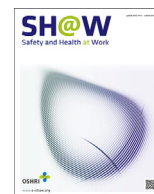




Contents lists available at ScienceDirect

# Safety and Health at Work

journal homepage: [www.e-shaw.org](http://www.e-shaw.org)

## Original Article

## Needle Stick Injuries and their Related Safety Measures among Nurses in a University Hospital, Shiraz, Iran



Mehdi Jahangiri<sup>1</sup>, Akbar Rostamabadi<sup>2,3</sup>, Naser Hoboubi<sup>3,\*</sup>, Neda Tadayon<sup>3</sup>, Ali Soleimani<sup>3</sup>

<sup>1</sup> Department of Occupational Health, School of Health, Shiraz University of Medical Sciences, Shiraz, Iran

<sup>2</sup> Department of Occupational Health, Ashtian Health Care Center, Arak University of Medical Sciences, Arak, Iran

<sup>3</sup> Student Research Committee, Shiraz University of Medical Sciences, Shiraz, Iran

## ARTICLE INFO

## Article history:

Received 11 May 2015

Received in revised form

30 June 2015

Accepted 19 July 2015

Available online 4 August 2015

## Keywords:

needle stick injuries (NSIs)

nurses

safety injection index (SII)

## ABSTRACT

**Background:** This study aimed to determine the prevalence and factors related to needle stick injuries (NSIs) and to assess related safety measures among a sample of Iranian nurses.

**Methods:** In this cross-sectional study, a random sample of 168 registered active nurses was selected from different wards of one of the hospitals of Shiraz University of Medical Sciences (SUMS). Data were collected by an anonymous questionnaire and a checklist based observational method among the 168 registered active nurses.

**Results:** The prevalence of NSIs in the total of work experience and the last year was 76% and 54%, respectively. Hollow-bore needles were the most common devices involved in the injuries (85.5%). The majority of NSIs occurred in the morning shift (57.8%) and the most common activity leading to NSIs was recapping needles (41.4%). The rate of underreporting NSIs was 60.2% and the major reasons for not reporting the NSIs were heavy clinical schedule (46.7%) and perception of low risk of infection (37.7%). A statistically significant relationship was found between the occurrence of NSIs and sex, hours worked/week, and frequency of shifts/month.

**Conclusion:** The study showed a high prevalence of NSIs among nurses. Supportive measures such as improving injection practices, modification of working schedule, planning training programs targeted at using personal protective equipment, and providing an adequate number of safety facilities such as puncture resistant disposal containers and engineered safe devices are essential for the effective prevention of NSI incidents among the studied nurses.

Copyright © 2015, Occupational Safety and Health Research Institute. Published by Elsevier. This is an open access article under the CC BY-NC-ND license (<http://creativecommons.org/licenses/by-nc-nd/4.0/>).

### 1. Introduction

Needle stick injuries (NSIs) are serious occupational hazards in the transmission of a variety of bloodborne pathogens such as hepatitis B virus, hepatitis C virus, and human immunodeficiency virus (AIDS) among healthcare workers (HCWs). The number of HCWs annually exposed to sharps injuries contaminated with hepatitis B virus, hepatitis C virus, and human immunodeficiency virus/AIDS has been reported to be 2.1 million, 926,000, and 327,000, respectively [1,2].

Certain work practices such as administering injections, blood sampling, recapping and disposing needles, handling trash, and

during the transfer of body fluid from a syringe to a specimen container are major activities causing NSIs [3].

Unsafe injection is one of the major risk factors in the occurrence of needle stick and other sharps related injuries in both HCWs and the general public. There is some evidence revealing a high prevalence of unsafe injection practices among HCWs in developing countries, where about 90% of accidents related to NSIs occur [4]. For instance, in India, Kotwal et al [5] reported a prevalence of 77.5%, and in China, Li et al [6] found a prevalence of 77.1% of unsafe injection practices among HCWs, including physicians. Furthermore, according to injection safety surveys conducted by the World Health Organization, on average, four NSIs occurred

\* Corresponding author. Department of Occupational Health, Shiraz University of Medical Sciences, School of Health, Koy-e-Zahra Street, PO Box: 71645-111, Shiraz, Iran. E-mail address: [hobobinaser@yahoo.com](mailto:hobobinaser@yahoo.com) (N. Hoboubi).

annually/HCW in the African, Eastern Mediterranean, and Asian populations [7]. It has been reported that unsafe injection practices in developing countries occur in 15–50% of cases [8].

Globally, it is estimated that out of the total of 35 million HCWs worldwide, 3 million experience NSIs every year [3,9]; of these, nurses are at the greatest risk, with up to 50% of all NSIs being sustained by this group [10,11].

While some studies have been conducted in developed countries investigating factors related to NSIs among HCWs in general, there are a few researches in literature addressing the predictors of NSIs in developing countries, specially focusing on nurses [4].

Nursing is a crucial occupation in Iran and nurses constitute the majority of the HCWs' force. However, the lack of safe sharps devices (devices with built-in safety features) and the high ratio of patients to nurses in the country's hospitals have imposed work environments characterized by a high potential in predisposing the nurses to risk of NSIs.

