



Effect of In-Service Education Workshop on Occupational Health and Safety In Terms of Knowledge and Awareness among Nurses in a Selected Tertiary Care Hospital in India: An Evaluation

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Abstract

Background: Nurses are frequently exposed to occupational hazards in terms of blood borne infections during daily patient care activities in hospitals from low income countries like India and South Africa. Knowledge and awareness related to occupational health and safety can make them cautious and observe standard safety measures effectively and protect them from acquiring blood borne infections.

Objective: To evaluate the effect of in-service education workshop on occupational health and safety in terms of knowledge and awareness among nurses in a tertiary level care facility of India.

Methods: Using a pre-experimental research design, knowledge and awareness of 49 conveniently enrolled nurses on occupational health and safety was evaluated before and after a one day in-service education workshop organized at a single centre study in. Pre-tested and validated knowledge and awareness questionnaire ($\alpha=0.85$) related to occupational health and safety was used along with subject data sheet for the data collection.

Results: Majority of nurses (75.7%) were more than 30 years with the mean age and range 37.2 ± 7.7 , and 25-51 respectively, females (93.9%), having diploma in nursing as professional qualification (69.4%), nearly 50% of nurses were holding the designation of sister grade –II and equal number were holding administrative posts. Majority of nurses (73.5%) were vaccinated against hepatitis B and 26.5% of nurses had sustained needle stick injuries during patient activities and all received primary first aid care in terms of wound cleaning using soap and water and none received the post exposure prophylaxis. All nurses had attended one or more in-service education program on infection control and prevention. Baseline knowledge and awareness scores of the nurses were 36.1 ± 8.9 (11-52, max score 69). There was significant difference between the pre and post workshop knowledge and awareness scores of nurses (36.1 ± 8.9 vs. 55.1 ± 7.1 , $p<0.001$).

Conclusion: The majority of nurses were lacking knowledge and awareness regarding occupational hazards, and this lack was corrected after the in-service education workshop.

Recommendations: Periodic in-service training courses on occupational health and safety should be provided in order to keep the nurses' knowledge and awareness updated regarding occupational health and safety.

Keywords

In-service education workshop; Occupational health and safety; Knowledge and awareness of nurses

Introduction

Occupational health and safety are considered to be important issues in a health sector from a low income country like India. The World Health Organization estimates that there are about 3 million health care workers (HCW) facing occupational exposure to blood borne viruses each year (2 million to HBV, 900,000 to HCV, and 300,000 to HIV). Majority infections (90%) that result from these exposures are reported in low income countries like Asia and South Africa [1].

Health care workers (HCW) in general and nurses in particular are vulnerable to various occupational hazards like blood borne infections (Hepatitis B, Hepatitis C, HIV in low income countries like India. Blood borne infections risk can be minimized by using safe work practices. The WHO (2002) classified occupational hazards in health care facilities (HCFs) as physical, biological, mechanical, ergonomic, chemical and psycho-social ones [2]. The main biological hazards to HCWs include blood-borne infections namely Human Immunodeficiency Virus (HIV), Hepatitis B virus (HBV) and Hepatitis C virus (HCV) as a result of exposures to needle-stick injuries or cuts from other sharp instruments like surgical blade. Patients' blood/body fluids contact with HCW's eyes, nose, mouth, or skin can also make them the victims of the occupational hazards [3].

An "occupational exposure" that may place HCW at risk of blood borne infection is defined as a percutaneous injury either through needle stick or cut with a sharp instrument or contact with the mucous membranes of the eye or mouth, or contact with non-intact/intact skin resulting into contact with blood or other potentially infectious body fluids [4]. There are approximately 2.5% of HIV cases, 40% of HBV and HCV cases worldwide resulting from occupational exposure among health care workers, as reported by WHO [5].

Health care workers are being exposed to blood and body fluids every day during patient care activities. The common occupational accidents like needle stick injuries, cuts and splashes are exposing health care providers to different blood borne pathogens. The transmission of Hepatitis B virus, HIV and HCV has been directly related to injuries and frequency of exposure and can be prevented to great extent by taking precautions [3].

US Centre for Disease Control and Prevention (CDC) has developed standard safety precautions for preventing blood borne infections and handling of infectious materials in HCFs. Adherence to the standard safety precautions guidelines can prove to be effective

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in minimizing occupational hazards and promoting safety among the health workers [6].

A number of studies from developing countries have examined knowledge, attitude related to occupational health and safety and infection control practices [7,8] that indicate inadequate knowledge and awareness among HCWs related to occupational health and safety. Lack of knowledge and awareness on these issues can further adversely affect the safe work practices of the HCWs and making them vulnerable to blood borne infections. Therefore, frequent on job in-service training workshops on occupational health and safety can prove to be very beneficial in safety and promoting occupational health among the health workers. The present study aims to evaluate the effect of the in-service education workshop in terms of knowledge and awareness of nurses regarding the occupational health and safety.

