

## Evaluations of Stress Level Caused by Fear of Exposure to Needle stick Injury among Nurses: A cross-sectional study

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**Abstract:** Needlestick injury is one of the significant stress-leading causes among nurses in healthcare settings. **Aim:** The aim of this study is to assess the level of stress caused by fear of needlestick injury exposure among nurses working at Sohag University Hospital. **Subject and methods:** A cross-sectional study conducted with on 178 nurses from different Sohag University Hospital departments using two tools, demographic and needlestick information tool and stress level tool. **Results:** About seventy percent of nurses from a variety of units in Sohag University Hospital suffered from severe stress of exposure to needlestick injuries and indicated that they have been actually exposed to prickle in the preceding two months. Majority of injuries occurred in the morning shift at ICU, surgical, medical and their belonging subspecialties departments by syringes needles, IV devices and medical scalpels. The respondents graduated from Secondary School of Nursing were the most common were highly exposed to needlestick injuries, and were planning to leave the clinical nursing procedures or their changed career categorically. A significant percent of nurses preferred not to report official authorities on needlestick injuries for these reasons, busy job, no possibility of infection from needlestick, and no way to communicate with officials. The most common procedures for needlestick injuries occur among nurses was during recapping of needles, preparing and giving drugs and most of them did not perform any serological tests after injuries occurred. In addition, the current study shows that the high percent of nurses washed the injured place by the running water and soap, they used the disinfectants material to clean the injury site and put a dressing on the wound, and the most common sites of injury were the hands and fingers, and it occurred once or twice. There was a statistical significant correlation among needlestick injuries and educational level, departments, leaving of specific clinical nursing procedures and level of stress while no statistically significant relation is found between the previous training and needlestick. **Conclusion & Recommendations:** Exposure to needlestick injuries may cause severe stress among the nursing staff. Appropriate training and awareness should be given regularly to the nurses to ameliorate skills to deal with needlestick injuries during their nursing curriculum and continue after graduation to help reduce stress among nurses.

**Keywords:** Fear, stress, needlestick injury, nursing procedures, training.

## **Introduction:**

A needlestick and sharps injury (NSSIs) is "a penetrating wound with an instrument that is that's doubtless contaminated with the body fluid of a different person".

Needlestick injuries represent a significant occupational risk in the healthcare system, with professional nurses bearing a large proportion of the overall burden, especially with equipment that have antecedently used on patients<sup>(1,2)</sup>.

Needlestick and different sharps related injuries are wounds caused by needles or sharp tool in health care services that unintentionally pierce the skin and causing exposure to infections from blood pathogens. Needlestick injury is a main occupational health and safety issue confronted by healthcare providers worldwide. Needlestick injuries (NSIs) are considered the most common route by which blood-borne pathogens like HIV and hepatitis HBV and HCV are transmitted from patients to health care providers. Such infections serve as main work-related risks and intimidation to healthcare providers, particularly wherever basic regulations of occupational safety and health are not applied. Nurses have the highest rate of needle stick injuries among all the healthcare providers<sup>(3)</sup>.

Nurses are more at the jeopardy than other healthcare workers. Beside biological hazards, the other factors like job difficulties, insufficient number of nurses relative to the patients, repeated shifts, and extravagant fatigue, increase this risk in our developing countries, notably Bijani et al.<sup>(4)</sup> ; IPEN<sup>(5)</sup> who indicated that errors and insecure ways of injection could cause life-threatening viral infections which are transmitted via the blood or body fluids. Nurses who serve in healthcare foundations with a loss of adequate supplies or poor organizational atmosphere and nurse leadership had a major hazard of needlestick injuries. Nurses in hospitals with satisfactory environments are less possible to experience NSIs. Nurses employed in hospitals with poorer staffing rates in addition to elevated levels of emotional stress and lassitude associated with their work had considerably higher likelihoods of needlestick injuries Ahmed<sup>(6)</sup>, additional more one-third of the healthcare workers be exposed to hepatitis B virus (HBV) and hepatitis C virus (HCV) and HIV due to NSIs<sup>(7)</sup>.

The Centers for Disease Control and Prevention reports that 385,000 needlestick injuries happen annually between hospital workers, most of those injuries are

experienced by nurses<sup>(8)</sup>. Each year, hundreds thousands of healthcare suppliers are exposed to hazardous and fatal blood borne pathogens through contaminated needlestick and perforating injuries because of accomplishing daily procedures in clinical activities<sup>(9)</sup>. These exposures will carry the chance of infection with viral hepatitis (HBV), (HCV), and Human Immunological disorder Virus (HIV). Coppola et al<sup>(10)</sup>. indicated that about three million healthcare providers annually receive an injury with occupational equipment, about two million exposures to HBV, one million to HCV, and one thousand to HIV worldwide. Despite an effective vaccine has been available since early 1980s, and although the worldwide implementation of universal immunization programs started in the early nineties, hepatitis B virus (HBV) still residues an eminent factor of morbidity and mortality. Injuries caused by penetrating objects, that involve biological risks are considered as the main important causes that lead to stress among the nursing employees. Following the instructions on how to deal with patients and safe care can help decrease stress<sup>(11)</sup>.

