Research Paper Medical Science

Impact of Training on Knowledge, Attitude and Practices Scores of ICU Nurses regarding Standard Precautions of Infection Control in a Super Speciality Hospital of Delhi

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ABSTRACT

Context:Healthcare-associated infection is one of the biggest issue among patients in intensive care units as it could result in significant morbidity, prolonged stay in hospitals, and substantial increase in health care costs. The role of critical care nurses is extremely important in preventing hazards related with healthcare-associated infections.Training the nurses on important aspects of Infection control thus becomes essential to increase their awareness and hence inculcate an environment of patient safety.

Aim:The aim of this study was to assess the effect of a training intervention regarding standard precautions of infection-control measures on nurses' knowledge, attitude and practices in two ICUs of a super speciality hospital in Delhi.

Settings and Design:The study design is a survey research which has used a self-administered questionnaire to compare the knowledge, attitudes, practices (KAP) of nursing professionals of an ICU in a tertiary care hospital.A purposive sampling technique was used to get a sample of 47 ICU nurses. After testing their current levels of Knowledge, Attitude and Practice they underwent a training program which included a lecture on Standard Precautions for Infection Control (Based on WHO Guidelines), Videos of Hand hygiene and study material in form of handouts and posters. A post intervention analysis of nurse's knowledge, attitudes and practices was done one week later using the same data collection tool in which 39 out of 47 nurses participated.

Methods and Material:The WHO Standard Precautions for infection control were used as a guideline for preparing the self-administered questionnaire and training material i.e. the lecture PPT and Handouts. The scoring system was based on a study done by Uba et al (2015)

Statistical analysis used:Paired T test and radar chart were used to assess impact of training and observe differences between the pre and post training results.

Results:The study reveals that there was a significant increase in Knowledge and Practice scores of ICU Nurses post training.

Conclusions:To inculcate an environment of patient safety it is essential that the nurses have sound knowledge levels regarding methods of infection control. Continuous training program will significantly increase the knowledge levels of the critical care staff and hence improve their infection control practices.

KEYWORDS Healthcare Acquired Infections (HCAI), Standard precautions, Infection Control, Knowledge, Attitude, Practice, Training

Introduction

A WHO survey showed an average of 8.7% of hospital patients had healthcare associated infections. At any time, over 1.4 million people worldwide suffer from infectious complications acquired in hospital (CDC 2015). The most commonly occurring healthcare acquired infections were pneumonia and lower respiratory tract infections, surgical site infections, urinary tract infections and bloodstream infections. As indicated by Louis, (2011) a huge number of immune compromised patients are admitted to ICUs and approximately 51% of ICU patients are infected with some or the other infection; the majority of these are healthcare associated infections and the risk of acquiring an infection increases with duration of stay in intensive care.

Hence it becomes essential for the ICU staff to ensure effective infection control practices to reduce the rate of these infections. Device-associated infections, like Catheter-associated-urinary tract infections, catheter associated Blood stream infections and Ventilator associated Pneumonia accounted for 25.6% of all health care–associated infections according to CDC survey reports. (Magill S, 2014). This gives rise to the need of having skilled and trained staff with sound knowledge of standard precautions for Infection control.

Simple measures like hand washing and hand rubbing can reduce the rate of infection drastically. Previous studies have shown that hand hygiene compliance among healthcare workers is generally low, which implicates the need of improving their practices by regular training programs.

The tool developed for the study was guided by the standard precautions defined by the World Health Organization. WHO has compiled guidelines in 2006 to provide evidence and recommendations for improvement of hand hygiene. These guidelines were based on successful experiences showing a consequent reduction in health-care associated.

