



## Original Article

### Assessment of Nursing Staff Knowledge and Practices Regarding Needle Stick Injuries (NSIs) in Al-Lieth General Hospital: A quality control study.

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#### Abstract

**Background:** NSI which is known as Needle Stick Injuries can cause accidental exposure to serious blood borne diseases. It is very common in HCWs (Healthcare Workers). The nurses who have temporary disability are more able to get needle stick incidents and occupational accidents. But these injuries and NSI can cause this temporary disability turn into permanent disability because of the transmission of diseases like AIDS and serum hepatitis. Nurses are the important part of any hospital and they play an important role in preventing and managing NSI.

**Aim:** The aim of this study and research is to judge the knowledge and skilled practices of the nursing staff about NSI (Needle Stick Injuries).

**Methods:** The sample comprised of total 150 nurses including both females and males collected from Emergency Room, Hemodialysis Unit, ICU (Intensive Care Unit), Surgical and Medical Wards of Al-Lieth General Hospital.

**Results:** Our study exposed that the age of the 52.7% nurses were 25 to 30 years and the age of the 2% of the nurses were <20 years. There was a difference between total score of nurse's knowledges and their practices about NSI. 88% of the nurses had knowledge and skilled practices while rest of the nurses had no knowledge and no skilled practices about NSI preventions and management.

**Conclusion:** The NSI between nurses and the practices of recapping needles increases the probability of NSI. The nurses had knowledge and skilled practices while only some of the nurses had incompetent practices about NSI preventions and management.

**Key words:** Assessment, Follow-up, Infection, Knowledge, Nurses, Needle Stick Injury (NSI), Quality Control.

#### Introduction

A Needle Stick Injury (NSI) is a type of injury that is self-inflicted or by other means in which the skin is wounded and punctured. Any Health Care Worker (HCW) working with or using sharp tools or instruments during procedures are generally prone to needle stick injury. Operating rooms are the areas with the most considerable risk of this injury. These injuries mostly occur while cleaning or recapping sharp tools or needles.<sup>1,2</sup>

Among nurses, needle stick accidents and injuries are the most common. These injuries may cause severe disabilities or transmission of diseases like AIDS, serum hepatitis, and syphilis due to contaminated needles of infectious patients.<sup>3,4</sup> Nurses and other HCWs every day are risking themselves by working around these contaminated needles or blades exposed to patients of viruses like Human Immunodeficiency Virus (HIV) and hepatitis.<sup>5,6</sup>

Exposing HCWs unexpectedly to blood borne diseases is very common by NSIs. These people are more likely to gain pathogens, from needles, that is through the hospital-acquired transmission. Most (90%) of the NSIs happen to nurses working in third world countries, having low resources, lack of training, and knowledge. Each year almost 2 million HCWs are reported with NSIs as these are only the reported cases. Many unreported cases are up to 40-70%.<sup>7-9</sup>

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Almost 80% of HIV risk can be dealt with using antiretroviral medications. A project was launched in 2003 by the World Health Organization (WHO) and the International Council of Nurses to safeguard the HCWs from NSIs. The news of this project circulated throughout the world with policies and practices for prevention.<sup>10</sup> Additionally, a few methods were employed to avoid infections from occurring to HCWs included; avoiding unnecessary injections, immunity against HIV, disposing of sharp and used needles, eradicate needle recapping, carry out universal protocols and precautions, using Personal Protective Equipment (PPE), using devices that are safer like needles that retract after use and training workers on the risk and prevention of Transmission.

In averting NSIs, nurses play an essential role. Inspire the staff and nurses to mention any injury that occurs so that it may be treated correctly and on time; demand phlebotomy teams for decreasing workload on staff; develop organize skills like having all items required for any procedure to be present on a tray or basket, thus saving time that's used up in those trips to supply area; minimize any disturbance or distractions during work. Nurses are always available during clinical hours, insistent promotion for safe practice by utilizing protective devices, using safe disposal methods, and encouraging the use of new protective devices. A safe protective environment can be promoted.<sup>1</sup>

### Significance of the problem

The common causes of fatal diseases and injuries are due to NSIs between different HCWs. All around the world, many HCWs endure exposure to NSIs while taking care of their patients. These injuries resulting from NSI can cause lethal blood-borne pathogens, leading to hepatitis and HIV/AIDS. These infections affect patients and nurses, including the community they are in, acting as a burden on hospitals, disturbing the quality of life of people and nurses, and increasing cost. In this, better judgment, care while cleaning tools, training, dodging practices like recapping needles and making safer needles to avoid injury and disease.

### Aim Of The Study

This study and research aimed to estimate the amount of knowledge retained in the nurse staff and their practice related to prevention management and follow up for NSIs.

