Training the Trainer Nurses on Infection Control at Student Hospital

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Abstract ::

Healthcare-associated infection is one of the most common complications of health care management. **Aim of study**: Train the trainer nurses on infection control at student Hospital Mansura University. **Research Design**: Quasi research design was used to conduct this study. **Data collection**: the data was collected during the period of August to October 2015 from nurses. **Setting:** The study was conducted at Students Hospital affiliated to Mansoura University (emergency ward, clinics, inpatient ward, operating room and private ward). **Study sample**: convenient sample was used it consists of (70 nurses include 10head nurses, 60 staff nurses).**Tools**: **five** tools were used in this study: **tool I:**Self administrated questionnaire to assess socio demographic and professional characteristics. **Tool II:** Self administrated questionnaire to assess nurses' knowledge about infection control. **Tool III**: self-administrated questionnaire to assess nurses' subjective performance. **Tool IV:** An observation check list to assess nurses' performance **Tool V:** Nurses' acceptance and satisfaction scale. **Results:** reveals that the mean scores of nurse's knowledge before implementing the program was 15.22(7.25)while after program implementation the mean score improved to40.12(4.31). There was statistically significant difference between total mean score of nurses' knowledge pre and post training program p=0.00. Regarding subjective performance the mean scores of nurse's before program the implementing was 1.66 ± 1.39while after program implementation improved to $6.56 \pm .77$. There was statistically significant difference between mean score of nurses' subjective performance pre and post training program p=0.00. **Conclusion:** This study concluded that nurses' knowledge and   performance were poor in pre-program and improved in post program.

Recommendations: continuous in-service training programs and refreshing courses should be conducted for nurses to update their knowledge and skills about infection control

Keywords: infection control, personal protective equipment's, hand washing, waste management.

Introduction:

Nosocomial Infections defined as "Any infection that is being acquired in a hospital, particularly when the source or the risk factor for it is one peculiar to the hospital". The matter of concern is that nosocomial infection or hospital acquired infection at the moment affect not less than 400,000 hospitalized patients at any time in the world and is direct or contributory causes of death for more than 80,000 cases a year in the USA alon ٢Billions of dollars are used annually in the developed countries alone for the control of just these hospital acquired inflection alone which reflect another aspect of the magnitude of the problem. (**Ingrid, 2009**&**Inweregbu et al., 2013**).

Nosocomial infection (Healthcare-associated infections) is a "localized or systemic condition occurring as an adverse reaction to the presence of an infectious agent(s) or its toxin(s) that was neither present nor incubating upon the patient's admission to the acute care facility" (**Centers for Disease Control and Prevention (CDC), 2013**).These infections occur on or after 72 hours (three days) following admission to an acute care facility and are caused by infectious agents from endogenous or exogenous sources **.**It is considered one of the most common complications in hospitalized patients during the last 20 years.Nosocomial infections contribute to the overall morbidity of patients and increase the costs for health care systems (**Sax et al., 2011**).A high frequency of nosocomial infections is evidence of a poor quality of health service delivery, and leads to avoidable costs. This is of extraordinary importance especially when caring for severely immune compromised patients such as on transplant units (**Alonso et al., 2012 & Linares et al., 2010**).

In the United States, the Centers for Disease Control and Prevention (CDC) estimated roughly 1.7 million hospital-associated infections, from all types of microorganisms, including bacteria, contribute to 99,000 deaths each year. In Europe, where hospital surveys have been conducted, the category of Gram-negative infections is estimated to account for two-thirds of the 25,000 deaths each year (**Kleve's et al.,2007 & Central for Disease Control and prevention, 2014).**

Prospective surveillance was conducted from April 2011 through March 2012 in 46 from 11 hospitals in Egypt revealed that 472 HAIs out of 90,515 patient-days of surveillance data was identified as: 47% were pneumonia, 22% were bloodstream infections, and 15% were urinary tract infections; case fatality among HAI case patients was 43% **(See et al., 2013&Greinerw, 2007 &Breiman et al., 2013&Saied etal., 2011)**