The aim of the study was to assess nurses' knowledge, attitude and evaluate their self-reported practices regarding standard precautions for infection control and to analyse the impact of training on the KAP scores in two ICUs of a selected super speciality hospital. The specific objectives were

a) To assess the Knowledge, Attitude and Practices Scores of ICU Nurses regarding Standard Precautions of Infection Control
b) To study the impact of training on Knowledge, Attitude and Practices Scores

Subjects and Methods:

Research design:

The current study was conducted at two intensive care units (Medical ICU & Stoke Unit) of a super-specialty hospital.A sample of convenience including 47 nurses out of a total of 55 nursing staff who work in two intensive care units of the selected study setting was taken. A structured questionnaire was developed, tested for clarity and feasibility, and then used to collect data pre and post training. Development of this questionnaire was guided by WHO Standard Precaution of infection control.This questionnaire consisted of two parts: a-demographic characteristics such as gender, age, department, years of experience, and b- a list of infection control standard precautions

(31 items). The tool's items were categorized under 8 main domains which were related to knowledge about Hand Hygiene, use of Personal Protective Equipment; Sharp Devices &Needle Stick Injuries; Respiratory Hygiene, Environmental Cleaning, Linen Management, Waste Disposal and Patient Care Equipment. One score was allocated to each right answer and zero to the wrong answer. Scores of 70% or less were considered below average, scores between 71-80% average, 81- 90% good and above 90% were very good. The Scoring System is based on a study done by Uba et al (2015). Designed tools were examined for content validity by a panel of five experts in the field of Critical Care Medicine, and Critical Care and Emergency Nursing to test their clarity and objectivity and if they are suitable to achieve the aim of the study. The content of training module included a Lecture presentation, Study hand-outs and posters for work areas. Post training survey was done 5-7 days after training. A total of 39 out of 47 nurses participated in post training survey. Pre and post training results were coded and analysed to find the impact of training.

Ethical Clearance and confidentiality: The current study was approved by ethical committee of the concerned University and permissions were obtained from Scientific Committee, Ethics Committee, Quality Heads and Nursing Directors of the ICU at the selected Hospital. As well written consents were obtained from critical care nurses after explaining the purpose and nature of the study. Each nurse was free to either participate or not in the current study and had the right to withdraw from the study at any time without any rational.Also, nurses were informed that obtained data will be used only for research purpose and not for their evaluation. Confidentiality and anonymity of each subject were assured through coding of all data.

Methodology:

The current study started with preparation and validation of data collection tool and followed by administrative permissions to carry out the study. This phase lasted for about four months. Actual study was carried out after obtaining official permissions. Data of the current study were collected over a period of Six months starting from August 2014 to Jan 2015. The selected ICUswere visited on twice a week basis, and nurses were approached during two shifts (morning and afternoon) to ensure that all the nurses were included in the study. Their rotational duty cycle confirmed postings in these shifts during study period. They were explained the purpose and nature of the study and written consents were obtained from those who accepted to share in the study. Then involved nurses were given the Structured Questionnaire. The researcher/research associate was available at the ICU during the time of filling the data collection sheet to answer any question, and to provide the needed explanations. Filling the questionnaire required about 20 minutes from each nurse. Obtained data was fed into Microsoft Excel for further analysis. A training program was conducted post this which included a lecture presentation, videos on hand hygiene and distribution of hand-outs to the nurses. Post training survey was done almost a week after training. A total of 39 out of 47 nurses participated in post training survey. Pre and post training results were coded and analysed to find the impact of training.

Results and Discussion:

The study reflects the current levels of the knowledge and attitudes and the self-reported practices of the critical care nurses. A total of 47 nurses responded giving information in the structured format. In spite of repeated contacts we could illicit response from about 70% nurses due to very busy schedules in ICUs. A training program was conducted after assessing the current Knowledge, Attitudes and Practices of the nurses. Post training, 39 nurses participated in the survey and the results showed significant impact of training on their KAP Scores. Details like few demographic characteristics like sex, age and work experience of the Pre-training and Post-training Groups are given in Table 1 and 2 respectively. Only 39 nurses out of 47 nurses in Pre-training group could participate in the post training survey.