Stress is a dynamic interaction among the individual and surrounding atmosphere. In this interaction, demands, restrictions and

possibilities associated with a job is also perceived as threatening to outstrip the individual's capabilities and skills. Stress is any physical or psychological input that interrupts the adaptive state and provoked a coping reaction, it's become an essential part of life and is alleged to be the value we all pay for the struggle to keep alive<sup>(12)</sup>. Stress of exposure to needlestick injuries has other psychological consequences such as a depression, which is significant as other psychological traumas. Furthermore, the duration of disease is associated with to duration of getting the result of the second test and this issue has a deep effect on family relations and presence in the workplaces<sup>(13)</sup>. Chatzigianni et al<sup>(14)</sup> added that work-related stress is each physically and psychologically difficult and will cause high rates of absence, sickness, burnout, and turnover. Nursing is one of the foremost stressful and laborious occupations.

Several studies have been done all over the world regarding the stress post-traumatic among health care provider. However studies done on stress due to fear to needlestick injury exposure before it happen is rare. One of them is a study that was conducted in Brazil by Januario et al.<sup>(15)</sup> who evaluated the symptoms of post-traumatic stress disorder

after exposure to biological material and noted that, needlestick injuries poses one among the common activity health risk in a healthcare facilities. So, the psychological care for employees ought to be provided, through the health services, aiming to know, treat and reduce future psychological impact post-occupational exposure. Another study done in Salento, Italy by G.d'Ettore,<sup>(16)</sup> was to assess the job stress and needlestick injuries which targets for organizational interventions pointed that reduction in NSIs incidence and injuries following an interference to evoke proactive, integrated and comprehensive management of stress in the workplaces. Within the study wiped out in Egypt by Mohamed et al.<sup>(17)</sup> who studied the relationship between occupational stress and organizational commitment among nurses at Port-Said Hospital and pointed out that work-related stress had negative influence on nurses' morale and productivity. The study recommended that health education and training programs ought to be held regularly to control occupational stress and canopy the assessment of nurses' educational needs.

### **Significance of the study:**

Needlestick and sharp injuries remain a potentially life-threatening occurrence for health care providers globally and in the light of the sever absence of instruments and equipment within the departments at Sohag University Hospital especially in the wards where the nurses deal with blood and body fluids directly. Therefore, the researchers wanted to know the level of stress caused by fear of exposure to needlestick injuries among nurses.

**Research hypothesis:** the prevalence of stress among Sohag University Hospital nurses caused by fear of exposure to needlestick injuries is high.

### **Aim:**

The aim of this study is to assess the level of stress caused by fear of needlestick injury exposure among nurses working at Sohag University Hospital.

### **Materials & Methods:**

**Research design:** Cross-sectional study.

**Setting:** This study is carried out at Sohag University Hospital, at departments of pediatrics, ICU, CCU, obstetrics, oncology, dialysis, medical and belonging subspecialties and surgical and belonging subspecialties where the nurses are working.

**Subjects:**

The sample size was determined by using a formula for estimation of single population proportion with the assumption of 95% confidence level, the confidence interval 7% and population 1600 employed nurses with different education degrees. After calculating the total sample size was estimated to be 175.

**Data collection Tools:** Two tools were used to get the aim of this study:

- **Tool 1: Knowledge information sheet:**

This tool was developed by researchers and consists of two parts as follows:

**Part I:** Demographic data and work characteristics of the study subjects such as age, educational level, job, years of experience, working departments, vaccination, previous training, it included 7 items.

**Part II:** This part was consists of 14 items used to identify the history of needlestick, frequency, type, time, way of the stick, reason for not reporting about injury, investigation after stick, the procedures taken after exposure and the most common area of exposure, future plan for work, effect of stick on nurses' absenteeism and clinical nursing care.

**Scoring system:** the responses of this part of tool ranged between yes/No and Multiple Choose Questions (MCQs), as for

to yes/No every response was represented by (1) in yes and a (Zero) in no response while the MCQs questions, every response was represented by 1 degree, if the respondent chooses one answer, she takes one degree, and takes two degrees if chooses two answers, and so on.

- **Tool 2: Stress level measurement**

**tool:** this tool was developed by Moayed et al.<sup>(18)</sup>, for the purpose of assessing level of stress among nurses caused by exposure to needlestick injury in different situations or circumstances. It included 20 items divided into four domains:

- **First domain:** inquires about safety policy, such as the importance of instructions related to individual safety and work-related incidences, lack of communication for reporting to authorities, lack of protective equipment and training before and after injury occurred and it included five questions.

- **Second domain:** this section focuses on occupational safety, such as the lack of time treatment if injuries occurred, the lack of availability and effectiveness of the vaccines program and treatments, lack of proper and complete stick record and included six questions.

