INNOVATIONS

Occupational Risk Perceptions of Needle Stick Injuries among Nurses: Across sectional study

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Abstract

Background: Needle stick injuries (NSIs) are a common occupational hazard with potential physical health effects, including viral infections such as hepatitis and HIVplus the psychiatric consequences of NSIs as post-traumatic stress disorder (PTSD) and adjustment disorder (AD).**Aim :** To investigate occupational risk perceptions of needle stick injuries among nurse in selected hospital in Port-said city at Egypt. **Subject and methods:** A descriptive cross-sectional research design using a convenience sampling of 210 nurses using an adapted three parts tool that gathered sociodemographic data of nurses ; data about nurses's perceptions and attitude regarding needle stick injuries**Results:** there is a revealed that there are a highly significant relation were found between nurse's total scores of perceptions regarding needle stick hazards and their sociodemographic and job characteristics mainly in items related to age ,gender years experience in nursing career and department with p= (0.000,0.001) respectively. While a significant relation were found between nurse's total scores of attitude and their sociodemographic and job characteristics mainly in items related to level of education and Experience of contact to Infection with p= (0.177, 0.147) respectively . **Conclusion:** There is an acceptable occupational perception's level among nurses regarding NSIs with good attitude regarding needle handling which going to necessary needs for maintain implement educational programs that maintain and updated awareness of universal precautions especially regarding needle stick injuries **Relevance to Clinical Practice:** the study adhere to occupational risk exposures and hazards that affect quality of nursing outcomes and infection control measures policies of needle stick handling and closely contact .

Key Words: 1.Risk 2.Perception 3.Needle stick injuries 4.Nurse

Summary:

The current study contribute to the wider global clinical community which spotlight on the needs for prevent occupational hazards exposure and risks, training nurses regarding ideal handling of needle and infection control guidlines , needs for efforts to post an illustrated paradigm regarding correct and

proper handling for needle following procedures in order to refresh the techniques & Policies of needle stick injuries.

Introduction

Health care staff are ascribed to the group at highest risk of occupationally acquired bloodborne diseases consequential of contact with blood and body fluids ***(Martins et al.,2012***). Furthermore , all workers in health care settings usage needles or other sharp objects are at risk for needle sticking and sharps hazards which health care staff in under developed countries are at greater risk of blood borne pathogens because of the lack of safety measures and contact percausions ***(Kebede et al .,2012***).

Statistically, in Egypt the prevalence of needle stick and sharp injuries occurrence among nurses (72.8%) of nurses exposed to needle stick while (39.4%) exposed to sharp objects which the most common causative objects was hollow –bore stiff needle (78.03%) followed by blade (27.27%) then suture needle (23.48%) (***Ahmed .,2014***) . In Malaysia , the majority of needle stick injury occurred in operation theatre (37.4%) which among staff nurses is calculated (12.5%) (***Bhardwaj et al.,2014)*** . While, In Northeast Ethiopia , Approximately 3 million HCWs are exposed to blood borne viruses each year through contaminated needle sticks with contact of an infected patient's blood or through contact of the eye, nose or mouth with the patient's blood. (***Kebede & Gerensea ., 2018).*** Even as, high prevalence reported from Cuba (62.2%) and India (37.5%). While the prevalence was 62 cases per 1000 beds in Japan, and 69 per 1000 beds in Germany ***(Fathi et al.,2017).***

Additionally, (47%) of exposures were encountered in operation room and emergency units which injuries caused by hollow bore needles accounted for 66% of cases. Manipulating needles, recapping needles after sampling, inappropriate disposal of sharp objects , wrong handling of surgical equipments were the key risk factors associated with NSI (***El Awady.,2018***).

The occurrence of needle stick or sharp injuries of registered nurses was associated with organizational characteristics plus protective equipment and nurse characteristics. Hospitals can prevent or reduce such injuries by establishing good work environments and adequate facilities, reducing emotional exhaustion, and retaining more experienced nurses (***Cho et al ., 2013***).

Workforce exposed to solid waste exhibit significant increase in risk of illness resulting of poor personal hygiene and self-care, inadequate protective and safety resources for potentially occupational hazardous. Health effect of solid waste management included high prevalence of gastrointestinal, respiratory, skin and musculoskeletal morbidities (***Abd El-Wahab et al.,2014)*** .