The infection control team is responsible for the day-to-day activities of the infection control programme. Health care establishments must have access to specialists in infection control, epidemiology, and infectious disease, including physicians and infection control practitioners. In some countries, these professionals are specialized teams working for a hospital or a group of health care establishments; they may be administratively part of another unit (e.g. a microbiology laboratory, medical or nursing administration, public health services). The optimal structure will vary with the type, needs, and resources of the facility **(Wiggle & Neil,2013 & Nelson, 2014).**Training program are the organized procedure by which people learnknowledge and skills for a definite purpose. Training refers to the teaching and learning activities carried out for helping members of an organization acquire knowledge and attitude needed by a particular job in this organization. Health care workers training is important and essential to improve their competency and development self confidence that impact on work management. **(KUMAR, KATTA ASHOK**, 2013).The goal of continues education in nursing is to enhance knowledge, performance and attitude of nurses and ultimately to promote quality of healthcare delivered to the public. Keeping nurses' aware of the hospital polices and working conditions to have clear understanding of their responsibilities **(Ranking & stalling, 2008).**The trainer should communicate to the trainees about what is expected out of training in a simple and professional way**(Social CareInstitute for Excellence, 2014).**

Aim of this study: Train the trainers' nurses on infection control at Student Hospital Mansoura University.

Research Hypothesis

Trainers nurses'performance related to infection control will be improving after the training sessions.

Trainers' nurses will be able to train other health team members

on infection control after the training sessions.

Subjects and Method

1-**Research Design**

Quasi research design will be used to conduct this study.

2- **Setting**

The study was conducted at Students Hospital affiliated to Mansoura University.

3- Subjects

Nurses (bed side nurses and head nurses).

Sample convenient sample

Sample size

Total number of nurses working at the Students Hospital affiliated to Mansura University, was 70 nurses; 60 out of them were bed side nurses and the entire 10 were head nurses.

Tools: To achieve the aim of this study, five tools used for data collection.

Tool I:

Self-administrated questionnaire to assess socio demographic and professional characteristics:

Part I: It designed to assess the socio-demographic (e.g. age, gender, residence).

PartII: Professional characteristics of the nurses(e.g. qualification years of experience ,attending training courses about infection control, duration of the last training courses, organizers of the courses, axes of the courses.

Tool II: Self administrated questionnaire to assess nurses' knowledge about infection control.(eg.infection control team, infection control and its cycle, personal protective equipment, hand washing, disinfected and sterilization, waste management).

Tool III: self- administrated questionnaire to assess nurses' subjective performance

This tool consisted of five questions about technique of wearing gloves, action taken following needle use, needle stick, spilled blood on the floor and wastes segregation.

Tool IV: An observation check list to assess nurses' performance it concerned with nurses' performance related to infection control.

Tool V: Nurses' acceptance and satisfaction scale

It was four points Likert scale used to evaluate nurses' acceptance and satisfaction from the training.

Method

This study was accomplished throughout two main stages:

Preparation stage

1-Administrative process

An official letter was issued from the Faculty of Nursing Mansoura University to the director of Students Hospital affiliated to Mansoura University to permit the researcher to carry out the study.

2- Literature review

Review of national and international literatures on the 'various aspects of the infection control using scientific published articles. This review was a guide for developing the study tools.

3-Developing of the study tools

Tools of data collection were developed by the researcher based on reviewing the relevant literature.

Validity content validity was done to the tools by submitting the tool to expertise in the field of community health nursing.

Reliability of tool V scale of acceptance and satisfaction was tested by using the Cranach's alpha test in spss v0.61.

Pilot study

A Pilot study was conducted on 10 % of nurses (7nurses) who were selected randomly and excluded from the studied sample to evaluate the clarity, applicability, and reliability of the research tools and to estimate the approximate time required for data collection. Accordingly the necessary modification was done, some questions were added and others were clarified or omitted.

Stage II: Operational phase

1-Data collection

The data was collected from August to October 2015 from nurses working in four departments: inpatient, private and emergency departments and operation room and outpatient clinics at Students Hospital affiliated to Mansoura University.

2- Preliminary assessment

First, second, and third tools were usedto assess nurses' knowledge and subjective, performance which revealed poor knowledge and performance related to infection control.

3-Developing training session Based on obtained data from preliminary assessment the researcher developed training sessionsto improve nurses' knowledge and performance related to infection control.

4-Implementation of training sessions

The training sessions implemented withinworking hours, for seven nurses per session.

The training sessions were done three times per week covering daily shifts. The duration of each session was 60- 90 mints. Ten sessions were applied in 10 days (10 groups of nurses, each included 7 nurses).

Each session started with a brief summary of the previous session and objectives of the new session.

Theoretical session's conducted through group discussion using a very simple language, using power point that suits the level of nurses without ignoring motivation and reinforcement techniques.

Practical sessions started by using power point presentations followed by

demonstration and re-demonstration by using real materials and instruments.

5-Evaluation of the training sessions

The evaluation phase of the training sessions by usingfirst, second, third, and fourth tools immediately and after the sessions.

