, only 53.6% knew when to change the dressing of central IV line patients. This discrepancy in the practice could be due to the fact that not all the nurses were stationed at the wards and other service facilities where such patients were present.

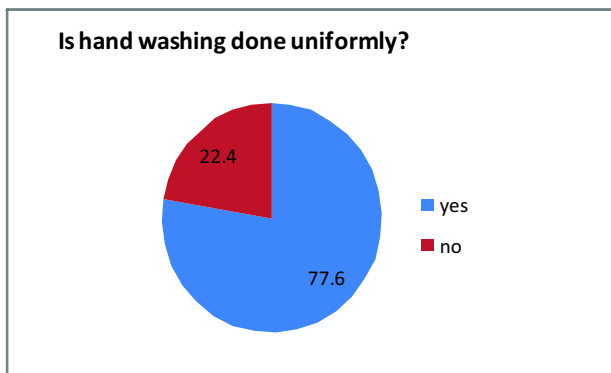
All the nurses knew about the importance of hand washing and how it would help to prevent the spread of infection although 22.4% stated that hand washing is not done uniformly. Similarly, in a study done in Turkey, 80.8% stated that they obeyed hand washing rules<sup>[4]</sup>. Another study done by Saidani *et al* in France showed that 80% of the HCW were practicing hand washing rules<sup>[11]</sup>. Compliance with hand washing

**Table 3:** Cent percent correctly responded questions.

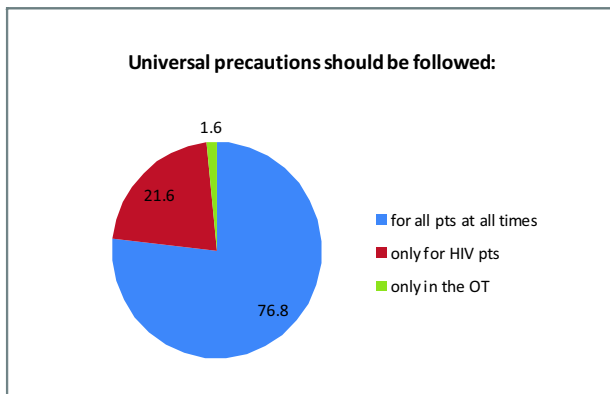
Health care worker is at risk of acquiring HAI
It is necessary to categorize and segregate waste before disposal
Hand washing is necessary and would prevent spread of infection
Name the common skin disinfectants and where they are used
Awareness about universal precautions

was moderate in a study done by Pittet *et al* [12]. However, a study by Yamini *et al* and another study in Baltimore showed that the nurses' knowledge was higher, but their practice was poor with regards to hand washing [5]. This difference could be due to the fact that ours was only a questionnaire based study and the actual practice was not documented. Our findings also differ from study done by Hamed *et al* where highest levels of knowledge was about hand hygiene (74.5%) and precautions to avoid needle stick injuries(70%) [9]. All (125) the nurses were aware about the universal precautions. This finding was similar to a study done by Gershon *et al*, where the compliance to universal precautions was maximum among nurses when compared to other HCWs [13]. It was seen that 90.4% nurses felt that universal precautions should be compulsory and 9.6% felt that they were protective. Compared to this, in a study by Suchitra *et al*, 60% felt that universal precautions are compulsory and 72% felt that they were protective [14]. This difference could be because only a single answer was selected to this question in our study.

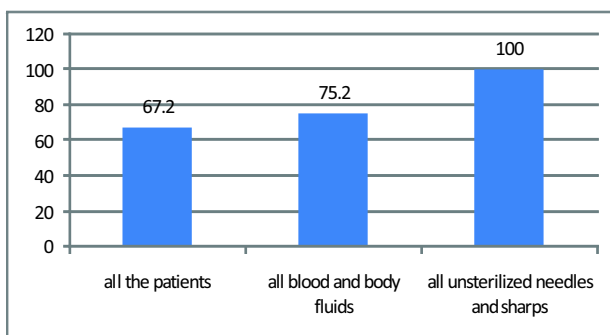
In this study, 76.8% felt that universal precautions should be followed for all patients at all times. This was similar to findings in a study by Aarti *et al*, where 76% felt so [3].



**Figure 2:** TNA: Hand washing.



**Figure 3:** TNA: Universality of universal precautions.



**Figure 4:** TNA: Sources of HAI.

**CONCLUSION:**

The study concludes that nurses in our study were aware of the universal precautions, hand hygiene, waste disposal and disinfection. However, their knowledge about the subject of hospital acquired infections was found to be poor.

**IMPLICATIONS OF STUDY:**

We can use this assessment for the betterment of knowledge and practice related to HAIs. We can undertake capacity building activities of nurses after understanding their training needs.

### LIMITATION OF STUDY:

Assessment and evaluation of observed practices for prevention of HAIs was not included of in the scope of this study.

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