Material and Methods

This cross-sectional pre-experimental study was conducted in January- February 2016 among 49 conveniently enrolled nurses in a selected tertiary level care facility as part of in-service education activity. Ethical clearance was obtained from the ethics committee of the institute. Written informed consent was taken from nurses for the participation; it was assured to them that the findings would be used for the research purpose only.

The mean knowledge and awareness score of the nurses in infection control in an initial pilot study was 5.17 ± 2.47 (2-9.5, max score 10). We considered a rise of the score to 7.0 as a reflection of improved knowledge and awareness. With 90% power at 0.5 level of significance, the expected sample size was 21. Due to easy availability of 49 nurses, all were enrolled for the study.

Baseline knowledge and awareness scores of the nurses on occupational hazards were collected, which was followed by a one day in-service education workshop on occupational hazards, consisted of didactic lecture on hepatitis B, C and HIV/AIDS, possible modes of transmission of those infections among health workers with the help of power point presentations and the demonstration on safe practices related to injection administration was held. The tool had total 69 items (True/False/do not type) covering various aspects of occupational hazards like type of blood borne infections, mode of transmission, standard safety precautions and post exposure prophylaxis etc. Some of the questions to cite are 'occupational exposure in the health care setting occurs as a result of injury with needle or any sharp contaminated instrument', the risk of transmission of blood borne infections among HCW and patients depends upon the individuality infectivity (viral load), clinical context, technical skills and the hospital environment etc. A score of one was given for a correct response and a score of 0 was given for the incorrect response and the maximum possible score was 69. Overall knowledge and awareness scores were graded as excellent (≥ 60), good (50-59), medium (40-49) and poor (<40). The lecture focused on occupational hazards, common blood borne infections, mode of transmission of infection, preventive measures and post exposure prophylaxis (PEP). The tool and didactic lecture content on power points [9] were validated by the experts of infection control department and hospital administration.

Outcome assessment

Primary outcome was the improvement in knowledge and awareness scores on occupational health and safety as assessed by the knowledge and awareness questionnaire.

Data analysis

Collected data was coded and entered into Microsoft excel sheet and analyzed using SPSS 23.0. Mean and standard deviation for knowledge and awareness scores were computed. We used paired t test, for establishing the significance of score gains. The level of significance was set at 0.05 level ($p < 0.05$).

Results

Forty-nine nurses [age (years), mean \pm SD, median, range, 37.2 ± 7.7 , 21, (25-51)] from different medical and surgical wards of a tertiary level care facility participated in the workshop. Majority of nurses were diploma holder in nursing (67.3%), females (93.9%) from urban area (85.7%) and nearly half of the nurses were holding the designation of sister grade –II (doing bedside nursing). Majority of nurses (73.5%) vaccinated against Hepatitis B and median years lapsed after receiving the hepatitis B vaccination was 7. Nearly one fourth of nurses had one or more needle stick injuries while working in the facilities (Table 1).

Before the workshop majority nurses had poor (61.2%) or medium (30.6%) knowledge and awareness scores and after the workshop majority nurses had excellent (26.5%) or good (51.1%) knowledge and awareness scores related to occupational health and safety.

In the present study majority nurses (80%) expressed that the occupational exposure in the health care setting occurs as a result of injury with needle or any sharp contaminated instrument, while 20% believed that contamination of the mucus membrane of eyes, nose, and mouth can also be responsible for the infection. The risk of transmission of blood borne infections among HCW and patients depends upon the individuality infectivity (viral load), clinical context, technical skills and the hospital environment. Nurses in our study felt that individual infectivity is the major deciding factor for the transmission of infections among HCWs and patients. Major risk factors for blood borne infections in developing countries are unnecessary injections, frequent use of unsterile needles and inappropriate hazardous waste disposal. In the present study majority of nurses (84%) opined that frequent use of unsterile needles is the only risk factor for blood borne infections.

Safe injection is also playing important role in preventing blood borne infections. Safe injection is the one that does not cause any harm to the recipient and also does not expose the provider or other people to any kind of risk. Our findings reveal that majority nurses (84%) considered a safe injection that does not cause any harm to the recipient.

Appropriate protective measures like use of standard safety precautions including use of personal protective equipment's, immunization against hepatitis B are required to be observed at the time when a patient has sustained injuries, undergoing minor procedure like tooth extraction or any surgery even just before death, postmortem examination. In the present study majority of nurses (76%) felt that appropriate protective measures are to be observed when a person has sustained injuries or undergoing surgery. Significant number of nurses (68%) did not know about the fact that a combination of hepatitis B immunoglobulin prophylaxis and hepatitis B vaccination is 85-95% efficacious in preventing HBV infection and similar number of nurses did not know about how the interpretation of viral markers is done, in case of their exposure to any source of HBsAg positive infection?

Table 1: Demographic profile of nurses working in various medical and surgical wards (n=49).

