

Knowledge of Theory and Practice of Infection Control Among Nursing Staff Working in a Tertiary Care Hospital

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ABSTRACT

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Background: Healthcare associated infections (HAIs) are one of the most common complications of health care management. Effective infection prevention and control in healthcare facilities depends on the proper implementation and practice of policies and procedures on infection control as well as awareness and compliance of healthcare workers regarding the same. There arises a need to ensure strict measures of infection control among nursing staff since they are front-line workers in the ongoing struggle against the COVID-19 pandemic. This study was conducted to assess the knowledge of theory and practice of infection control among the nursing staff working in the hospital outpatient departments, wards, operation theatres, and intensive care units of a tertiary care hospital.

Materials and Methods

- Type of study: Cross-sectional study
- Study participants: Nursing staff working in a tertiary care hospital
- Duration of study: 2 months
- Inclusion criteria: At least one year job experience and a bachelor degree
- Exclusion criteria: Reluctance to participate

To conduct the survey, permission was obtained from the Ethical Committee of the Institute.

A questionnaire was distributed among the nursing staff working in the hospital outpatient departments, wards, operation theatres, and intensive care units.

The data was entered into an Excel sheet and the scores were tabulated in percentage.

Results: The results of the study show that the nurses in the present study have excellent knowledge regarding the theory of infection control. However, their overall knowledge of practice didn't reach an excellent level. It was also seen that the knowledge of practice improved with experience. In regards to place of activity, the highest scores of knowledge of both theory and practice were seen in the operation theatres and intensive care units.

The study reported no relationship between knowledge of theory or practice of infection control and the age and educational qualification of the study participants.

Conclusion: The overall high knowledge levels may be attributed to the active working and monitoring of the Hospital Infection Control Committee. Factors like years of experience and place of activity had a positive correlation with higher scores while factors like age and educational qualification had no significant correlation with knowledge levels.

Keywords: Infection control, Knowledge and Practice, Nursing staff

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INTRODUCTION

The roles and responsibilities of a nurse with regards to infection prevention and control roughly fall under the following categories: carrying out sterile procedures, sample collection and biomedical waste

management¹⁻² (**Figure 1**). Nurses are often exposed to various infections during the course of carrying out their nursing activities.³ Many infection control measures, such as appropriate hand hygiene and the correct application of basic precautions during invasive procedures are simple and of low-cost, but require staff

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Table 1. Regarding knowledge of theory of infection control among nursing staff

Question	% of respondents who answered 'Yes'
Do you have infection control programme at your institute?	96.5
Do you have infection control policy in your unit?	89.7
Do you have infection control guideline in your unit?	90.5
Have you at any time received training or orientation about infection prevention and control?	98.2
Do you think the staff in your unit are promptly following infection control policies, rules and guidelines?	79.4

Question	% of respondents who answered correctly
The single most important measure for preventing healthcare associated infections is hand hygiene	98.2
Immunisation against Hepatitis B is a standard precaution	98.2
Sterilisation is a process of killing of microorganisms including spores	93.1
Correct technique for drying hands after surgical hand washing is rotatory motion from finger to elbow using sterile towel	84.6
Following a procedure, handwashing is necessary after removing gloves	96.5

Table 2. Regarding knowledge of practice of infection control among nursing staff

Question	% of respondents who answered 'Yes'
For absolute sterilisation of the OT instruments which is the ideal method?	91.4
Alcohol based hand rubs have good or excellent antimicrobial activity against all of the following except Viruses, Fungi, Gram negative bacterial, Bacterial spores	5.98
Alcohol-based hand rubs are indicated for all of the following clinical situations except	52.1
Which of the following is the first priority in preventing infections when providing care for a client	80.3
Which is the proper way of disposal of used needles and sharp materials?	52.1
The appropriate concentration of available chlorine to decontaminate spillage of blood	27.3
Which of the following is considered medical waste	38.4
Proper disposal of medical waste	74.3
Most important step in managing biomedical waste	22.2
Which colour coding bag should be used to discard I.V set and empty bottles in the ward?	93.1

accountability and behavioural change, in addition to improving staff education, reporting and surveillance systems.⁴ Most nosocomial infections are transmitted by health care personnel who fail to practice proper hand washing procedures or change gloves between client contacts.⁵ Compliance on the part of healthcare workers with standard precautions has been recognized as an efficient and effective means to prevent and control health care associated infections in patients and healthcare workers.⁶⁻⁷