Table (1) Demographic Details of ICU Nurses (Pre- training group) of a Tertiary care Hospital in Delhi NCR, 2014

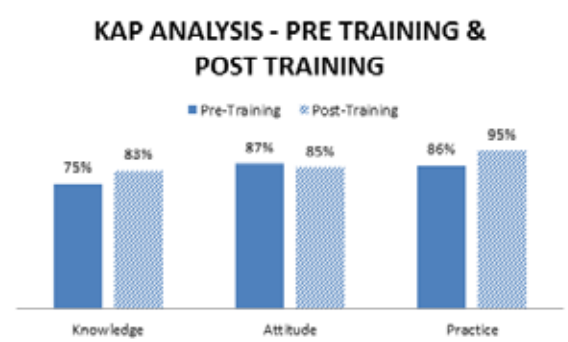
Number of Nurses = 47	
Gender	**Number**
Male	7
Female	40
Age Group	**Number**
Below 20 Years	1
20-30 Years	41
30-40 Years	2
Above 40 Years	3
Work Experience	**Number**
Up to 1 year	8
1-2 years	9
2-5 years	19
Above 5 Years	11

Table (2) Demographic Details of ICU Nurses (Post-training group) of a Tertiary care Hospital in Delhi NCR, 2014

Number of Nurses = 39	
Gender	**Number**
Male	7
Female	32
Age Group	**Number**
Below 20 Years	1
20-30 Years	32
30-40 Years	4
Above 40 Years	0
Work Experience	**Number**
Fresher	1
Up to 1 year	10
1-2 years	6
2-5 years	14
Above 5 Years	8

As revealed from the current study and depicted in and Table 1&2 majority of the participant nurses sample were female and largely between 20 to 30 years old. Table 1 &2 also illustrate that the maximum number of respondents had 2-5 years of work experience,

Figure (1) Graphical Representations of the difference in Pre & post Training KAP Scores



The overall KAP results are given in Figure 1 through a graphical representation. The graph exhibits that there was aninrcease in Knowledge and Practice scores. While the percentage of correct responses moved up to 83% from 75% post training, the practice score scaled to 95% from 86% post training. There was a marginal decrease in Attitude score (from 87% to 85% post training). The findings are in sync with the findings of Mohamed 2011, Galal 2014 who stated that training or educational programs had a positive impact on Knowledge, Attitude and Practices of healthcare workers.

Category Wise KAP Analysis: Pre Training and Post Training

In order to gauge the effect of training on Knowledge, Attitude and Practice scores among the nurses, analysis was con-

ducted for each of 8 categories and the results are presented in the table 3 below.

Table (3) Category wise difference in Pre & post training KAP Scores

		H/H	PPE	NSI	RH	EC	LINEN	WD	PC
Knowledge	Pre Training	85.10	89.70	78.70	72.30	89.30	38.29	34.00	NA
	Post Training	86.10	92.80	89.70	84.60	74.30	76.90	58.90	NA
	Increase/ Decrease	1.00	3.10	11.00	12.30	-15.00	38.61	24.90	NA
Attitude	Pre Training	98.90	90.40	95.70	65.90	93.30	NA	NA	NA
	Post Training	97.40	89.10	94.80	66.60	87.10	NA	NA	NA
	Increase/ Decrease	-1.50	-1.30	-0.90	0.70	-6.20	NA	NA	NA
Practice	Pre Training	90.00	87.20	95.70	NA	NA	NA	72.00	87.20
	Post Training	95.60	97.40	94.80	NA	NA	NA	82.05	97.40
	Increase/ Decrease	5.60	10.20	-0.90	NA	NA	NA	10.05	10.20

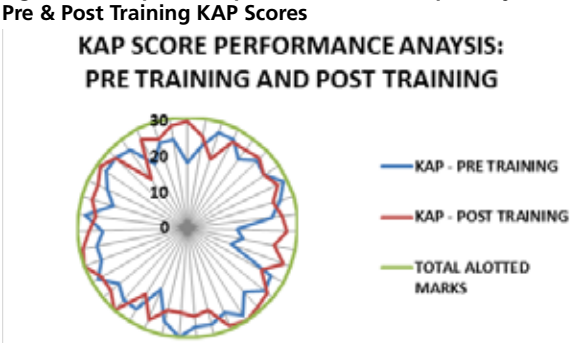
The results indicate that the percentage of correct responses pertaining to Knowledge and Practice increased for most of the categories after training, while there was a marginal decrease in Attitude scores for most of the categories after the training. The Maximum increase was seen in Knowledge Scores of Linen management, Waste disposal, Environmental Cleaning and respiratory Hygiene.