### Subjects And Methods

#### I-Technical Design

##### A - Research Design

The design was a detailed study.

#### B- Research Settings

This study was carried out in ICU, Hemodialysis Unit, Emergency Room, Medical, and Surgical Wards associated with Hospitals.

#### C - Research Subjects

A total of 150 nurses' samples were taken from the study mentioned above settings.

#### D - Tool of Data Collection

Needle Stick Injury Prevention Assessment Tool (14): It was adopted (WHO, 2008) and altered by the researchers to be in line with the current study and have validity from Nursing Department at Health Sciences college, Lieth in Umm Al-Qura University. Researchers used this individually to note the practice and training of nurses related to NSI. It included the following:

- **Part 1:** Socio-demographic information of Nurses including personal data (age, gender, years of experience, level of education)
- **Part 2:** Concerned with Attendance of Previous Training Program and Work Place.
- **Part 3:** Concerned with nursing staff knowledge (definition, causes, and investigation required after NSA).
- **Part 4:** Concerned with Nurse Staff practices regarding Management, Prevention, and Follow up for NSI.

#### Scoring Systems

- Nurses' practices score was 21 grades (equal 100%), and the nurses' answers were accordingly categorized into competent practice (75% and more) or incompetent practices (less than 75%).
- Nurses' knowledge score was 30 grades (equal 100%), and their answers were accordingly categorized as satisfactory knowledge (more than 60%) and unsatisfactory knowledge (less than 60%). These satisfactory and unsatisfactory answers were matched in the predesigned answer key.

### II-Operational Design

#### 1- Preparatory Phase

A thorough analysis of the previous and current literature related to all problems present in books, journals, articles, and magazines was carried out to be quantized with different research problems. The researchers gained and altered the tool used for data collection under the supervision of experts in the nursing field.

## 2- Exploratory Phase

### A-Pilot Study

A test was performed on 10% of nurses to note the tool's clarity, validity, and time needed to fill the tool. Then they were removed from the study sample. After the pilot study results, the necessary adjustments are made.

### B-Field Work

The original fieldwork started from 26 Jumada'II 1432 to 9 Rajab 1432 for data collection. The researchers were present for six days/week for different shifts and different study for two weeks. The objective of the study was described to nurses. The researchers completed the assessment sheet assessing nurses' knowledge and practices. The sheet had to be completed in about 15-20 minutes.

### III-Administrative Design

Official permission had to be attained for the study by the mentioned hospital head of the Nursing Department at Health Sciences College, Lieth, at Umm Al-Qura University. Acceptance of the voluntary subjects was also acquired for their participation in the study.

### IV-Statistical Analysis

All of the data was analyzed by applying number and percentage distribution, employing statistical analysis.

### Limitation Of The Study:

- The total number of nurses was one hundred and eighty in the start, and later some of the nurses rejected to join in the study, so the number of nurses was one hundred and fifty.
- Because of the more workload, many nurses did not complete the valuation paper with the researchers.

### Ethical Consideration

The approval for the collection of data was attained from Al-Lieth General hospital administrative personnel. Many meetings were apprehended between nurses and researchers. The aim was to aware the nurses about objectives and the outcomes of the research so that they will cooperate with the researchers. The explanation and demonstration of every subject were given. They were protected that all of the information and other materials are confidential and used for study and research purposes only. If anyone wants to withdraw from the research, she can leave, but oral consent will get before they leave the research.

## Results

1. Relations to sociodemographic of nurses are discussed. Table one explains the following things:

- The age of the 52.7% nurses was 25 to 30 years.
- The age of the 2% of the nurses was <20 years.
- According to demographics the 69.3% of them were female nurses.
- According to further research the 60% of the nurses had completed their diploma.
- 5.3% of the nurses had completed their technical nursing course.
- 36.7% nurses had experience of 1 to 5 years in their profession.
- 12% of the nurses had experience of more than ten years.

**Table 1: Distribution of Nurses According to Their Sociodemographic Characteristics (No = 150).**

Nurses' characteristics	No.	%
<b>I. Age in years</b>		
• < 20	3	2
• 20: < 24	52	34.7
• 25: < 30	79	52.7
• ≥ 30	16	10.6
<b>II. Gender</b>		
• Male nurse	46	30.7
• Female nurse	104	69.3
<b>III. Educational Level</b>		
• Diploma	90	60
• Diploma + Specialty	11	7.3
• Technical nursing institutes	8	5.4
• Bachelor	41	27.3
<b>IV. Years of experience</b>		
• < 1 year	45	30
• 1: < 5	55	36.7
• 5: < 10	32	21.3
• ≥ 10	18	12

2. There is the explanation of the nurse's workplace.

- 26.7% of the nurses were employed in the medical wards of the hospital.
- 14% of the nurses were working in the hemodialysis unit of the hospitals.
- 58% of the nurses were working as a trainer who gives training program as safety injections.