Efforts at preventing healthcare associated infections in hospitals remain an ongoing and difficult challenge in the medical care settings in India. In the background of the ongoing COVID-19 pandemic, it is of utmost importance to minimize the risk of spread of infection to patients and staff in hospital by implementing good infection control programme.

This study was conducted to assess the knowledge of theory and practice of infection control among the nursing staff working in the hospital outpatient departments, wards, operation theatres, and intensive care units of a tertiary care hospital.

AIMS AND OBJECTIVES

1. To assess the knowledge of theory of infection control among nursing staff
2. To assess the knowledge of practice of infection control among nursing staff
3. To determine a relationship between knowledge of theory and practice and other factors such as age, educational qualification, years of experience and place of activity

MATERIALS AND METHODS

The study was a cross-sectional study conducted among the nursing staff working in a tertiary care hospital. The study was conducted for a duration of two months in a 1400 bed hospital where around 800 nursing staff are presently working. The nursing staff was sensitized with the study and among these around 234 nursing staff were included as the study population through convenience sampling. All the participants were informed about the purpose and method of study. They were also informed that participation in the study was voluntary. The inclusion criteria in the study was at least one year job experience and a bachelor degree. The only exclusion criterion was reluctance to participate in the study. To conduct the study, permission was obtained from the Ethical Committee of the Institute.

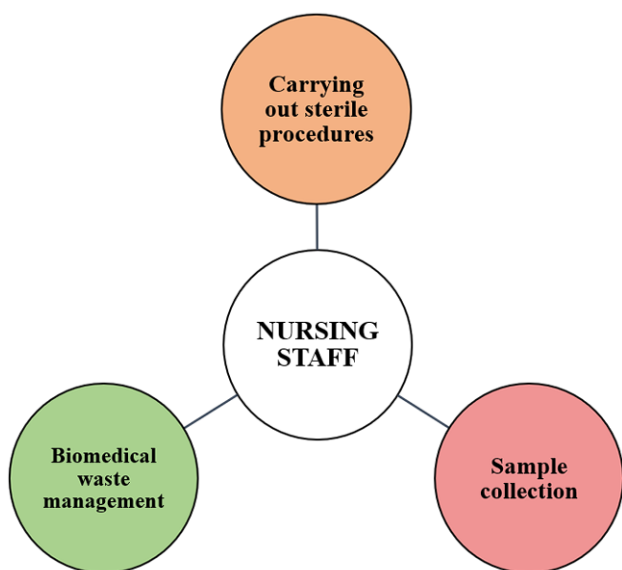


Figure 1. Roles and responsibilities of Nurses in regards to Infection Control

The nurses were divided into three categories based on their nursing experience; junior nurses (0-5 years), nurse in-charges (5–8 years) and nursing supervisors (>8 years). A self-reported questionnaire was distributed among the nursing staff working in the hospital outpatient departments, wards, operation theatres, and intensive care units. The questionnaire was validated amongst 10 infection control nurses working in the hospital and was translated to the local language of the respondents.

The questionnaire consisted of three parts;

Part - A consisted of Sociodemographic Data (including gender, age, educational qualification, years of experience and place of work)

Part - B consisted of 10 questions regarding knowledge of theory of infection control and

Part - C consisted of 10 questions regarding the knowledge of infection control practices performed in day to day duty in the hospital.

The questionnaire consisted of standard precautions of infection control such as hand hygiene, use of personal protective equipment (PPE) including gloves, aprons, masks, handling of sharps injuries, management of blood and body substance spillage and biomedical waste management.