Although in recent years some efforts such as the establishment of occupational health and safety services within the Iranian hospital health system have been undertaken to protect nurses and medical staff from exposure to NSIs and other occupational health and safety hazards, data on the rate of incidence of NSIs and their related safety measures is very limited. In this context, the present study aimed to determine the prevalence and factors related to NSIs and to assess the related safety measures among a population of nurses working in one of the hospitals of Shiraz University of Medical Sciences (SUMS).

## 2. Materials and methods

This cross-sectional study was conducted from June 2014 to December 2014 among a random sample of 168 registered active nurses working in different wards in one of the hospitals of SUMS. The study inclusion criteria were only nurses who were at risk of NSIs with at least 6 months job experience. An anonymous questionnaire was used to obtain data on the prevalence and factors related to NSIs. The questionnaire consisted of two sections including items on the demographic characteristics (age, sex, education level, frequency of work shift/month, and the years of experience), and items on the frequency and factors related to NSIs (such as frequency of NSIs in the previous year, the shift of work when NSIs occurred, the type of device that caused the NSIs, reporting the NSIs, and reasons for not reporting the NSIs).

Injection safety was assessed by a checklist based observational method. A safety injection checklist (Appendix I), which is a detailed checklist developed and adapted by Iran's Ministry of Health and Medical Education for assessing injection safety among injection providers, was used to measure injection safety. The checklist consisted of 23 items/questions including items/questions on the safe injection practices taken during and after the procedure of injection, the provided safety facilities (such as safety box and Auto-Disable (AD) syringe needles), the personal protective equipment (PPE) used during and after the procedure of injection, and the preventive and treatment measures taken before and after the injury.

Based on the judgment of an expert panel consisting of four safety and occupational health professors from SUMS, each item/question was then scored as: 0 (unsafe behavior), 1 (deficient safe behavior), and 2 (completely safe behavior). Finally, percentage of injection safety was calculated by the safety injection index (SII), as in the following equation:

$$\text{Safety Injection Index (SII)} = \frac{\sum x}{46} \times 100$$

where  $x$  = score of each question and 46 = maximum score of questions ( $23 \times 2 = 46$ ).

**Table 1**  
Demographic characteristics of the studied population ( $N = 168$ )

Characteristics	$n$ (%)	Mean (SD)
Sex		
Male	46 (27.4%)	–
Female	122 (72.6%)	–
Education level		
High school diploma	15 (9%)	–
Assistant degree	11 (6.5%)	–
BSc	136 (81%)	–
MSc	6 (3.5%)	–
Age (y)	–	29.67 (7.88)
Work experience (y)	–	7.1 (7.03)
Frequency of shifts/mo	–	21.29 (7.7)
Working hours/wk (h)	–	45.86 (11.61)
Patients treated/d	–	12 (6.76)
Number of injections/d	–	5.18 (3.03)
Safety injection index (SII) (%)	–	66.01 (12.23)

SD, standard deviation.

The study protocol was approved by SUMS ethics committee and all nurses were informed about the objectives of the study and were asked to provide written consent prior to the start of the study.

### 2.1. Statistical analysis

Data were analyzed using the software package SPSS version 13 (SPSS Inc., Chicago, IL, USA). The independent  $t$  test, Chi-square test and Mann-Whitney test were used to examine the relationship between NSIs and demographic characteristics and the SII. In order to adjust for potential confounding, multiple logistic regression analysis was performed for each outcome retaining variables in the model. A  $p$  value  $\leq 0.25$  based on univariate analysis such as the Chi-square test and independent  $t$  test was considered as a potential factor in the logistic regression model.

## 3. Results

The mean age of nurses was 29.67 years [standard deviation (SD) = 7.88]. The proportion of female and male nurses was 72.6% and 27.4%, respectively, and most had a BSc degree in nursing with a mean work experience of 7.1 years. Table 1 shows other details of the demographic characteristics of the studied population.

Table 2 presents the frequency and factors related to NSIs. A total of 128/168 (76%) of the studied nurses reported at least one NSI in the total of their job tenure, and 69 individuals (54%) experienced at least one NSI in the previous year.

Disposable syringe needles and intravenous catheter stylets were the most common devices involved in the injuries; 110/128 (85.5%) cases of NSIs which occurred were induced by these devices. The majority of NSIs occurred in the morning shift (57.8%) and the most common activity leading to NSIs was recapping needles (41.4%). Washing the injury site with soap and running water (70.2%) was the first treatment after injury, followed by pressing the injury site (9.3%). Furthermore, the major reasons for not reporting NSIs were heavy clinical schedule (46.7%) and the perception of a low risk of infection (37.7%).

The relationship between individuals who had been injured and who had not been injured with needle sticks based on demographic characteristics is presented in Table 3. A statistically significant relationship was found between the occurrence of NSIs and sex, hours worked/week, and frequency of shift/month ( $p < 0.05$ ). In the next step of analysis, demographic variables that reached values of  $p < 0.25$  were considered as potential factors into the second phase of analysis, i.e., multiple logistic regression analysis. Table 4 shows

Download English Version:

<https://daneshyari.com/en/article/1091992>

Download Persian Version:

<https://daneshyari.com/article/1091992>

[Daneshyari.com](https://daneshyari.com)