The practice scores showed maximum increase in Waste Disposal, patient care equipment and use of personal protective equipment.

GAP ANALYSIS for KAP Scores: PRE AND POST TRAINING

Gap Analysis for KAP scores were conducted to obtain insight about the effectiveness of the training and the results are depicted through the Radar Chart below. It is evident from the Radar Chart that the GAP between the obtained scores and the maximum scores decreased after the training, which suggested the effectiveness of the training program that was being conducted for the improvement of KAP scores among the nurses.

Figure (2) Graphical Representations of Gap Analysis for Pre & Post Training KAP Scores



1. H_1: There is an Impact of Training on Overall KAP Scores - Pre and Post Training Analysis

Paired T Test was carried out to measure the impact of Training on the overall KAP scores and the results are depicted in Table 4. From the table it is evident that the pre training mean KAP score for the nurses' was lower than the post training mean KAP score for the nurses. Further the Sig value is below the set level of significance, α (.05) which confirmed that the result was significant. Thus, it can be concluded from the result that the training program was effective to improve the overall KAP scores for the nurses.

Table (4) Paired T-test (Single tail) for Pre Training & Post Training KAP Scores

T-Test: Paired Two Sample for Means		
Statistics	*KAP - PRE TRAINING*	*KAP - POST TRAINING*
Mean	25.08	27.00
Variance	17.81	9.00
Observations	39.00	39.00
df	38.00	
t Stat	-2.13	
Sig value	0.04	

2. H_2: There Is An Impact Of Training On KAP Scores For Each Category

Paired T Test was carried out for each of 8 categories to measure the impact of Training on the KAP score for each category and the results are depicted in Table 5. From the table it is evident that the significant results have been obtained for Hand Hygiene, Linen and Waste Disposal, while the results were non-significant for rest of the categories. Hence it can be mentioned that training had proved to be effective to increase the KAP scores of the nurses for Hand Hygiene, Linen and Waste Disposal. However, it cannot be said for the rest of the categories.

Table (5) Impact of Training (T statistics & p value) on each sub category of Standard Precautions at CI=95%

Categories	T Statistics	P Value	Remarks
Hand Hygiene	-2.73	0.01	Significant
PPE:Gloves,Facial Protection, Gown	-1.80	0.08	Non-Significant
Needle Stick Injury(NSI)	-0.72	0.47	Non-Significant
Respiratory Hygiene(RH)	-0.10	0.92	Non-Significant
Environment cleaning(EC)	0.19	0.82	Non-Significant
Linen	-4.22	0.00	Significant
Waste Disposal(WD)	-2.07	0.04	Significant
Patient Care Equipment	-1.96	0.06	Non-Significant

Summary

The study was done to analyse the Knowledge, Attitude and Self-reported practices (KAP) of two ICU of a tertiary care hospital in Delhi. The findings of the study show that majority of the nurses were females in the age group of 20-30 and had Good (KAP 81-90%) Knowledge, Attitude and Practice related to Standard Precautions for Infection Control.

The post Training results show that there is a significant impact of training on Knowledge and Practice Scores of Nurses and training had proved to be effective to increase the KAP scores of the nurses for specifically for Hand Hygiene, Linen and Waste Disposal related questions.

Conclusion & Recommendations

The study thus concludes that as Knowledge and Attitude of the Critical care nurses significantly affects their practices for infection control, it becomes imperative for the hospitals to ensure that the nurses have a good level of knowledge and positive attitude for infection control. Results of the study also emphasize the positive impact a training program will have on the knowledge and practice scores hence the healthcare organisations can engage in continuous training programs to regularly maintain and enhance the knowledge of the nurses.

The following recommendations can be made for future research work:

1. Training programs can be done to increase the knowledge of the nurses so as to increase their practices for Infection Control.
2. Only two ICUs were taken into the study, the model can be applied to other Critical units and inpatient areas.
3. The survey was done only for nursing staff, hence future studies can include other healthcare workers like doctors, paramedics etc.

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