Finally, it must be ensured that the nursing students are properly prepared to identify the severity of such incidences because all workers must be informed of the risk of infection related to blood and other biological fluids in the clinical settings. Staff must also be aware of the different preventive measures as standard precautions, use of personnel protective equipments, and the support of safe work environment. (***Nawafle et al ., 2017***)

Therefore, the present study was carried out aimed to investigate occupational risk perceptions of needle stick injuries among nurse in selected hospital in Port-said city at Egypt

Significance of study:

In Egypt , ***Gabr et al ., 2018*** stressed on that The risk of NSIs is still high among health care workers and at the risk of job-related blood-borne diseases which associated with various factors as the form of sharp objects and protective devices, the existence of supplies and policies for reporting accident ,

injuries and health care workers attitude through nursing practice as recapping and disposal-related issues. Furthermore, economically, worldwide exposure to contaminated sharps in 2015 is responsible for the average cost of a NSI calculated internationally US$747 (range IntUS$199–1,691). (***Cooke & Stephens .,2017***) .

Aim of the Study

To investigate occupational risk perceptions of needle stick injuries among nurse in selected hospital in Port-said city at Egypt

Research Questions:

1. What is the perception of needle stick injuries among nurse?
2. What is the attitude of nurses regarding precautions of needle stick injuries?
3. Is there a relationship between nurse's perceptions' of needle stick injuries with their sociodemographic characteristics?
4. Is there a relationship between nurse's attitudes towards needle stick injuries with their sociodemographic characteristics?

Conceptual Framework:

According to ***Fathi et al , 2017*** Health Belief Model (HBM) is one of the mainly commonly used psychological model that attempts to expect health behaviors through focusing on the personal attitudes and beliefs . In addition, Nast from ***Glanz et al,2008*** that the HBM, decision-makers mentally compute whether the benefits of behavior changes that balance the result of practical and psychological costs or obstacles. The model identifies four aspects of this assessment: perceived susceptibility to occupational risks, perceived severity, perceived benefits of behavior change, and perceived barriers to taking action **(Fig 1)** Health Belief Model framework

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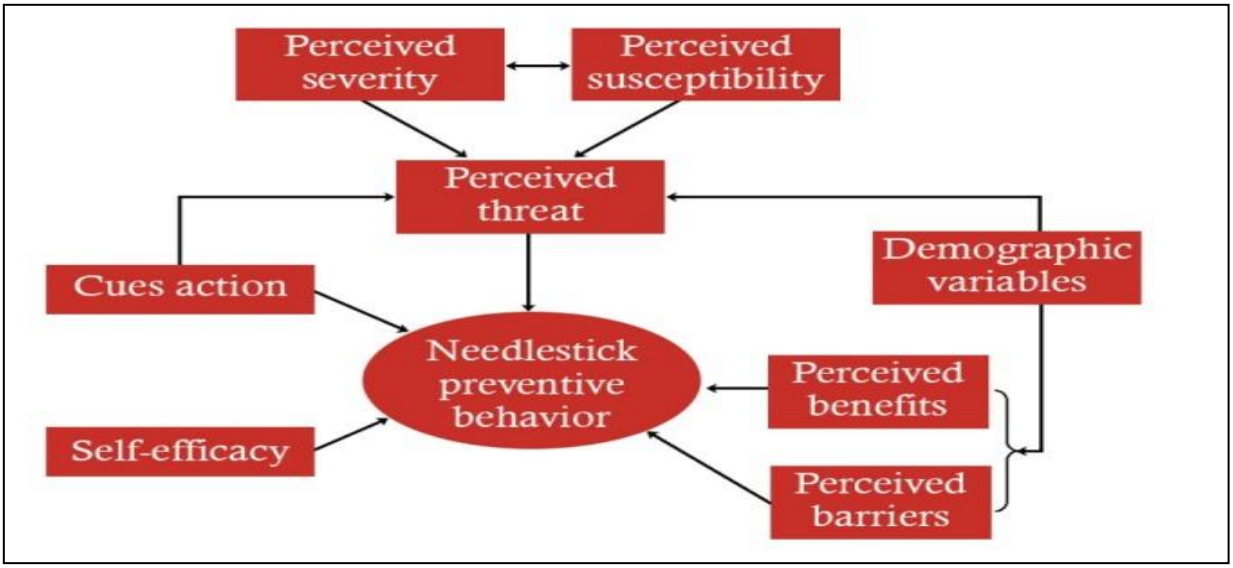

Methods

A descriptive cross-sectional research design was utilized. This study was carried out in Port-said, Egypt in inpatient Medical ; surgical & Emergency units at Port-said and Algawhara governmental Hospital . Convenience sampling as selected from all available nurses worked in the selected units in the period from May 2019 to August 2019. It included 210 nurses with inclusion criteria of nurses

worked for more than one year experience and willing to participate, newly and student nurses are excluded. Data were collected by using one tool contains 3 main parts based on literature review & adapted tool from ***Logan.,2002***. It contains 4 parts as follows: **Part I :** contains 19 items related to sociodemographic data of nurses and job characteristics as level of education , years of work experience , contact with infected patients ,...etc . **Part II : Nurse's Perception of needle stick hazards Questionnaire,** It includes 7 questions related to preferred foods and patient's habits in eating meals through the day , special diet , etc..... . **Part III : Nurse's attitude towards needle stick injuries sheet** : it contained 11 questions regarding the attitude and proper actions taken during practice as a preventive measures of needle stick injuries as action taking after procedures , proper action to cover needle , etc

Scoring system:

The scoring systems for part II including assessment of nurse's perception level towards needle stick hazards and part III assessment of attitude towards needle stick injury and corrective actions during daily nursing practice duties , for perception questions it is ranged from 0-1 scores which zero score for wrong answer and 1 for right answer. For attitude questions it is ranking from 1 to 4 degrees as usually, often, sometimes, and rarely respectively (***Logan.,2002***) .