The data was entered into an Excel sheet and the scores tabulated in percentage.

RESULTS

Of the 234 participants to whom questionnaires were distributed, all were selected for analysis. The mean age of the participants was 28 years and the mean duration of employment was 5 years. Distribution of female to male nurses was in the ratio 12:1.

Distribution of staff according to years of experience was: 158 nurses with 0-5 years of experience, 22 nurses in charge with 5-8 years of experience and 54 senior nursing staff/ supervisor with more than 8 years of

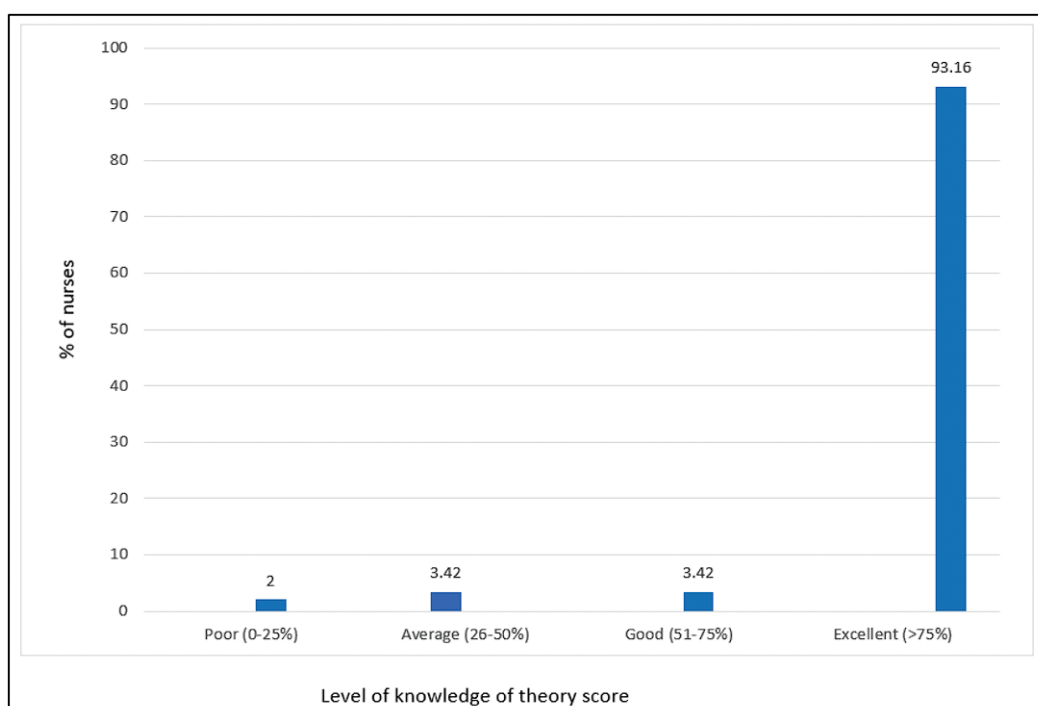


Figure 2. Distribution of nurses according to level of knowledge of theory score

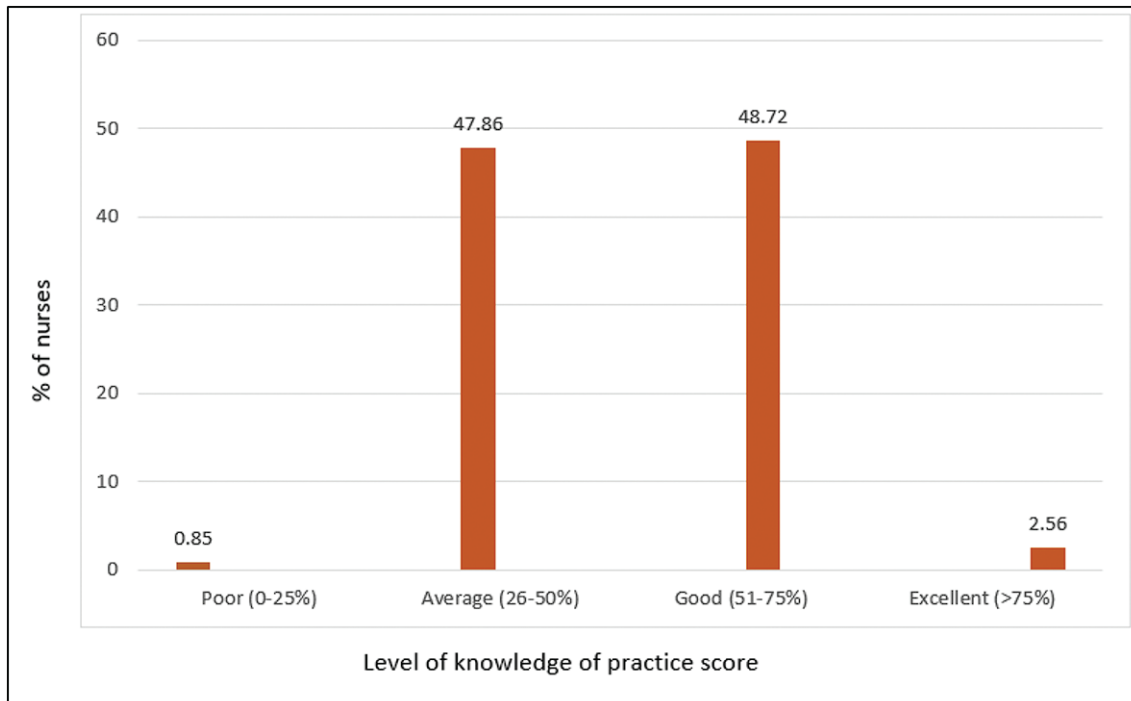


Figure 3. Distribution of nurses according to level of knowledge of practice score

experience.

