Research article

The Efficacy of Hands on Workshop on Infection Control to Healthcare Professionals: An Intervention Study

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Received: 1 April 2019
Revised: 24 June 2019
Accepted for publication 12 July 2019

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This article may be sighted as: Mukry SN, Safdar D, Ali R, Attari AA, Shamsi TS. The Efficacy of Hands on Workshop on Infection Control to Healthcare Professionals: An Intervention Study LMRJ. 2019; 1(2): 58-60. Doi:10.38106/ LMRJ. 2019.1.2-05.

Abstract

Strict compliance with basic infection control practices such as standard precautions is a simplest way of controlling spread of hospital acquired infections. A one day hands on infection control workshop was conducted at National Institute of Blood Diseases in April 2017. The nursing staff (NS; n=51) and allied healthcare professionals (AHCP; n= 24) at the institute were requested to participate in this study. The participants were informed verbally and asked to fill out a short questionnaire right before starting and at the end of the workshop to evaluate their knowledge and performance/attitude towards general infection control practices. The response rate, mean and standard deviation of each test score were determined using SPSS version 23. There was a significant difference between the pre-workshop and post-workshop test scores for nurses ($p<0.001$).The score for AHCP was comparatively better than the nurses in pre-workshop test with an average of 11.25±1.11. Although the result for the AHCP improved in post-workshop but difference between the mean scores was statistically insignificant ($p=1$). Gaps in knowledge and attitude/ performance were observed based on percentage of right answers in both categories but a significant difference $p=0.0042$ was observed in performance and attitude category in post workshop test scores. It can be concluded that educational session along with hands on workshops can be a significant tool in building a culture of safety environment in a hospital.

KEYWORDS: Infection, Nursing Staff, Healthcare Professionals, Performance/Attitude, Workshops, Hospital.

Introduction

Hospital acquired infections (HAIs) have been reported as one of the cause of adverse outcomes in most disease conditions. The HAIs are the major cause of prolonged hospitalization, increased hospitalization cost and even mortality. Patients particularly suffering from hematological malignancies or aplastic anemia etc often receive chemotherapy with bone/stem cell transplant as part of treatment regimen. These immuno-compromised patients are generally placed in isolations with controlled air pressures and designated staff to avoid HAIs. Despite strict regulations patients acquire HAIs even in these wards as reported in other studies[1-4]. As an infection control initiative, blood and body fluids from any patients should be considered as potentially infective material thus standard precautions should be taken to avoid spread of infection at any possible instance. Compliance with standard precautions plays an important role in preventing HAIs in these isolation wards[6,7]. Standard precautions include considering strict hand hygiene compliance, proper use of personal protective equipments (PPE), safe injection practices, infection control measures during lumbar puncture procedures, cough etiquette, proper waste management and disposal[10]. WHO recommends training of staff regarding standard precautions with special emphasis on hand hygiene[12]. Hands are the commonest vehicle for transmission of infections in closed isolation settings. Literature supports the efficacy of education and hands on trainings in improving the overall rate of infections in different healthcare facilities worldwide.

The main purpose of this study was to determine the level of knowledge of standard precautions/infection control practices as well as to determine performance/attitude towards these.

Material And Methods:

National Institute of Blood Disease & Bone Marrow Transplantation (NIBD), Karachi, Pakistan is a teaching general hospital which provides medical care for patients. This interventional study was performed during and at the end of a hands on workshop on infection control held at NIBD in April 2017. About 73 health care professionals participated in the workshop altogether. The participants were broadly divided into two categories i.e. nursing staff (NS=51) and allied health care professionals (AHCP=24). The NS included 9 registered nurses, 23 certified nurses and 19 nursing assistants while AHCP included 11 doctors, 6 pharmacists, 4 laboratory technologists, 2 faculty members and 1 administrative officer respectively.

Ethical approval was taken from the institutional ethical committee prior to workshop while verbal consent to fill out a self-reported questionnaire was taken from the participants at the beginning of the workshop (Table-1).

The questionnaire was specially designed containing 14 questions altogether to cover areas of knowledge and performance/attitude towards standard infection control practices with equal distribution of questions i.e. 7 for each category. The participants filled out these 14 questions questionnaire at the beginning and end of the workshop. The answers were marked as "right", "wrong" or "no answer". The response rate, mean and standard deviation of each test score were determined using SPSS version 21. The significant difference between the two tests were calculated by Students t-test. The level of significance was set at 5% for all observations.

Results

The rate of response to questionnaire was good i.e. 93.33% (70/75). There was a significant difference between the pre-workshop and post-workshop test scores for nurses($p=0.0058$; Table-2). The score for AHCP was comparatively better (11.25 ± 1.11) than the nurses (9.81 ± 2.34) in pre-test (Table -2) Although the score for the AHCP improved in post test (12.1 ± 0.85) but difference between the mean scores was statistically insignificant ($p=1$). Gaps in knowledge and attitude/ performance were observed based on percentage of correct responses to questions in both categories. Frequency of right response to questions in pre-workshop and post-workshop test was lower in attitude/ performance category in both groups. A significant difference $p=0.0042$ was observed in performance and attitude category in cumulative post workshop test scores of all participants (Figure-1).