6- Data analysis

Data were collected, computed and statistically analyzed using Stands for Statistical Product and Service Solutions (SPSS) version16.0, which was applied to frequency tables, number and percentage, and standard deviation (SD), Significant at p ≤ 0.05

Results:

Table (1) illustrates the socio demographic and professional characteristics of the nurses'. The professional categories of the studied nurses' including nurses' supervisors represent (14.3%).While nurses' represent (85.7%); nurses' age ranged from 25 up to 35 years, with a mean age 30.36 ± 5.96 years.

The majority of nurses' (85.7%) had nursing school diploma, while only (14.3 %) of them had bachelor degree in nursing.

As regard the nurses' years of experience,(44.3%) of nurses' had a working experience less than 10 years ,while (55.7%) of them had a working experience more than 10 years. with mean 12.61 ± 5.68years of experience .

7-Ethical consideration

An approval was obtained from Research Ethical Committee, Faculty of Nursing Mansoura University to accomplish this study.

Oral approval was obtained from the nurses. The researcher introduced herself and a simple explanation about the aim of the study would give to them. They assured that their participation in the study was voluntary and that collected data would treat confidentially and would be only used for the purpose of the study. Nurses would be informed that they had the right to withdraw at any time from the study.

All the studied nurses (100.0 %) attended training courses. which organized by faculty of medicine. The infection control courses were related topolicy and universal precautions for 2 days. There wasn't any pre-employment or post-employment medical checkup for the studied nurses'.

Table (2) reveals the mean score of nurse's knowledge pre and post program implementation. The mean scores of nurse's knowledge before implementing the program was 15.22(7.25)while after program implementation the mean score improved to40.12(4.31).There was statistically significant difference between total mean score of nurses' knowledge pre and post training program p=0.00. Regarding subjective performance the mean scores of

nurse's before program the implementing was 1.66 ± 1.39while after program implementation improved to 6.56 ± .77. There was statistically significant difference between mean score of nurses' subjective performance pre and post training program p=0.00.

Table (3) Distribution of the nurses' satisfaction regarding to training environment, training contents and trainer skills

Table (3) represents the distribution of the nurses' satisfaction regarding to training environment and training contents. This table Illustrates that more than half (57.1%)of the nurses' were highly satisfied with preparation of the surrounding environment, content of activity and

methods used in the training activities. While less than three fourths(71.4%) of the nurses' were highly satisfied with time schedule. Regarding training content the majority

(81.4%,81.4%,84.2%,87.1%,91.4%) of the nurses' were highly satisfied with program objectives and reported the objectives are important. While (57.1%) revealed the methods used in the training activities were interested. As regards to trainer skills the trainer (28.5 %) of nurses' reported that trainer explains the content training clearly and give time to discuss and ask questions. The majority (91.4) reported the trainer is good communicator.

Table (1) Socio demographic and professional characteristics ofthe studied nurses' (n=70)

Items	n=70	%
Professional categories		
Nurses supervisors	10	14.3
Nurses	60	85.7
Age in years		
25-< 30	39	55.7
30 - <35	20	28.6
≥35	11	15.7
Mean (SD)	30.36 (5.96)	
Qualification		
Baccalaureate of nursing	10	14.3
Nursing Diploma	60	85.7

Years of experience		
<10	31	44.3
≥ 10	39	55.7
Mean (SD)	12.61 (5.68)	

Table (2)Distribution of the studied nurse's according to their mean knowledge and their subjective performance about infection control precaution (n=70).

Item	Pre	Post	T	P
	Mean ±SD	Mean ±SD		
Total knowledge scores	15.22 (7.25)	40.12±4.31	26.877	<0.001*
Total subjective performance scores	1.66 (1.39)	6.56 ± .77	25.503	<0.001*

Table (3) Distribution of the nurses' satisfaction regarding to training environment, training contents and trainer skills

Items	Highly satisfied N=70		satisfied N=70	
	N	%	N	%
1-Training environment Preparation of the surrounding environment	40	57.1	30	42.8
Time schedule	50	71.4	20	28.5
2-Training content				
The program was organized	50	71.4	20	28.5
The objective was clear	45	64.2	25	35.7
Program objectives were important	57	81.4	13	28.5
Program objectives were achieved	50	71.4	20	28.5
Content of activity was relevant to nurses experiences and needs	40	57.1	30	42.8
Methods used in the training activities were interested	40	57.1	30	42.8