- **Third domain:** inquires about the situations which arisen to nurses while taking care of patients such as a closed contact with blood/body fluids of infected patients with hepatitis/HIV, uncertain diagnosis and exposure to needlestick during care and it included four questions.
- **Fourth domain:** investigates the all environmental influences upon the mental health of nurses in treatment wards such as chastised, providing the patient care in stressful situations, threated by patient, colleagues and companions to the puncture as well as lack of work quality after injury and it included five questions.

### **Scoring system:**

The items of this tool were rated under a five point Likert scale system (1= very low; 2= low; 3= average; 4= high; 5 = very high). The bare minimum total score that could be obtained was 20 and the greatest score was 100. The stress level was categorized as the following; severe stress (more than 50% of responses), moderate stress level (25%-50%) and mild stress from (25 or less).

### **Tools Validity:**

The validity test was done throughout five experts from the Faculty of Nurses at Sohag and Assuit Universities and

professional nursing from Sohag University Hospital for the two tools after translation the first tool into Arabic by the researchers and the required modifications were completed bases on jury recommendations.

### **Tools reliability:**

The reliability test of the study tools was conducted with 17 nurses, and after one week the retest was conducted on the same nurses, using the alpha scale as the following:

- First tool reliability with Cronbach's Alpha ( $\alpha=0.84$ ).
- Second tool reliability with Cronbach's Alpha:
  - Safety policy domain with Cronbach's Alpha ( $\alpha=0.82$ ).
  - Occupational safety domain with Cronbach's Alpha ( $\alpha=0.80$ ).
  - Contact-care domain with Cronbach's Alpha ( $\alpha=0.71$ )
  - Mental-environment condition domain Alpha ( $\alpha=0.64$ )
  - Total tool with Cronbach's Alpha ( $\alpha=0.78$ ).

### **A pilot study:**

A pilot study was applied on 18nurses (10%) were selected randomly, to test the clarity and applicability of the questionnaire and the time needed to fill it. Minor changes were done in tools so; the

pilot sample was excluded from the total sample.

### **Ethical Considerations:**

This study was permitted through the Ethical Committee of Sohag University Hospital institutional review board. The purpose and procedures of the study were explained to the Sohag University Hospital director for approval. Nurses have the full right to leave the study at any time they like. It was also explained that information would be collected anonymously. The respondents were informed about the aim and procedures of the study and then allowed to decide upon participation. Informed consent was gained from every one of those who approved to participate.

### **Field work:**

Data collection was carried out at the first week of November (2017) up to end of February (2018), from predetermined settings at the free time of nurses among patients care for two days/ week. The Arabic model of the questionnaire sheets were distributed to respondents to answer the questions after the researchers introduced themselves, and they told them in brief informed concerning the study aim and scope and their consents were obtained. The researchers were present most of the time during the collection of data for any required guidance and the

questionnaires were collected after filled. Respondents' confidentiality was ensured before beginning of data collection. The average time taken to complete each questionnaire was about 15-20 minutes.

### **Statistical analysis:**

The collected data were organized, tabulated, coded and statistical analysis was done by SPSS software package, Version 25.0. Number and percentage were used for quantitative data as well as mean and standard deviation. Also, to compare between groups was done using Pearson's Chi-square test ( $\chi^2$ ). The significance level was adopted at  $p < 0.05$  for interpretation of results of tests of meaningful.

### **Results:**

**Table 1;** shows demographic characteristics of studied nurses. It was found that the mean age of studied nurses about  $27.1 \pm 4.8$  years with mean experience year about  $7.8 \pm 5.1$ , the majority of them were female (89.9%) and more than half graduated from secondary nursing school (57.9%). Concerning working unit the present study revealed that about one fifth of them are working in ICU, surgical, medical and belonging subspecialties (20.8%, 18.5% & 17.4% respectively). Also, this study shows about 69.7% of nurses had received previous

training and just about half (47.6%) of them had received only one training course.

**Table 2;** illustrates the characteristics of the needlesticks injuries. It was found more than two third of nurses (65.2%) were sticked in the past two months and more than one third of them were sticked one or two times (22.5% &20.2% respectively) and the most common causes of sticked were by disposable syringe needles by (51.7%), most injured occurred at morning shift (58.4%), and the majority of needlestick injuries (81.5%) occur by nurses themselves. According to a serological test post sticking, the present study revealed that about 27.5% only from respondents were undergone to a serological test post sticking, and 59.0% were vaccinated against hepatitis. Also, about 75.3% of sticked nurses reported that the needlestick injury increases from the percent of absenteeism, and they planned to leave the nursing procedures and leave the career in the future by (73.0%, 60.7%) respectively.