**Table 2: Nurses Distribution according to Their attendance and workplace and previous training database regarding Safety Injection (No = 150).**

Items	No.	%
<b>I. Work Place</b>		
	84	56
	66	44
<b>II. Department \ Unit in the Hospital</b>		
• Emergency Room	33	22
• ICU	26	17.3
• Surgical Ward	30	20
• Medical Ward	40	26.7
• Hemodialysis Ward	21	14
<b>III. Attendance Previous Training Program</b>		
• Yes	63	42
• No	87	58

3. Explained the following things.
- 66.7% of nurses were not wounded by needle sticks earlier.
  - The 33.3% of the nurses were previously wounded with needle sticks.
  - The 52% of the nurses were injured only one time in history.
  - 60% of the nurses were using soap and running water to was the site.
  - 6% of the nurses were using disinfectant dressing.

**Table 3: Nurses Distribution according to Their Assessment regarding NSIs and the Action Done (No= 150).**

Items	No.	%
<b>1) Did you injure by needle sticks?</b>		
• Yes	50	33.3
• No	100	66.7
<b>If yes, how many time of occurrences NSI?</b>		
• 1 time	26	52
• 2 to 3 times	10	20
• 4 to 5 times	10	20
• > 5 times	4	8
<b>2) What were the actions done?</b>		
• Squeeze the site of injury.	17	34
• Wash the site with soap and running water	30	60
• Cover the site with disinfectant dressing.	3	6

**Table 4: Nurses Distribution according to Knowledge about Definition, Causes, Investigations, Vaccination, Complications and Preventive Measures for NSI (No. =150) .**

Items of knowledge	No.	%
<b>I. Definition</b>		
• Known	150	100
• Unknown	0	0
<b>II. Causes of needle stick injury</b>	**	**
• Recapping needle	90	60
• Work stress	82	54.7
• Sudden patient movement during & after procedure	78	52
• Work loud	72	48
• Inadequate supplies of sharp container	30	20
• Social problems	15	10
• Lack of experience	12	8
• Neglecance	8	5.33
<b>III. Investigations required after needle stick injury</b>	**	**
• Hepatitis B, C	146	97
• AIDS	132	88
• CBC	33	22
<b>IV. Vaccination required</b>		
• Yes	86	57.3
• No	64	42.7
<b>V. Complications</b>	**	**
• Hepatitis	133	88.7
• AIDs	117	78.00
<b>VI. Preventive measures</b>		
• Reduce work loud	35	23.3
• Do not recap needle	82	54.7
• Provide adequate supplies of sharp container	33	22

\*\* Number is not exclusive.

4. Explained the causes and inquiries needed after NSI.
- All the nurses (100%) known the sense of the injury with needle injection.

- The common causes of NSI were stress due to work reported by 54.7% of the nurses, and recapping needle reported by 60% of the nurses, and sudden patient movements reported by 52% of the nurses. 97% of the nurses reported that the common investigation required after NSI is Hepatitis B and C tests.
- 57.3% which is more than half of nurses known the process of vaccination against NSI.
- 88.7% of the nurses reported that the common cause of NSI is the types of hepatitis.
- 54.7% of nurses reported that do not recap the needle was the common preventive measure against NSI.

5. Explained the following things:

- 88.7% of the nurses had great knowledge about prevention and management for NSI.

- 11.3% of the nurses had insufficient knowledge about prevention and management for NSI.

**Table 5: Distribution of Total Score Level of Nurses' Knowledge Regarding Prevention, Management and Follow up for NSIs (No =150)**

Total Nurses' Knowledge	No.	%
Satisfactory	133	88.7
Unsatisfactory	17	11.3

6. Explains that

- 97.3% of the nurses had knowledgeable practices about prevention and management for NSI.
- 2.7% of the nurses had unskilled practices about prevention and management for NSI.

**Table 6: Distribution of Total Score Level of Nurses' Practices as Regards Prevention, Management and Follow up for NSIs (No. =150).**

Total Nurses' Practices	No.	%
Competent	146	97.3
Incompetent	4	2.7

7. Explained that there is a difference between total score of nurse's knowledges and their practices about NSI. 88% of the nurses had knowledge and skilled practices while rest of the nurses had no knowledge and no skilled practices about NSI preventions and management.