Trainer skills				
Trainer explain the content training clearly	50	71.4	20	28.5
Trainer give enough time to activities .	50	71.4	15	21.4
The trainer give time to discuss and ask questions	55	78.5	20	28.5
The trainer answered any questions.	50	71.4	11	15.7
The trainer re demonstrate the activity if the trainees do not understand	59	84.2	25	35.7
Trainer makes sure that trainees understand before moving to another part of the program	45	64.2	18	25.7
Create an atmosphere of trust between trainer and trainees	52	74.2	20	28.5
Trainer used available training methods	61	87.1	9	12.8
Good communicator	64	91.4	6	8.5

Discussion:

Infection prevention and control training program aim at ensuring the protection of those who might be vulnerable to acquire an infection in the general community and while receiving care, in a range of settings. The basic principle of infection prevention and control is hygiene. The goal of the Infection Prevention and control Program training is to provide support to the hospital in minimizing the risk of infection to patients, hospital staff, physicians, students, volunteers and visitors. Considering that nurses is in the constant touch with the patient and is also the important link between clinician and patient, the training program aims at creating   large work force of empowered nurses, who can help in prevention and control of infection within

the hospital, which has huge potential to improve theclinical outcomes **(WHO,2015).** World Health Organization (WHO), center for disease prevention and Control(CDC), Health Infection Control and Prevention Advisory Committee(HICPAC), (2015), stated that continuing education and training of nurses, as well as monitoring of infection control practices, will help to ensure that the progress is sustained. This is in agreement with the aim of the present study that was to train the trainer nurses on infection control.

This part will be concerned with nurses'**sociodemographicandprofessional characteristics.** The present study revealed that, the mean age of the studied nurses was 30.36(5.96) years (range 25-30 years). This result is in the same line with **Fahim et al.,**

(2011), who revealed that the mean age of the nurses whoperform infection control during vaccination at Menia, was 35.3(9.4) years. Concerning nurses' qualification, the current study illustrated that, the majority of the nurses' had nursing diploma. This result is in accordance with an investigation completed in Egypt by **Sreedharan and Venkatramana, (2011),** who reported that, majority of the studied nurses had nursing diploma.

As regard to the nurses' years of experience, more than half of the nurses had a working experience more than 10 years, with mean 12.61(5.68) years. This result matched with **Mohamed and Wafa, (2011),** who found that nurses had a working experience more than 10 years in Egypt, with the mean 10.31(4.60) years of experience.

Regarding to training programs, all the studied nurses attended training programs about infection control policy and universal precaution. This result agreed with **ElToukhy, (2006)**, who reported that, most of the studied nurses in Egypt attended

training courses about infection control.

Regarding the total mean score of nurses 'knowledge and performance pre and post program, therewas a high statistically significant difference between pre and post program implementation on nurses' knowledge and performance

thisresultagreedwith**Roberts,(2009),Nelsing, (2009),**

Gijare, (2012), Hamid et al., (2010), Ndikom and Onibokun,(2007) and **Talaat and Shamia, (2010).**They stated that continuous inservice training program is very important to improve knowledge and performance of nurses because the nurses in their studies showed high improvement after having the program. This indicates the importance of educational program in improving nurses' performance.

Regarding nurses' satisfaction the objectives of the training program**,** this study showed that less than three fourths of the studied nurses were highly satisfied with program objectives .This was in the same line with **Williams et al., (2008),**who found that three fourths of nurses were highly satisfied with their purpose of training program .

Regarding nurses' satisfaction to **trainers' skills**, this study showed that themajority of the nurses were highly satisfied with the trainer nusing available training methods. This agreed with **chang et al., (2014),** who reported that the majority of nurses were highly satisfied with trainer used available training methods. Also this result showed that less than three fourths of the nurses were highly satisfied with trainer who explains the content clearly. This agreed with **De Silva et al., (2015**), who reported that three fourths of the nurses were highly satisfied with the

trainer skills, content training clearly and was effective.

The current study also showed that the majority of the nurses' **were** highly satisfied with trainer communication**.** This finding was consistent with **KOOL, Nienke, et al.,(2014)** result who reported that the majority of nurses in his study were high satisfied with good communication of researcher.

Conclusion

The main conclusion drawn from the present study revealed that nurses' knowledge and performance were poor related to infection control in the pre- program while their knowledge and performance improved in the post program.

Therewas a high statistically significant difference between pre and post program implementation on nurses' knowledge and performance.

Recommendations

Continuous in-service training programs and refreshing courses should be conducted for nurses to update their knowledge and skills about infection control.

Equipped hospital with standard of structure is needed to apply infection control to achieve desirable outcome.

Continuous supervision and evaluation of nurses in hospital to determine any defect related to performance.

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