**Table 3;** shows the level of stress among nurses' towards the safety policy adopted within their units, it was found, that more than two thirds of nurses' (64.0%) were very high stressful from the lack of special instruction related to individual safety and

work related accidents, and (61.2%) of them were very stressful from lack of or inadequate of protective equipment in their units. The results also show that about half of the nurses were very stressful from inadequate prevention trainings and inadequate training related to the care after the occurred injury by (49.5%; 51.1%) respectively. As for occupational safety within their units, it was found, more than two third (65.7%) of the nurses were very stressful from lack of timely treatment. As regards ineffectiveness of vaccines and the lack of effective vaccination program the results, show that more than half of them were very stressful by (57.3%, 53.4%) respectively. Also, the present study shows that about two thirds of nurses were very stressful from inadequate skills in injury prevention and ineffectiveness of treatments after the injury by(52.2%, 58.4%) respectively. As well the current study revealed that nearly 46.1% of nurses were very stressful from improper and uncompleted medical records.

**Table 4;** this table shows the level of stress towards the patient contact-care and mental-environment condition domains. It was found that about two third of nurses 67.4% were very stressful from work with patients affected with hepatitis and HIV, 51.7% of the contact with patients' body

fluids, 52.2% of the care of patients with uncertain diagnosis and 55.6% of the risk of needlestick during patient care. According to mental-environment condition, it was found about half of the nurses were very stressful from the mental-environment condition of the unit in which they work, due to criticisms, condition of the units, increase risk of injury and decrease in the quality of work after the injury and the threatened of needlestick by patient or colleagues by (58.5, 50.6%, 59.0%, 50% & 56.2% respectively).

**Table 5;** shows the comparison of the needlestick injuries according to academic level. It was found that the nurses they had graduated from secondary schools of nursing was having been more exposed to needle stick by 37.6% as compared with the other groups, with statistically significant differences.

**Table 6;** shows the comparison of needlestick injuries according to previous trainings. The present study revealed that although the large number of nurses about 67.5% had received training in this regard, no statistically significant differences were found between the trained and untrained groups in their exposure to needlestick injuries during last two months.

**Table 7;** shows the comparison of needlestick injuries according to leaving of

clinical nursing procedures specifically. The current study discovered that about eighty percent of nurses 81.3% who were exposed to needlestick injuries they preferred to go away from the clinical nursing procedures, with statistically significant differences.

**Table 8;** shows the comparison of needlestick plus sharps injuries according to the work departments. The current study revealed that the ICU, medical, surgical and belonging subspecialties departments were the foremost common places occurred to accidents of needlestick among nurses as compared with other departments by (56.8% ,78.8% & 87.1%), with statistically significant differences.

**Table 9;** shows the relation between needlestick injuries and stress level in all domains, it was found that about two third of nurses that exposure to injury (75 %) had severe stress level with the statistically significant differences were found.

**Table 1; Demographic characteristics of studied nurses.**

Characteristics	Sample No (178)	
<b>Age groups</b> Mean $\pm$ SD	27.13 $\pm$ 4.80	
<b>Years of experience</b> Mean $\pm$ SD	7.80 $\pm$ 5.11	
<b>Gender:</b>	No	%
Male	18	10.1%
Female	160	89.9%
<b>Level of education:</b>		
Secondary nursing	103	57.9%
Technical nursing	57	32.0%
Bachelor nursing	18	10.1%
<b>Working area/ unit:</b>		
ICU	37	20.8%
CCU	17	9.6%
Pediatric	21	11.8%
Obstetric/ gynecology	11	6.2%
Oncology	2	1.1%
Dialysis	26	14.6%
Surgical and belonging subspecialties	33	18.5%
Medical and belonging subspecialties	31	17.4%
<b>Previous training on needlestick injuries:</b>		
• Yes	124	69.7%
• No	54	30.3%
<b>Number of training (No. 124)</b>		
• One	59	47.6%
• Two	37	29.8%
• More than two	28	22.6%

Table 2; Characteristics of the needlesticks injuries

Stick information	Sample No (178)	
	No	%
<b>Have stick in past two months:</b>		
• Yes	116	65.2%
• No	62	34.8%
<b>IF yes number of sticking (No. 116)</b>		
• Once	40	22.5%
• Twice	36	20.2%
• 3 to 4	19	10.7%
• 5 or more	21	11.8%
<b>Causes of sticking (No. 126)</b>		
• Needles	92	51.7%
• Glass	8	4.5%
• I V devices	14	7.9%
• Medical scalpels	10	5.6%
• Surgery needles	2	1.1%
<b>Most time of sticking</b>		
• Morning shift	104	58.4%
• Afternoon shift	40	22.5%
• Night shift	34	19.1%
<b>Most body site exposure to sticking</b>		
• Arm	8	4.5%
• Hand and fingers	166	93.3%
• Leg	4	2.2%
<b>How was sticking</b>		
• My self	145	81.5%
• Colleagues	21	11.8%
• Doctors	10	5.6%
<b>Investigation post sticking</b>		
• Yes	49	27.5%
• No	129	72.5%
<b>If yes, post</b>		
• 4 day	8	16.3
• 7 day	6	12.2
• 30 day	16	32.7
• 366 day	19	38.8
<b>Hepatitis or AIDS vaccination</b>		
• Yes	105	59.0%
• No	73	41.0%
<b>Sticking increase your absenteeism</b>		
• Yes	134	75.3%
• No	44	24.7%
<b>Sticking causing move away from the clinical nursing practices</b>		
• Yes	130	73.0%
• No	38	27.0%
<b>Sticking lead to leave the career</b>		
• Yes	108	60.7%
• No	70	39.3%