The questionnaire consisted of two sets comprising of 10 questions each related to knowledge of theory and practice of infection control. Each correct answer was scored 1 and each wrong answer scored zero. The scores were calculated in percentage and categorized as poor (0-25%), average (26-50%), good (51-75%) and excellent (>75%).

the 234 nursing staff that participated in the study, 93.16% of the study population had excellent knowledge about the theory of infection control (**Figure 2**) while levels of knowledge of practice ranged from good to average in majority of the participants (96.58%) (**Figure 3**). The results showed that while there was an overall excellent level of knowledge of the theory of infection control, the overall knowledge of practice of the same remained good to average.

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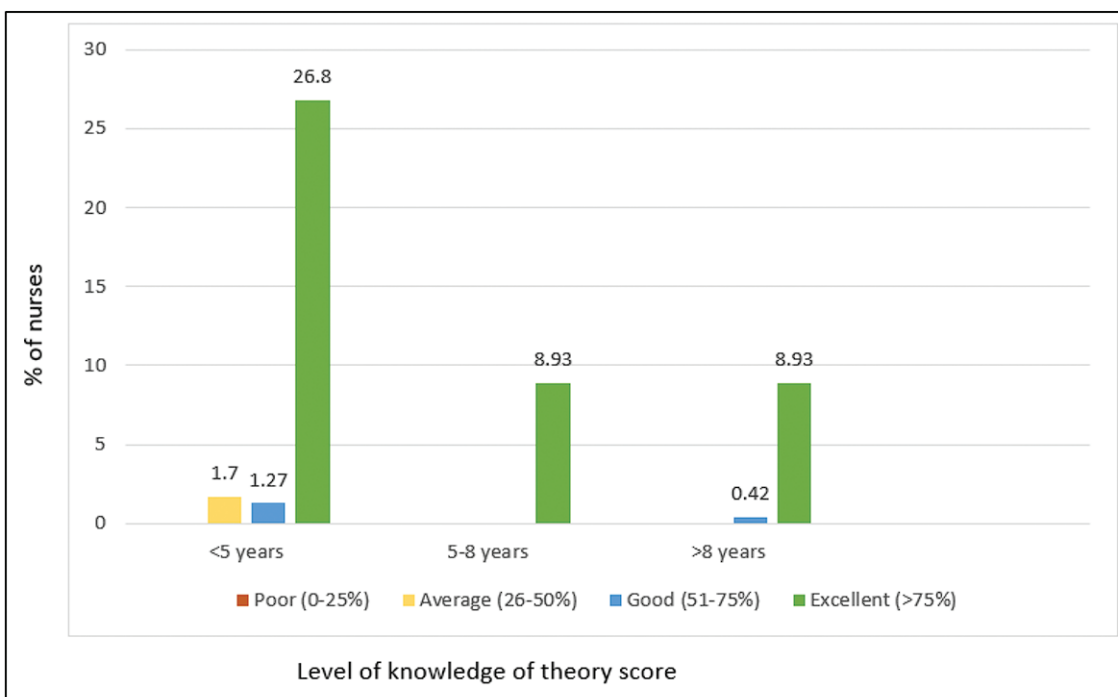