Ethical considerations:

Ethical permission was obtained from the administrative authorities of hospital directors and head nurse to take permission to do this study in selected units and a brief oral explanation of the purpose and importance of the study was given to the nurse's and assured that the obtained information was confidential and used only the purpose of the study.

Procedure:

After collection of references and developing a tool based on recent literature review, the tool was validated after translation into Arabic language through face validity by five professors from medical and nursing specialists. **A Pilot study** was carried out after the development of the tools on 10% of the nurses to test applicability of the tools then necessary modifications were done, those nurses were then excluded from the sample of research work to assure the stability of answers. The tool reliability was tested by Cronbach alpha coefficient as follows: **Perceptions** (0.922) , **attitude** (0.91) . Data were collected through individually filled the questionnaire from May 2019 until August 2019 according to availability of nurse's schedule and break time to fill questionnaire over a period of four months and their appointment schedule (Thursday , Saturday) each week and availability of time for both nurses and the researcher. Data were revised, coded, entered, analyzed and tabulated using SPSS version 19. Both descriptive statistics (frequency, percentage,) and Chi-2 or Fisher Exact test was used. Statistical significance was considered at P-value <0.05 and highly significance at P-value <0.01.

Discussion

Today, Needle stick injury (NSI) is considered as one of the main causes of blood borne infections in healthcare system. Consequently, educational programs are essential to produce awareness and increase knowledge among nurses which reflect positive outcomes in changing perceptions toward safety measures (***Nawafleh et al .,2017***).

Needle stick and sharps injuries (NSIs) are critical occupational risk among health care workers (HCWs), which is extremely worrying due to the potential risk of transmitting blood borne pathogens (BBPs).So, there are a needs to pay more attention for reporting and improving occupational attitude as avoiding needle recapping in order to reduce the prevalence of NSIs and accordingly reduce potential risk of transmission of BBPs (***Gheshlagh etal.,2018***)

Regarding nurse's sociodemographic characteristics and job qualifications , the present study revealed that there slightly near two-third of nurses were female, nearly half are in aged from 26-43 years. Slightly more than half were single and had institute diploma level of education , above half worked in surgical units and had worked experience for more than 6 years in Nursing career while below half of them worked more than 6 years in this hospital . Half of nurses had worked for 8 hours daily with nearly half of them preferred morning and night shift. While two-third of them responsible for above 5 patients with one quarter of them have assistant in daily duties and half of nurses had contact with one isolated patient. These findings goes in the same line with ***Juni et al., 2015*** who highlighted on stressful psychosocial working conditions and negative stress perception among healthcare workers are important issue needed more attention because it considered as a main factors that increase risk of needle-stick injury include.

Regarding nurses experience of needle stick injuries, the present study revealed that one quarter of nurses experience only one times have suffered from suspected injection from normal patients , while more than two- third of them experience 5 times and more injection from patients with infectious blood diseases, and half of nurses have opinion that nurses susceptible to infection with infectious blood diseases should receive training Every 90 day. These findings goes in the same line with ***Balouchi et al., 2015*** stressed on that the main physical and human risk factors of needlestick injuries were syringe needles and crowded wards . otherwise ,The majority of the nurses perceived that training is the most effective method to prevent needle stick . This suggestions are supported with ***Bijani et al., 2018*** who necessitated on the importance of continuing education program and raising awareness among nursing staff in order to reduce occurrence of needle stick injuries .While , ***LO et al .,2016*** from Taiwan suggest that hospital managers follow regulations on work hours and optimize shift schedules for nurses to decrease occupation related injuries.

In Egypt , ***El Awady.,2018*** necessitate on that Needle stick injuries should be recorded in special forms and their causes should be clarified and regularly revised from infection control committeeand obtain perdiocally training of standard precautions with appropriate guidelines for staff awareness in ordered to reduce occurrence of needle stick injuries.

Furthermore, ***Anwar et al.,2019*** in KSA reported from their a comparative study between KSA and Egypt that Saudi nurses have good awareness and practice of injection safety. While Egyptian nurses have a higher prevalence of needle stick injuries (NSIs) ($P = 0.001$) because the effect of appropriate training courses among Saudi nurses and recommended maintain these training sessions in order to reduce the exposure to NSIs.