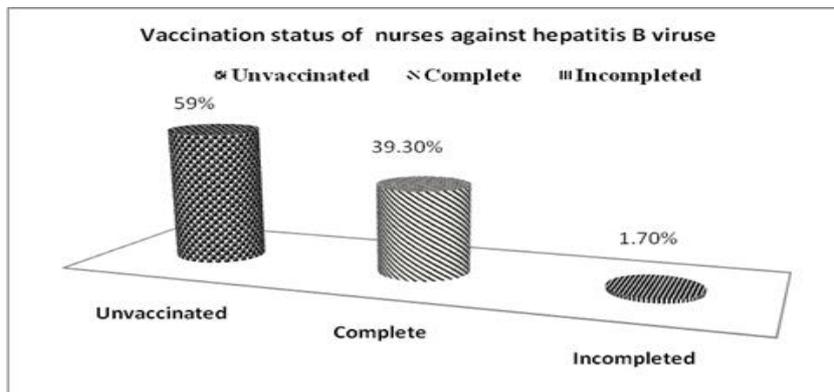


Figure 1; vaccination status of nurses against hepatitis B virus

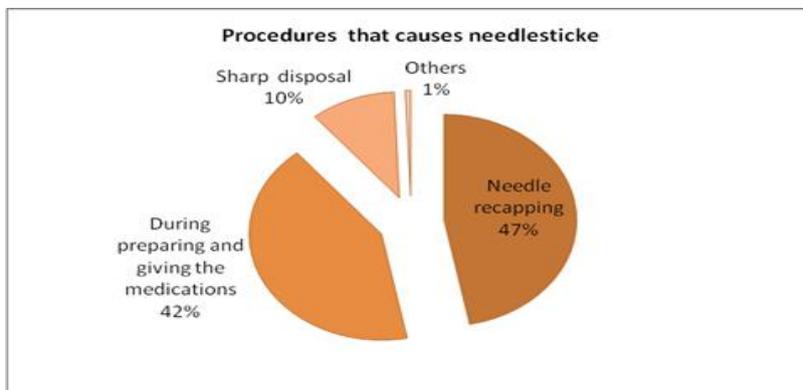


Figure 2; procedures that causes for needlestick

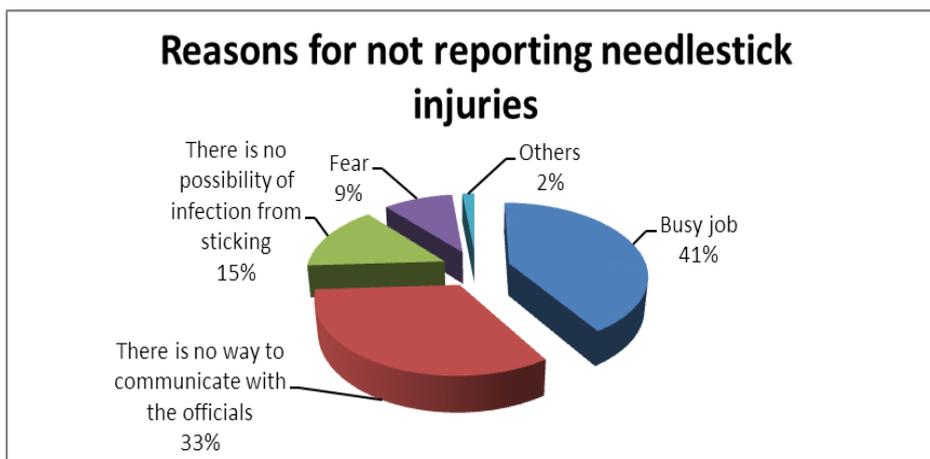


Figure 3; Reason for not-reporting needlestick injuries

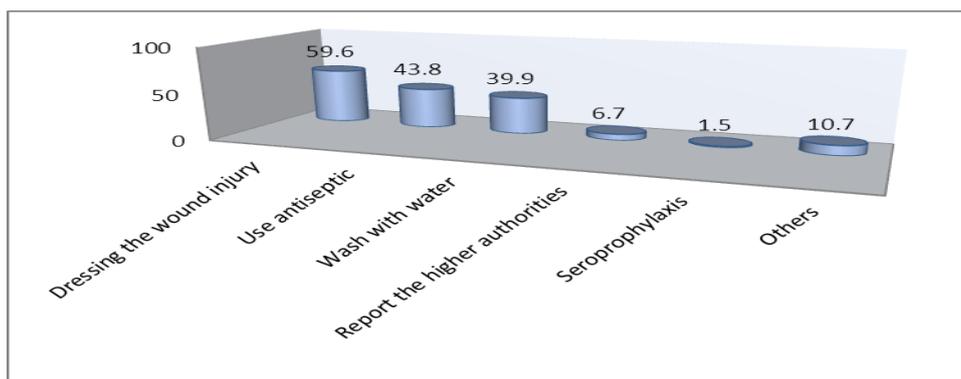


Figure 4; Measures taken after exposure to needlestick  
 \* More than an answer, so the total proportion was more than 100%.