Figure 4. Distribution of nurses according to years of experience and level of knowledge of theory score

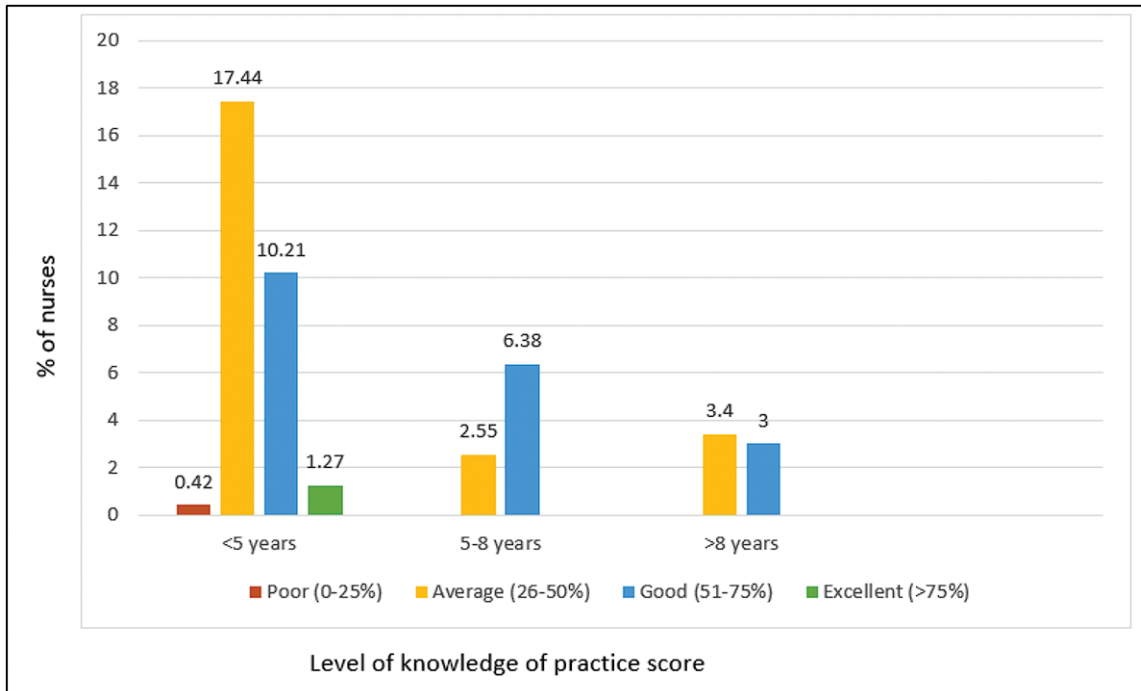


Figure 5. Distribution of nurses according to years of experience and level of knowledge of practice score

While the majority of participants had excellent knowledge of theory irrespective of their years of experience, (Figure 4) the knowledge of practice was mostly average (17.44%) among those with <5 years of experience while it was mostly good in those with >5 years of experience. (9.38%) However, 1.27% of the junior nurses had excellent levels of knowledge of practice while none of the senior nurses had excellent scores (Figure 5).

