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Original Article

ASSESSMENT OF KNOWLEDGE, ATTITUDE AND PRACTICES IN INFECTION PREVENTION CONTROL PRACTICES AMONG NURSES BEFORE AND AFTER TRAINING AT TERTIARY CARE CENTER, VISAKHAPATNAM

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ABSTRACT

Objective: The healthcare-acquired infections are associated with increased morbidity, mortality and healthcare expenditures. Infection transmission can be reduced significantly by adhering to infection control guidelines. Among healthcare workers, nurses are at more risk of exposures to HAIs and can cause cross-infection in patients. Nurses if properly trained, can actively participate in hospital infection control as well as protection of patients, visitors and other staff members. This study aims to assess the Knowledge, Attitude and practices among nurses in infection control practices before and after training.

Methods: This is a cross-sectional study conducted at Government hospital to assess knowledge, attitude and practice of Nurses before training. And then, training, especially classes, have taken for nurses on various aspects of IPC practices for 7 d and at the end of 7 d post-test was conducted.

Results: The correct response of Nurses for Hand hygiene section before training is 62.2% and after training it was 96.6%. Regarding Respiratory hygiene the correct response before training was 58.4% and 94% after training. About transmission-based precautions the nurses were not much aware before (54% correct response) and after training 93.6% answered well. Regarding safe injection practices, the percentage was 66% and 96.8% and About Biomedical waste management 78.8% and 99.8% before and after training, respectively.

Conclusion: Training has an impact to increase the knowledge, attitude and practice in their routine working for nurses so that infections can reduce in the hospital settings.

Keywords: Infection control practices, Hand hygeine, Safe injection practices, Biomedical waste management

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INTRODUCTION

Nosocomial infections are infections acquired in the hospital or other health care facilities that were not present or incubating at the time of the client's admission. It is also referred to as hospital-acquired infections. It includes those infections that become symptomatic after the client is discharged as well as infections among medical personnel [1].

Based on the available evidence, the overall impact of HAIs implies prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobials, high costs for patients and their family, and unnecessary deaths [2, 3].

Simple IPC interventions play an unparalleled role in the reduction of infection rates, thereby decreasing the overall morbidity and mortality in healthcare settings [4].

Current infection prevention and control (IPC) measures focus on proper performance of both routine practices (e. g., hand and respiratory hygiene) and additional precautions (e. g., airborne, contact and droplet precautions) by all HCWs [5, 6].

Infection prevention and control (IPC) is the key component to curtail the spread of infections and for combating rising AMR among bacteria [7, 8].

Nurses are the largest workforce in hospitals and are in the unique position to improve the quality of patient care by serving as a first-line defence for preventing and controlling the transmission of infections [9].

It is a professional and ethical requirement that nurses have up-to-date knowledge and skills for preventing the transmission of infections and practice them safely and competently at all times [10].

The goal of this questionnaire-based study is to assess the need for strategic implementation of IPC practices by evaluating awareness of IPC policies and procedures among nurses before and after training.

MATERIALS AND METHODS

Study design

This is a cross-sectional study conducted at Government hospital to assess knowledge, attitude and practice of Nurses before training. The training was divided into 5 sections 1. Hand Hygiene 2. Respiratory hygiene 3. Transmission based precautions 4. Safe injection practices, 5. Biomedical waste management, Classes have taken for nurses for 7 d and at the end of 7 d post post-test was conducted to know the knowledge, attitude and practices of the nurses after training.

Study setting and period of study

The study was carried out at Tertiary Care Centre, Visakhapatnam. The study was conducted from May 1st, 2023 to April 30th 2024.

Study population and sample size

The study comprised a total of 100 nurses working at Tertiary care centre in various departments and who participated in training for 5 d completed the survey questionnaire.

Inclusion criteria

The study included nurses who are willing to participate in pre-test and training classes and again in post-test.