**Table 3; Frequency distribution of safety policy and occupational safety domains**

Items	Very low N(%)	Low N(%)	Average N(%)	High N(%)	Very high N(%)
<b>Safety policy domain:</b>					
1-Lack of special instruction related to individual safety and work related incidences	10(5.6)	17(9.6)	11(6.2)	26(14.6)	114(64.0)
2-Lack of communication for reporting to authorities	5(2.8)	19(10.7)	20(11.2)	57(32.0)	77(43.3)
3-Lack of or inadequate protective equipment in the unit (masks, goggles, face shield, gloves)	10(5.6)	11(6.2)	12(6.7)	36(20.2)	109(61.2)
4-In adequate prevention trainings	14(7.9)	14(7.9)	19(10.7)	43(24.2)	88(49.5)
5-In adequate training related to the care after the occurred injury	13(7.3)	20(11.2)	18(10.1)	36(20.2)	91(51.1)
<b>Occupational safety domain:</b>					
1-Lack of timely treatment if injured with needle stick	9(5.1)	6(3.4)	15(8.4)	31(17.4)	117(65.7)
2-Possible ineffectiveness of vaccines	8(4.5)	5(2.8)	14(7.9)	49(27.5)	102(57.3)
3-Inadequate skills in injury prevention	7(3.9)	9(5.1)	17(9.6)	52(29.2)	93(52.2)
4-Lack of proper and complete medical records	9(5.1)	11(6.2)	26(14.6)	50(28.1)	82(46.1)
5- Lack of effective vaccination program	4(2.2)	11(6.2)	25(14.0)	43(24.2)	95(53.4)
6-Ineffectiveness of treatments after the injury	6(3.4)	11(6.2)	20(11.2)	37(20.8)	104(58.4)

**Table 4; Frequency distribution of contact-care and mental-environment condition domains**

Items	Very low N(%)	Low N(%)	Average N(%)	High N(%)	Very high N(%)
<b>Contact-care domains:</b>					
1- Work with patients affected with Hepatitis and HIV	3(1.7)	5(2.8)	13(7.3)	37(20.8)	120(67.4)
2-Contact with patients' body fluids (blood, vomit, etc.)	4(2.2)	6(3.4)	16(9.0)	60(33.7)	92(51.7)
3-Care of patients with uncertain diagnosis	3(1.7)	5(2.8)	19(10.7)	58(32.6)	93(52.2)
4- The risk of needle stick during care	4(2.2)	7(3.9)	17(9.6)	51(28.7)	99(55.6)
<b>Mental-environment condition:</b>					
1-The condition of the unit in which you work	4(2.2)	8(4.5)	27(15.2)	34(19.1)	104(58.5)
2- To be chastised	6(3.4)	9(5.1)	20(11.2)	53(29.8)	90(50.6)
3- Providing services to patients in different situations, which increases the risk of injury	4(2.2)	13(7.3)	17(9.6)	39(21.9)	105(59.0)
4- The threat of needle stick by patient, colleagues and companions	4(2.2)	12(6.7)	24(13.5)	49(27.5)	89(50.0)
5- Decrease in the quality of work after the injury	4(2.2)	10(5.6)	26(14.6)	38(21.3)	100(56.2)

**Table5; Comparison of needlestick injuries according to academic level**

Academic level		Stick past 2 month		Total	P value
		Yes	No		
Diploma	Count	67	36	103	<b>0.005</b>
	% of Total	37.6%	20.2%	57.9%	
Technical	Count	43	14	57	
	% of Total	24.2%	7.9%	32.0%	
Bacclurat	Count	6	12	18	
	% of Total	3.4%	6.7%	10.1%	
Total	Count	116	62	178	
	% of Total	65.2%	34.8%	100.0%	

**Table 6; Comparison of needlestick injuries among nurses according to training**

Stick past two month			Training		Total	P value
			Yes	No		
Stick past 2 month	Yes	Count	84	32	116	0.4
		% within Training	67.5%	59.3%	65.2%	
	No	Count	40	22	62	
		% within Training	32.5%	40.7%	34.8%	
Total	Count		124	54	178	
	% within Training		100.0%	100.0%	100.0%	

