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Prevalence of needlestick injury and nursing practices regarding safe injection and sharp disposal while working in critical care settings of two tertiary care hospitals

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ABSTRACT

This observational cross-sectional study design (Pilot) was conducted to assess the prevalence of needle stick injury (NSI) and nursing practices regarding safe injection and sharp disposal in critical care units of two tertiary care hospitals from 1st July to 30th August 2014. Data was collected using a self-developed questionnaire about the prevalence of NSI and nurses' practices regarding safe injection and sharp disposal after a thorough literature review and then was given to the expert for review. Finally, the data was collected from the participants after verbal consent. The study result showing that about half of the nurses have no knowledge regarding the disposal of sharp and it has been found that 47.8% re-cap the needle before disposal. While 32.6% reported needle prick injury. The study concluded that inadequate knowledge among nurses about safe nursing practices and lack of using preventive measures from NSI were identified. Lack of reporting is also a factor identified in this study.

Keywords: Needlestick injury, disposal of used syringes, safe healthcare practice, hospital-acquired infections

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INTRODUCTION

Needlestick injury (NSI) means the introduction of blood/body fluids via a needle or pointed instruments such as syringes, lancets, scalpels, and broken glass into the body of healthcare professionals (HCPs) (1). NSI can be avoided by practicing the guidelines of universal precautions (2,3). There is a need to estimate the prevalence of NSIs and practice of nurses regarding sharp disposal because it has been found that more than 50% pathogens transmission was reported, in which Human Immunodeficiency Virus/Acquired Immune Deficiency Syndrome (HIV/AIDS), Hepatitis B, and Hepatitis C have increased risk (2). A study was carried out for assessing the factors associated with the NSI in which they identified the overcrowding of patients in the ward, increased work burden, non-compliance with Standard Precautions (SPs), and non-cooperative patients are the main factors responsible for NSI (4). Therefore, this study aims to assess the prevalence of NSI and nursing practices regarding safe injection and sharp disposal working in critical care of two tertiary care hospitals. The practices used to prevent the spread

or inhibit the micro-organism in the health care setting are known as infection control measures. The rate of Hospital Acquired Infections (HAIs) cascades up to 40%. Lacking in the infection control measures among HCPs can become the reason for increased chances of infections, the overall cost of the treatment as well as hospital stay (5-7). Conversely, lengthy hospitalization can also become the risk for patients to develop adverse effects including HAIs. Timely discharges play an important role in preventing HAIs and NSI etc (6, 8).

Centre of Disease Control and Prevention (CDC) notified that the HAIs can be controlled if SPs are carried out which include hand hygiene, use of Personal Protective Equipment (PPE), proper use of sharps and its disposal, patient placement in wards, patient's environment including linen and waste management (9). HCPs expressed that the use of PPE often creates hindrance while performing nursing skills. They feel burden by wearing masks, gowns, and gloves, etc while offering care to patients. Besides, the use of PPE such as donning and doffing is a lengthy procedure and consuming time which could be one of the barriers leading to non-compliance with SPs (10).

METHODOLOGY

In this observational cross-sectional study, the data collected from the nurses working in the Intensive Care Unit (ICU) and Emergency Department (ED) of two tertiary care hospitals of Karachi Pakistan between 1st July and 30th August 2014. The inclusion criteria comprise of nurses currently on the job while the nurses on leave were excluded from the study. Data was collected by the self-developed questionnaire including the variables; exposure to NSI, NSI due to poor disposal of the needle, nonreporting of NSI, availability of sharp boxes, working days incidents, assistance in the disposal of sharp, needle recapping, needle removing with a gloved hand or forceps, labeling of the sharp box before disposal, vaccination of HCPs and treatment of HCPs in case of NSI. The questionnaire was developed after a thorough literature review and then was given to the expert for review. The data was collected from the participants by the primary investigator itself after taking verbal consent and ensuring confidentiality.

DATA ANALYSIS

The data were entered twice to minimize the risk of error and the frequencies were calculated. And the analysis was done using the software Statistical Package for Social Sciences (SPSS) version 20. Descriptive statistics (frequencies and percentages) were calculated to identify the prevalence of NSI.