Table 1: Knowledge and performance/ attitude questions

Knowledge Questions	Performance and attitude questions
1. Standard precautions are precautions taken to reduce the transmission of infections	1. PPE like gloves and gowns should not be worn in corridors, staff room, office or linen room etc.
2. The hand washing is an effective substitute for use of gloves	2. Masks and goggles must be worn for care activities such as care of patients who have a cough.
3.The objective of standard precautions is infection prevention inside a hospital	3. Hands must always be washed after removing gloves.
4. The use of personal protective equipments along with hand washing is effective in infection control.	4. In a hospital, standard precautions are the responsibility of nurses and doctors only.
5. Microorganisms can spread through food, drinks, water and fomites etc	5.Effective hand washing should be performed for 30-40 seconds with use of friction to clean between fingers, palms, nail beds, back of hands and wrists
6. Hands cannot be cleaned with alcohol-based hand gel if visibly dirty.	6. You should wash your hands before/after: preparing food, taking off gloves, entering into a patient's room.
7. All the hospital staff is responsible for cleanliness within the hospital to control spread of infection.	7. No objects like rings, watches nail art etc are allowed when you are bare below the elbows.

Table2: Test scored of workshop participants

Workshop Participants	Pre-workshop test Mean Score±SD	Post-workshop test Mean Score±SD	p-value
NS	9.07±2.35	11.41±1.57	0.0058
AHCP	11.25±1.11	12.1±0.85	1.00
NS=nursing staff; AHCP= allied healthcare professionals			

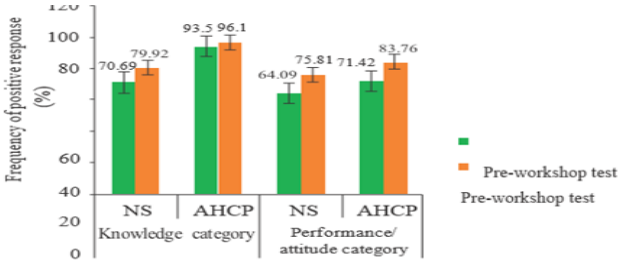

Figure 1: Frequency of positive response to the knowledge category and performance/attitude category of questions in pre-workshop and post-workshop tests by nursing staff (NS) and allied health care professionals (AHCP).

Discussion

There are multiple factors which contribute significantly to occurrence and persistence of HAIs in healthcare facilities[7]. The nurses and patients are the highly susceptible group to HAIs due to continued risk of exposure to pathogen[9]. Non compliance of healthcare workers with good infection control practices or basic standard precautions is the commonest factor[2,3,6]. The reported reasons for non compliance byhealthcare workers are: over-occupied staff with multiple responsibilities expressing shortage of time, natural skin irritation due to rubber or latex in PPE, absentmindedness due to lack of training and knowledge. In a recent study Vincent et al., suggested that training regarding standard precautions particularly of hand hygiene during and after patient care may reduce HAIs[11]. The rate of hand hygiene isestimated to be less than 50% in most studies[3,4]. Brevidelli and colleagues quoted a 38.5% global compliance rate for standard precautions owing greatly to personal and organizational factors[5]. Educational workshops and availability of required resources like availability of hand rubs, soap and paper towel etc. have been a proven source of betterment in the compliance rate as reported in earlier studies[4,5]. During the present study the observed rate ofpositive response to performance and attitude category questions was lower than the knowledge category (Figure 1).In a qualitative study with a focus group Efstathiou et al noticed low or nonexistent adherence to standard precautions despite prior knowledge by the nursing staff [6].

There was a significant difference (p=0.0058) in response to knowledge and performance /attitude category right after the workshop among NS (Table-2). Adly et al also observed a significant difference in knowledge of aims and indications of standard precautions among nurses with a response rate of 91.7% and 63.3% immediately after the interventional training compared to 83.3% and 38.3% at three months follow up[1]. It was interesting to note that the mean score for the registered nurses in pre-workshop and post-workshop tests was 8.75±1.83 and 11.37±0.51 (p=0.0016) while doctors had a mean score of 10.90±1.30 and 12.09±0.94 (p=0.024) respectively. These results are in contrary to other studies where compliance was higher in nurses compared to doctors[4,9]. Difference in the two tests scores indicates that the educational session with hands on workshop had a positive impact on the overall knowledge and attitude towards standard infection control practices. Continued educational and training modules are desirable. Such sessions will have positive impact on the goal of satisfactory implementation of good infection control practices at NIBD. Furthermore, planned and structured training cum teaching models should be followed to achieve this goal.

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