**Table7; Comparison of needlestick injuries according to leave the clinical nursing procedures**

Stick past two month			Leave procedures		Total	P value
			Yes	No		
Stick past 2 month	Yes	Count	39	77	116	0.006
		% within leave procedure	81.3%	59.2%	65.2%	
	No	Count	9	53	62	
		% within leave procedure	18.8%	40.8%	34.8%	
Total	Count		48	130	178	
	% within leave procedure		100.0%	100.0%	100.0%	

**Table 8; Comparison of needlestick and sharps injuries according to departments**

Stick past two month			Unit							Total	P. value	
			ICU	CCU	Medical	Pediatric	Obstetric	Oncology	Dialysis			Surgical
Stick Past 2 Months	Yes	Count	21	9	26	14	4	1	14	27	116	0.011
		% within unit	56.8%	52.9%	78.8%	66.7%	36.4%	50.0%	53.8%	87.1%	65.2%	
	No	Count	16	8	7	7	7	1	12	4	62	
		% within unit	43.2%	47.1%	21.2%	33.3%	63.6%	50.0%	46.2%	12.9%	34.8%	
Total	Count		37	17	33	21	11	2	26	31	178	
	% within unit		100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	

Table 9; Relation between the needlestick with stress level in all domains

Stress domains	Stick in past two months				P. value
	Yes No. =116		No No. =62		
	NO.	%	NO.	%	
<b>1-Safety policy domain</b>					<b>0.001**</b>
• Mild stress	13	11.2	17	27.4	
• Moderate stress	15	12.9	10	16.1	
• Sever stress	88	75.9	35	56.5	
<b>2-Occupational safety domain</b>					<b>0.002*</b>
• Mild stress	16	13.8	11	17.7	
• Moderate stress	13	11.2	27	43.6	
• Sever stress	87	75.0	24	38.7	
<b>3- Contact-care domain</b>					<b>0.01*</b>
• Mild stress	17	14.7	20	32.3	
• Moderate stress	25	21.5	19	30.6	
• Sever stress	74	63.8	23	37.1	
<b>4- Mental-environment condition domain</b>					<b>0.002*</b>
• Mild stress	13	11.2	16	25.8	
• Moderate stress	27	23.3	24	38.7	
• Sever stress	76	65.5	22	35.5	

### **Discussion:**

Nurses form a main constituent and the backbone of the healthcare system. During the achievement discharge of their responsibility, nurses experience various kinds of work-related injuries and stress, have harmful impacts on their health and nursing quality <sup>(19)</sup>. The present study has shown that the majority of studied nurses were females while the minority was from males with mean years of experience about eight years, and more than a half of them were graduates from secondary nursing school. These results were came in agreement with study done in Jordan by Higazee et al <sup>(20)</sup>. who found that the majority of the participants were females and most of them were between 20 and 30 years, quite than half of the participants were married, with working experience ranged from 1-5 years. And other than half of the participants had unvaccinated adjacent to hepatitis B virus.

According to the characteristics of the needlesticks injuries, the current study revealed that the highest percentage of studied nurses had taken a previous training about needlestick and its dangerous effect ranged from one to two times however, more than two thirds of nurses encountered the needlestick injury

in the past two months and the disposable syringes needles were the most common injury-causing devices of the stick and it occurred by them and occurred in the morning shift than other shifts. These results in harmony with a study conducted in north-western Tanzania by Chalya et al. <sup>(21)</sup> about the needlestick injuries and splash exposures among healthcare workers at a tertiary care hospital, and found that concerning two third of respondent who conducted invasive procedures and different nursing interventions within the last two months had suffered from the prick of the skin by syringe needles. And Jahangiri et al <sup>(22)</sup>. added that the majority of needlestick injuries occurred in departments with syringe needles being the foremost common responsible device and occurred during recapping of needles in the morning shift.

About the vaccination, the present study shows that about two-third of nurses had received vaccination against hepatitis B Virus(HBV), however, just about thirty percent of those exposed to needlestick injuries were undergone to a serological test. These results were in agree with study consequences completed by Hussain et al <sup>(23)</sup> who reported that the vaccination condition of the studied group wasn't very

satisfactory, as only slightly more than half were completely vaccinated whereas, approximately one fourth were moreover not vaccinated or just partially vaccinated. What more according to an investigation which nurses were done later than injury, the results of the current study was conflicting with Royal College of Nursing publication report <sup>(24)</sup> results which found that, three in ten only nurses did not have undergone to the serological tests following the needlesitck injury whereas the majority of nurses were undergone to the serological tests.

Concerning to the places of needlesticks injury incidences; the current study shows that the majority of nurses were exposed to needlesticks injury in the ICU, surgical, medical and their related sub-specialties departments as compare with other departments,with statistically significant differences were found between them. The present study findings were consistent with Zhang et al.<sup>(25)</sup> study results about needlestick and sharps injuries among nurses at a Teaching Hospital in China who found that the prevalence of needlestick were higher among nurses who working in the surgery and internal medicine department than other departments. Also, the hands and fingers were the most common sites within the

body parts that were exposed to needlestick injuries among respondents.