Exclusion criteria

1. Other healthcare workers, like sanitation workers, lab-technicians even though attended for classes were excluded.

2. Nurses who participated in the pre-test and not participated in post-test were excluded and vice versa.

RESULTS AND DISCUSSION

Socio-demographic characters and infection prevention training

Among 100 participated nurses, 58% belongs to 21-30 y age group, 25% (31-40 y), 11% (41-50 y) and 6% are>50 y. Most (86%) of the participated nurses are female and 14% are male. The working experience of participated nurses (below 5 y – 49%, 6 to 10 y experience in 30%, 11-15 y in 18%, and>15 y in 3% nurses. 52% of nurses attended workshops seminars on IPC Practices before this training and 48 % of nurses are never participated in Infection control training programmes but have some information about IPC practices through Internet (30%), Self-learning by books (18%)

Table 1: Respondent's knowledge, attitude, practice component regarding 'Hand hygiene' before and after training (only correct responses are shown in the table)

S. No.	Variable	Before training	After training
1.	What are the infections which can transmit with the poor hand hygiene a) Clostridium difficile b) Staphylococcus aureus c) Hepatitis A d) All the above Ans: All of the above	40%	92%
2.	What is recommended when your hands are visibly soiled? a) Alcohol Hand rub b) Hand washing with plain water c) Hand washing with Soap and water Ans: Hand washing with Soap and water	72%	100%
3.	. What are the 5 WHO moments regarding Hand hygiene? 1. Before Touching the Patient 2. Before any Aseptic Procedure 3. After Blood and Body fluid exposure risk 4. After touching the patient5. After touching Patient surroundings	48%	94%
4.	Correct order of hand hygiene practice (correct practice: Wet–soap–rub–wash–dry)	65%	99%
5.	Hand washing is necessary even you wear gloves while giving the patient care-YES	86%	98%
	Total correct responses	62.2%	96.6%

Table 2: Respondent's knowledge, attitude, practice component regarding 'respiratory hygeine and ppe' before and after training (only correct responses are shown in the table)

S. No.	Variable	Before training	After training
1.	Which of the following is false regarding Respiratory Hygeine a) Cough/Sneeze on the disposal napkin and wash your Hands b) Cough and sneeze over the shoulder if a napkin is not available c) Keep the distance of 3 feet from others while coughing d) Hands can be used if napkin not available Ans: d. Hands can be used if napkin not available	92%	100%
2.	Statement: For routine Blood pressure monitoring, we should use the gloves Ans: False	75%	99%
3.	What the Correct sequence of Donning of PPE? Ans: Hand Hygiene – Gown – Mask – Goggles – Gloves	42%	89%
4.	What is the correct sequence of removing of PPE Ans: b. Gloves – Goggles-Gown – Mask – HH	38%	92%
5.	What N95 masks refers to Ans: c. not resistance to oil, filters 95% air borne particles	45%	90%
	Total correct responses	58.4%	94 %

Table 3: Respondent's knowledge, attitude, practice component regarding 'transmission-based precautions' before and after training (only correct responses are shown in the table)

S. No.	Variable	Before training	After training
1.	What are the 4 main modes of Transmission of Infection? Ans: Contact, Air borne, Blood and Body fluid Borne, Droplet borne	54 %	92 %
2.	Tuberculosis is transmitted by Ans: Droplet borne	52%	97%
3.	Which of the following is NOT a blood-borne disease? a. HIV c. HCV b. HBV d. Staphylococcus Ans: d. Staphylococcus	75%	99%
4.	For Air borne pathogen isolation room, what type of pressure is needed a. Negative pressure b. Positive pressure Ans: Negative pressure	54 %	94%
5.	What is COHORT source isolation? Ans: To segregate a number of patients with the same infection in one ward when there are inadequate number of single rooms to prevent the spread of infection.	35%	86%
	Total correct responses	54 %	93.6 %

Table 4: Respondent's knowledge, attitude, practice component regarding 'safe injections practice' before and after training (only correct responses are shown in the table)