Distribution according to place of activity was done as following; wards, outpatient departments (OPD), operation theatres (OT), intensive care units (ICU), Labour room and others (Blood Bank, Central Clinical

Laboratory, Endoscopy, Immunisation clinic). It was found that while overall levels of knowledge of theory were excellent (47.2%) (Figure 6), the levels of knowledge of practice were good to average in majority (44.64%). Furthermore, the knowledge of theory and practice levels was best in OTs and ICUs (Figure 7).

DISCUSSION

This study was conducted on nursing staff from various departments including blood bank and central clinical laboratory to assess their knowledge of theory and practice of infection control. Similar studies conducted in the past have focused on nurses from

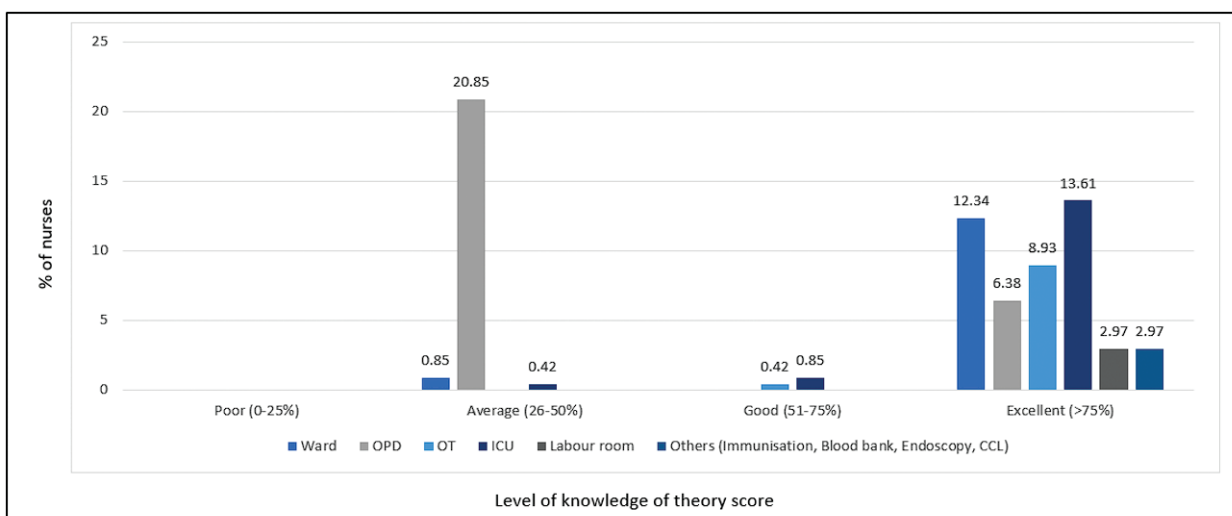


Figure 6. Distribution of nurses according to place of activity and knowledge of theory score