As for procedures that placed nurses at risk of needlestick injuries, the current study found that the most familiar procedures lead to needlestick among the nurses were during recapping needles and during preparing and giving the medications. These results, which are in accordance with the study conducted by Jahangiri et al.<sup>(22)</sup>, which found that recapping of used needles and setting up drugs were responsible for most the common activity responsible for sharps injuries.

According to the effects of needlestick injuries on nurses' and their future career plans, it was found the high percentage of nurses reported that the fear of needlesticks increase nurses absenteeism, leave the clinical nursing practices and that they arrange to leave the career categorically. Within the study done by O'Connor,<sup>(26)</sup> who confirmed that injury by sharp objects caused leave or absence and prolonged work interruption because of anxiety or stress disorder, with a rate of one out of twenty individuals, leading to a reduction of the quality of work.

Regarding the measures used by nurses immediately after they exposed to needlestick, this study highlighted that the

majority of respondents rumored that were washed the injury place with soap and running water, cleaning the wound with disinfectant materials and dressing the injured site. The results were consistent with study results by Jahangiri et al.<sup>(22)</sup> who report that the nurses washing the wound site by running water and soap as a the first action after injury followed by dressing the wound site.

In agreement with a study done by Nayak et al.<sup>(19)</sup>, who revealed that even with the stress from fear of exposure to infectious diseases during needlestick not all nurses prefer to report the exposed to needlestick injuries to the hospital officials, for numerous reasons of which busy job, do not know the mechanism for reporting injury with the officials, and there is no possibility of infection from sticking.

As regards to comparing the needlestick injuries according to educational level, it had been found that the nurses had graduates of Secondary Schools of Nursing were having been more their exposed to needle stick as compared other groups, with statistically significant differences. This result was accordance with a study conducted by Motaarefi et al.<sup>(27)</sup> who indicated that the highest incidence of needlestick injuries was seen in nurses and

that associated factors were level of education and history of related training.

As regards to comparing of needlestick injuries with to previous trainings. This study disclosed that despite the massive number of studied nurses received training about needlestick and sharps injuries, no significant differences were found between the trained and untrained nurses' groups as regard to their exposed to needlestick injuries during last two months. The current study findings are in contrast with Motaarefi et al.<sup>(27)</sup> who reported that the nurses who did not share in any training program regarding prevention and dealing with needlesstick injury in their workplace confronted a meaningfully higher risk of suffering from injuries as compared to with who participated in training.

According to the total level of stress among the studied nurses, the present study illustrates the majority of nurses were suffering from moderate-to-severe stress because of needlesstick they were exposure whereas, the minority about ten percent only were suffering from mild of stress. The present study results were accordance with Moayed et al.<sup>(28)</sup> study who reported that the level of stress among nurses are extremely multiplied by working with sharp objects. In agreement with study

done by Elsherbeny&Niazy<sup>(29)</sup>, who reported that there was a statistically significant relation between needlestick injuries and all stress domains. Sharma et al.<sup>(30)</sup> indicated that the stress reduces attention, motivation, concentration, higher cognitive processes and judgment skills. Occupational stress is additionally negatively associated with quality of care due to loss of sympathy for the patients and accumulated occurrences of mistakes and clinical errors. Akbari et al.<sup>(31)</sup> added that, it is necessary to take control and relaxing actions to reduce the level of work-associated stress and its harmful effects on the mental health of nurses with a needlestick injuries history.

### **Conclusion:**

The current study concludes that females, graduates of Secondary Schools of Nursing, working in ICU, surgical, medical and their belonging subspecialties departments in a morning shift were relatively very high level of perceived stress. The majority of injuries occurred during recapping of needles and preparing and giving the medications and that these nurses, intend to leave the clinical nursing procedures specifically or change their career categorically. A significant percent of nurses preferred not to report official authorities on needlestick injuries for these

reasons, busy job, no way to communicate with officials and no possibility of infection from needlestick, and did not perform any serological tests after the needlestick injury occurred. In addition, the present study shows that the high percent of nurses washed the injury place by running water and soap and used disinfectants material to clean the site and put dressing on the wound, and the most devices which caused needlestick injury was syringe needles, and the most frequently injured body parts were the hands and fingers and it occurred once or twice. Also, the present study revealed that a statistically significant correlation between each of the educational degrees, the departments and the leave of the nursing procedures and the level of stress, while there were no statistically significant correlation between the previous training and needlestick injury.

### **Recommendations:**

1. Sohag University Hospital should reduce such injuries by creating desirable work environments through providing adequate staff and resources.
2. Periodic training on proper and safe work procedures should be provided to healthcare provider so that injuries can be avoided, with hold periodical nursing

staff meetings to discuss and solve work related stress.

3. Reduce emotional exhaustion at work through providing safety-engineered devices and equipment.
4. This study indicated a requirement for more analysis on developing a reporting system for needlestick injuries in conjunction with periodic stress reduction modules for nursing professionals.
5. More study on a stress management program that aid nurses to manage with their work-related injuries.

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