S. No.	Variable	Before training	After training
1.	In the situations where recapping is considered necessary, the method followed is Ans: Single-handed scoop method	48 %	95 %
2.	If Needle stick injury occurred from the HIV known patient which is the best time to take the post-exposure prophylaxis? Ans: within 2 h	67%	96 %
3.	If same drug is given to different patients, the Vail and injections can be shared Ans: False	94 %	100%
4.	According to Spaulding's Classification-Non critical item Among the following is a. Endoscope c. BP cuff b. Surgical blade d. Cystoscope Ans: c. BP cuff	36 %	93 %
5.	For cleaning of Blood spill on the floor we use Ans: 1% Sodium hypochlorite	85%	100%
	Total correct responses	66 %	96.8 %

Table 5: Respondent's knowledge, attitude, practice component regarding 'Biomedical waste management' before and after training (only correct responses are shown in the table)

S. No.	Variable	Before training	After training
1.	What are the colour codes of biomedical waste? Ans: Yellow, Red, Blue, White PPC	87%	100%
2.	Correct sequence of Biomedical Waste Management Ans: Segregation, Collection and Storage, Transportation, Treatment and Disposal.	60%	99%
3.	Linen contaminated with blood should disposed in which container Ans: Yellow	90%	100%
4.	Glassware and metallic implant disposed in which colour bag? Ans: Blue Bin	83%	100%
5.	Disposable gloves contaminated with blood should discarded in Ans: Red bag	74%	100%
	Total correct responses	78.8%	99.8%

The Section regarding transmission-based precautions showed less percentage of correct response before training among all IPC practices sections that is less Knowledge regarding special precautions which have to follow for particular diseases.

The Section regarding biomedical wate showed good Percentage of Correct response before training itself, revealing the good knowledge regarding biomedical waste.

Overall percentage response of the participants before-training is 67.44% and after training is 98.28%.

DISCUSSION

In the present, more than 40% of nurses correctly answered over 80%of the questions regarding important aspects of infection control. Knowledge of hand hygiene was adequate, but a significant deficiency in the knowledge of other infection control practices like BMW, PPE and transmission-based precautions was observed before training. As approximately 45% of the nurses provided average or below average responses before training. This finding was is very important because it contradicts the effectiveness of extensive in-house infection control program and training.

Studies have reported varying levels of knowledge regarding IPC practices among nurses and varying levels of attitudes and practices among nurses. A study of HCW'S in Nepal reported that 16% of HCW's had knowledge of infection control.

In addition, a study by Angelillo *et al.* demonstrated the continuing education courses on hospital infections positively impacted infection control procedures and compliance with barrier techniques. Despite the documented guidelines, the rates of hand hygiene practices by HCW's remain low. The rate of adherence is 40%, as determined from the average adherence rates reported in 34 studies from 1981 to 2000.

In present study, 67.44% of nurses were aware of standard precautions and hand hygiene practices before training itself and 978% of nurses answered well after training about hand hygiene. 78.8% of nurses know how to segregate biomedical waste before training, but some doubts about the colour coding of some materials like blood bags, vacutainers etc. before training. 99.8% of nurses answered well after training,

CONCLUSION

The healthcare personal in this study did not have enough knowledge of infection prevention and control, the attitude and implementation of safe procedures were not sufficient favourable and safe enough to their expected standards before training.

Health care workers practical awareness of basic elements such as duration of hand washing, donning and doffing of PPE, disposable of biomedical waste into colour-coded bins was unsatisfactory due to which it may lead to increased risk of HAIs to health care workers, patients, visitors and community.

After training of nurses, the knowledge has increased as per questionnaire. The limitation of this study is practical component and analysed based on a questionnaire only, but not direct observation or auditing the procedure.

But definitely training has an impact to increase the knowledge, attitude and practice in their routine working. Some components like transmission-based precautions need to be strengthened. Biomedical waste colour-coded bins should be provided and segregation should be proper.

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AUTHORS CONTRIBUTIONS

First author of the study N Sujatha contributed conceptual design, literature search and data collection. The second author S Venkanna Babu, contributed data analysis statistical analysis and wrote the

first draft of the manuscript. The third author B Srivani Vijaya Subhashini guided the work and corrected the manuscript.

CONFLICTS OF INTERESTS

The study declared 'no conflicts of interest

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