S.No.	Variable	f (%)	
1	Age (mean age) range	37.2 ± 7.7 (25-51)	
2	Age (Years)	21-30	12 (24.5)
		31-40	18 (36.7)
		>40	19 (38.8)
3	Residence	Urban	42 (85.7)
		Rural	7 (14.3)
4	Professional Education	Diploma	33 (67.3)
		BSc (Nursing)	15 (30.6)
		MSc Nursing	1 (2.1)
5	Area of work	Medical ward	15 (30.6)
		ICU	10 (20.4)
		OT	5 (10.2)
		Surgical ward	19 (38.8)
6	Designation	Sister grade –II	24 (49.0)
		Sister grade –I	20 (40.8)
		Sister-Incharge	5 (10.2)
7	Mean professional experience (years), range	13.7 ± 7.2, (2-29)	
8	Mean experience in the present area (years)	6.6 ± 4.8 (0.6-20)	
9	Attended at least in-service education on infection control	Yes	49 (100)
		No	0
10	Vaccinated against hepatitis B	Yes	36 (73.5)
		No	13 (26.5)
11	Years lapsed after vaccination (Median)	6	
12	Needle stick injury (NSI)	Yes	13 (26.5)
		No	36 (73.5)
13	Treatment taken for NSI (n _i =13)	Wash with soap and water and antiseptic application	13 (100)
		Chemo-prophylaxis	0

Majority nurses (>80%) knew that no PEP is available for protecting against HCV infection, however tests for anti HCV antibodies and the liver functions are carried out to monitor the HCW, if the source of infection is HCV positive. Similar number of nurses knew that post exposure prophylaxis following exposure to HIV infection requires initiation within 72 hours of exposure.

The workshop resulted in significant improvement in knowledge and awareness scores (35.4 ± 10.3 vs. 54.9 ± 7.1, maximum marks 69; mean difference 18.9, 95% CI 15.9-21.9, p<0.001) (Table 2). The program was effective in improving the knowledge and awareness of nurses regarding occupational health and safety.

Discussion

Findings of the present study reveal that half of the nurses were providing direct patient care. Majority of nurses were vaccinated against hepatitis B and one fourth of nurses had sustained needle stick injuries during patient activities and all received primary first aid care in terms of wound cleaning using soap and water and none received the post exposure prophylaxis. All nurses had attended at least one in-service education workshop on infection control and prevention. The in-service education program was effective in improving the knowledge and awareness of nurses on occupational health and safety.

Occupational health and safety issues are gaining popularity in the hospital setup due to emergence of blood borne infections in HCWs and the long term effects of these infections on them. In the present study nurses working in various medical surgical wards, ICUs and OTs in general had poor to medium knowledge and awareness scores,

similar results were reported by Lugah V et al. [10], while in contrast Manuel M et al. [11] concluded that majority of the respondents were knowledgeable about the occupational health hazards and safety measures.

In hospital setup no HCW in general and nurse in specific should not work without adequate safety measures. Taking hepatitis B vaccination is very much essential and should be mandatory for all HCWs. In our study one quarter of nurses were not immunized against Hepatitis B. Administrative steps should be taken to ensure that all HCWs get immunized against hepatitis B before they are placed in the patient care area. Written guidelines related to occupational health and safety can be made accessible to all the nurses in their area of work. Orientation program for the newly appointed nurses should have the component of occupational health and safety.

The program was effective in improving the knowledge and awareness of nurses regarding occupational health and safety. This finding is in agreement with Abouelhamd [12] Stephenie [13] Al Yousef [14] who found that higher level of knowledge towards standard safety measures, and infection control practices in the post intervention phase as compared with the pre intervention phase.

Present study has few limitations. Pre-experimental design, sample of convenience used for selection of nurses and absence of control group limits the generalizability of the study. In our study only knowledge and awareness of nurses regarding occupational health and safety were assessed that too immediately after the study. There is a possibility of having the spillover effect. Knowledge and awareness of the nurses related to the topic can be evaluated after some time interval to see the actual retention of knowledge. Another

Table 2: Pre and post workshop knowledge and awareness scores of nurses (n=49).

Knowledge and awareness scores categories	Pre-workshop f (%)	Pre-workshop knowledge scores (range)	Post-workshop f (%)	Post workshop knowledge scores (range)	Mean difference	CI	p value
≥ 60 (Excellent)	0	36.2±8.9 (11-52)	13 (26.5)	55.1± 7.1 (34-65)	18.9	15.9- 21.9	0.001
50-59 (Good)	4 (8.2)		25 (51.1)				
40-49 (Medium)	15 (30.6)		8 (16.3)				
<40 (Poor)	30 (61.2)		3 (6.1)				

study can be done to evaluate the practices of nurses along with knowledge and awareness related to occupational health and safety. Periodic refreshing in-service workshop and training courses should be provided to the nurses to update their knowledge so that they can make their work practices safe.

Conclusion

The majority of nurses were lacking knowledge and awareness regarding occupational hazards, and this lack was corrected after the in-service education workshop.

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