**Table 7: Differences between Total Score Level of Nurses' Knowledge and Their Practices as regards NSIs (No=150).**

Practices Knowledge	Nurses' Practices				Total		T. test	P. value
	Competent		Incompetent		No.	%		
	No.	%	No.	%				
Satisfactory	132	88	1	0.7	133	88.7	0.842	< 0.01**
Unsatisfactory	14	9.3	3	2	17	11.3		
Total	146	97.3	4	2.7	150	100		

\*\*Significant (p < 0.01)

## Discussion

Needle stick injury serves as a significant cause of injuries and hazards for health care workers. Due to constant exposure to Blood Body Fluids (BFFs), workers are most likely to be exposed to viruses like Hepatitis B and C viruses and HIV.<sup>15</sup> Nurses exposed to germs and blood-borne pathogens are the most dangerous and lethal hazard for them, but it is also preventable. Prevention to almost 80% can be carried out of NSIs by using safe needle devices, combined with worker practice and education, to minimize injuries by 90%.<sup>16, 17</sup> The present study works to determine the nursing staff's knowledge, education, and training related to NSIs.

The studies related to the socio-demographic characters of nurses revealed that half of the nurses' present had the age range of 25-<30 years, these revelations were identical to other studies of<sup>18</sup> that studied knowledge, attitude, practice and training of nurses in the pediatric unit of Tanta university hospital. They showed that 68% of nurses age were between 20-30 years.

The studies relevant to nurses' education showed that almost half of nurses only had a diploma. At the same time, one-quarter of them possessed bachelor's degrees; these findings had a similarity between<sup>19</sup> the results revealing that the majority of nurse's graduate from diploma nursing school.

Relating to the pervasiveness of NSI, the reports show that almost one-third of nurses get injured due to this, and more than half have a one-time occurrence. These studies were similar to the findings of<sup>20</sup> that showed the awareness and knowledge between HCWs related to NSI, working in Tertiary care hospital, Ahmedabad, Gujarat, and studies showed that 36% of HCWs carry NSI and 67% had 1-2 pricks per year. As reported by,<sup>21</sup> it was revealed that US 8, 00, 000 of 5.6 million workers contain NSI every year.

Findings of nurses' knowledge and actions to be carried out post-exposure to NSI showed that nurses usually wash the site of injury with soap and water, later covering it with a disinfectant dressing. At the same time, the rest one-third squeezes the area of injury. On the other hand,<sup>11-13</sup> showed no scientific proof that using antiseptics and squeezing the wound will prevent transmission of blood borne pathogens, and the use of caustic agents like bleach was rejected and not recommended.

Studying nurses' knowledge on causes for NSI, almost half of the nurse stated that main causes must be recapping of needles, which was same as<sup>16</sup> whose studies revealed that needle sticks/sharps were studied and were confirmed to be the major cause of NSI due to continual recapping and drawing

of blood for laboratory test from the patient.

The recent studies showed that half of the nurses tend to recap their needles after use. However, this was negated with<sup>20</sup> described knowledge and awareness related to NSIs in Tertiary hospital and showed that studied HCWs recapped 22% needle, and precaution guidelines were known to 81%.

Regarding nurses' knowledge of different problems and preventive measures for NSI, it was shown that many nurses and more than three quarters said that AIDS and hepatitis were major complications here. Three-quarter nurses knew about the preventive measures and protocols relating to NSI. It was contradicted in<sup>20</sup> that knowledge relevant to NSI prevention was inadequate for many workers. This claim, supported by,<sup>21</sup> said that 70% of nurses and paramedical staff are knowledgeable about Hepatitis B transmission by NSI.

General Nurses' practice regarding NSI showed that many performed satisfactorily, which may be due to their training and years of experience in this nursing field. The present study result corresponded with,<sup>22</sup> showing many nurses worked on intravenous cannulation quite decently. However, this was opposed in,<sup>23</sup> featuring that nurse usually scoreless in this regard of cannula insertion.

Determining the difference between total scores of knowledge and practice shows that there were highly statistically significant differences ( $T= 0.8842$ ,  $P < 0.01$ ). These findings showed a need to improve nurses' knowledge and training regarding this matter and improve their performance. In this context,<sup>24</sup> concluded that knowledge is practicable when performed in a professional situation; knowledge is present in a practitioner and unable to be expressed in words.

## Conclusion

NSI and other wounds are the serious threats to healthcare workers by the transmission of deadly viruses and blood borne pathogens irrespective of the practices, policies, and products.

The NSI between nurses and the practices of recapping needles increases the probability of NSI. The current study reveals that nurses had knowledge and skilled practices while only some of the nurses had incompetent practices about NSI preventions and management. Correspondingly, there is a difference between statistics of nurse's knowledges and their practices about NSI. However, we recommend further research on large scale as increasing sample size will to maximize effects of statistics and lessen influences of other intertying factors.

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