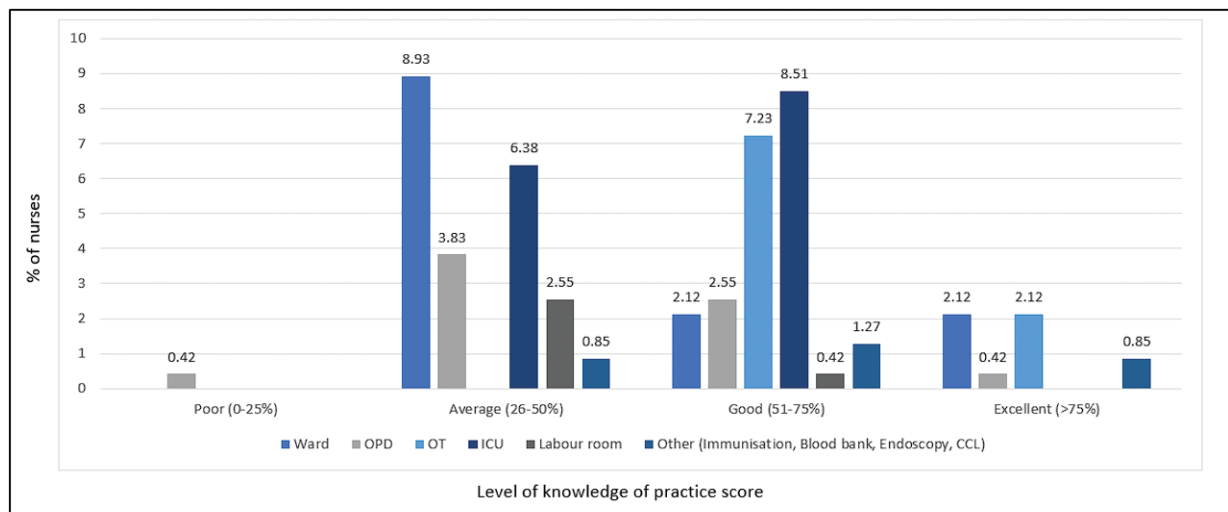


Figure 7. Distribution of nurses according to place of activity and knowledge of practice score

certain departments.

Knowledge of theory scores were excellent in majority of participants from each department while overall knowledge of practice ranged from good to average. Staff from OTs and ICUs showed highest scores for theory and practice which may be due to more number of experienced nurses working in these areas and the greater need for importance of reducing incidence of surgical site infections and maintaining a sterile field.⁸⁻⁹

While the majority of participants had excellent knowledge regarding theory irrespective of their years of experience, the knowledge of practice was mostly average among those with <5 years of experience while it was good in those with >5 years of experience. These findings are in agreement with a study conducted in 2007¹⁰ which demonstrated that increased experience in a hospital was significantly correlated with increased knowledge, improved attitudes and the implementation of infection control practices among various categories of staff. However, 1.27% of the junior nurses had excellent levels of knowledge of practice while none of the experienced staff (>8 years or 5—8 years) received excellent scores, which may have resulted from higher participation in administrative activities than bedside patient care. A study conducted in 2013¹¹ confirms the same.

This study confirms findings from the literature that knowledge of theory of infection control among nurses is excellent, but a wide range of improvements is needed in the knowledge of practice. It also shows that excellent theoretical knowledge does not necessarily translate to excellent knowledge of practice. This is agreement with previous other studies conducted in 2016 and 2015.¹²⁻¹³

The study reported no relationship between knowledge of theory or practice of infection control and the age and educational qualification of the study participants. These findings are in agreement with a study conducted in 2010¹⁴ which indicated that age did not contribute to acquisition of knowledge about the practice of infection control.

LIMITATIONS

A major bias was that the study was only able to assess the knowledge of theory and practice of infection control through a self-reported questionnaire and not the actual performance of practices. The unequal distribution of staff regarding various parameters taken in the study population may have also contributed to certain bias in the results.

RECOMMENDATIONS

Keeping in mind the results of the study, the authors recommend stricter and regular monitoring and supervision of nursing staff by the Hospital Infection Control Committee. Senior experienced nurses can be encouraged to instruct and supervise junior and less experienced nursing staff on the practices of infection control and monitor nursing adherence to policies of the hospital. The Administrators should promote feedback of practice, individual reinforcement and appropriate rewards for good practice. Updating knowledge and practice of nurses through continuing in-service educational programs; emphasizing the importance of following latest evidence-based practices of infection control in continuing education/training program; providing training programs for newly hired nurses about infection control and at

regular intervals should be done to assess the level of practice. The lack of a proper surveillance and auditing of practice may have led to poor levels of practice in those with excellent knowledge which leads us to believe that regular observation is also required for the proper implementation of practice. A follow up study is therefore required to monitor the actual implementation of practice which is a far more reliable indicator than mere knowledge of practice.

END NOTE

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Conflict of Interest: None declared

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