RESULTS

A total of 100 Registered nurses were taken for the study and were assessed for calculating the prevalence, and risk of NSIs among nurses working in

critical care units of two different hospitals which indicates that 33 (33%) participants exposed to NSI in previous 12 months. When the participants were asked about the cause of recent NSI, 17 (17%) participants had NSI due to poor disposal of sharp while 35 (35%) had NSI due to individual carelessness or accidentally. In this study, 35 (35%) participants did not report any NSI while only 28 (28%) participants fill the incident report. The participants were asked about the availability of the sharp box at the time of NSI, 35 (35%) participants denied the availability of sharp box. When the participants were asked about the day by which they exposed to NSI 52 (52%) replied that they were exposed to NSI on working days. When the participants were asked about the procedure of incident report for the nature of NSI, half of the participants (52%) replied that the incident should be reported if the NSI occurs with both used and unused needle. It also shows that 89 (89%) participants are those who are assisted by someone else in the removal or disposal of needles. 48 (48%) participants recap the needles after administering the drugs. Only 17 (17%) are the participants who separate the needle from the syringe with the help of Forceps while 37 (37%) and 31 (31%) participants do it with Gloves hand and bare hands but with caution, respectively. While only 15 (15%) participants never separate the needle from the syringe. Only 19 (19%) participants stated that the sharp box should be properly labeled before disposal. More than half (56%) of the participants are fully vaccinated against Hepatitis B. When the participants were asked about the training for the prevention and treatment of NSI, 52 (52%) replied that they never attend any training.

Table I: Showing the prevalence and risk of Needle Stick Injury (N = 100)

Nurses exposure to NSI	n	%
Nurses who have exposure of NSI in last 12 months	33	33
Recent incident of NSI happen due to poor disposal of needle	17	17
Recent incident of NSI happen due to individual carelessness/accident	35	35
In case of needle stick injury, report to infection control	15	15
No reporting in case of NSI	35	35
At the time of the incident, sharp box was available in ward	52	52
The exposure of NSI was between Monday-Friday	52	52
Both used and unused needle stick injury should be the option of an incident report	52	52
Nurses practices regarding safe injections and sharp disposal		
Nurses who assisted in the disposal or removal of the needle	89	89
Nurses who recap the needle after administering the injection	48	48
Nurses who separate the needle from syringe with the help of forceps	17	17
Nurses who separate the needle from syringe with the help of gloved hands	37	37
Nurses who never separate needle from the syringe	15	15
Nurses who separate the needle from syringe with the help of bare hands but with caution	31	31
Before disposing of the sharp box, make sure that it is properly labeled	19	19
Vaccination and training of nurses regarding the prevention and treatment of NSI		
Nurses fully vaccinated against Hepatitis B	56	56
Nurses did not receive training in the prevention or treatment of NSI	52	52

DISCUSSION

The current study showed that the injury is more often on weekdays and lack of training was recognized as the strongest risk factor for the mal-practices of nurses for safe injection and sharp disposal. While the published study reported that risk factors integrated long working hours, aspects related to working habits (i.e. recapping, not using gloves) (11). The current study suggests that NSIs could be significantly reduced by sufficient training on NSIs and following the guidelines of SPs as shown in the study that lack of training is associated with NSI (8). The current study shows that non-reporting of NSI is also crucial for HCPs as it can lead to increased NSI, therefore there is a need to report these cases to the related authorities so that they can facilitate and make appropriate counseling, prophylaxis or early treatment (12). One of the reasons for NSI was found in the current study that is the unavailability of sharp disposal boxes, therefore, for protecting the HCPs from NSI, the management of each organization needs to provide sharps disposal boxes and valuable safety programs. One of the major problems associated with the management of NSI identified as a lack of hard evidence relating to the actual numbers of incidents in an organization which is due to the under-reporting of exposure incidents (13, 14). The current study has multiple strengths such as the data was collected from the critical care units only because of their busy duty hours and HCPs often forget to take preventive measures for NSI, which put them in the risky situation for HAIs, as these critical areas are capturing the patients who are highly infective as well as vulnerable. Moreover, a universal sampling strategy gives strength to the study that it can be generalizable to the other settings of Karachi. Furthermore, the data was collected from registered nurses and doctors who are mostly involved in direct patient care. On the contrary, some factors were identified as a limitation of the study, such as the self-reported questionnaire was used for data collection which could be response bias. As the possibility for the participants to answer in an appropriate/correct way.

Conclusion

To conclude this study shows inadequate practices among nurses about safe injection and sharp disposal including recapping of used needles, not using protective gloves, unawareness about the proper disposal of the sharp box, and lacking safety-engineered products. Therefore, each organization needs to work on these highlighted factors to reduce the incidence of NSI and provide a safe environment for the HCPs as well as their patients.

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