Concerning nurse's perception of needle stick hazards , the present study revealed that nearly haf of nurses perceived that The step of re-covering the syringe blade is done when there is no alternative choice with the majority of them perceived that the most common times a nurse will be under suspicion of syringe is when covering the syringe blade while, more than one quarter of them perceived that factors vulnerable health workers to infection with infected needles Weak immune system of workers and Sharpness of needle prick. Nearly half of them perceived that Apply global precautions is the best methods as a precautions to prevent the risks from the profession of needle suspicion. These findings goes in the same line with ***Fathi et al.,2017*** who found that the nurses achieved good levels of perceived benefits, susceptibility and severity with the perceived susceptibility (β -0.627) and stressed on that corrective action (β 0.695) is considered the leading predictors of the NSIs preventive attitude.

In Nigeria , ***Amira & Awobusuyi ., 2014*** reported that needle stick injuries are common among hemodialysis staff and is under-reported which the common cause was recapping of needles (45%), improper disposal of needles (30%), and venous cannulation and setting of drips (27.5%).

While , in Thailand ***Kasatpibal etal.,2016*** highlighted on high prevalence of NSIs among operating room nurses which needed appropriate guidelines, adequate staffing, proper training, and self-awareness in ordered to reduce these occurrences.

In Iran , ***Jahangiri et al., 2016*** explored that there are a high prevalence of NSIs among nurses. So, supportive measures are critical for the effective prevention of NSI incidents among the nurses as improving injection practices, adjustment of working schedule, designed training programs regarding using personal protective equipment, and providing an adequate number of safety facilities such as disposal containers and engineered safe devices. These recommendations goes in the same line with ***Cheung et al ., 2012*** in Hong Kong and ***Kebede et al .,2012*** in Ethiopia who necessitated on ongoing awareness on the risk of hazards through proper training, support use of kidney dish, immediate discarding of used needles, and adequate clinical supervision are necessary basics in reducing the risk of NSIs and SIs.

From another Point of views , In Jordan , Suliman et al .,2018 recommends more attention to NSI in the nursing curriculum, and providing more protection and post-exposure intervention for students during their clinical practice.

Regarding nurses attitude towards needle stick hazards during practice , the present study revealed that near two-third of nurses usually wear gloves when giving an intravenous injection or drawing a blood sample with the majority of them usually get rid of sharp tools in the place designated for them and usually cover the syringe blade with one hand. More than half of them usually wear protective gear according to the patient's condition and they do not wear gloves in difficult situations or heavy tasks. two-third of nurses usually have a place to collect used sharps available for everyone to use and of them usually Wearing protective equipment .More than half usually wash their hands after and before every skill and they usually know the patient's diagnosis before delivered care and contact with. These findings goes in the same line with ***Juni et al ., 2015*** in Malaysia who reported that 53.3% of nurse's students achieved good level of attitude and 55.3% of them attained good knowledge level regarding NSSIs. In addition, There is significant association between level of perception and year of study (P= 0.002) as well as between level of perception and their level of knowledge (P = 0.001) and attitude ($P < 0.001$).

In Egypt , ***Arafa et al., 2016*** discovered that fair knowledge and the practice levels among nurses regarding blood borne pathogeneses fair and recommended more attention from healthcare facilities to increasing nurses' awareness for strict adherence to IC standards, and implement training and preventive programs to minimize the risk of needle-stick injuries with maintain vaccinated all nurses against HBV.

In Iran , ***Jahangiri et al., 2016*** reported that the majority of NSIs occurred in the morning shift (57.8%) and the most common activity leading to inappropriate recapping needles (41.4%) , 60.2% for not reporting of the NSIs occurrence , heavy clinical schedule (46.7%) and low perception of infection risks (37.7%).

Concerning a relationship between nurse's perceptions of needle stick hazards and their sociodemographic and job characteristics, the present study revealed that there are a highly significant relation were found between nurse's total scores of perceptions regarding needle stick hazards and their sociodemographic and job characteristics mainly in items related to age, gender years experience in nursing career and department . These findings goes in the same line with ***Amini et al., 2015*** who found that there was a statistically significant relationship between sex and the rate of NSIs with a high rate of occupational injuries.

Concerning a relationship between nurse's attitude of needle stick precaution and their sociodemographic and job characteristics, the present study revealed that there are a significant relation was found between nurse's total scores of attitude and their sociodemographic and job characteristics mainly in items related to level of education and experience of contact to infection. These findings goes in the same line with ***Kebede & Gerensea ., 2018*** In Northeast Ethiopia who necessitated on that nurses are exposed to dangerous and deadly blood borne pathogens through contaminated needle stick injuries related to various risk factors as duration of working hours, experience, use of personal protective equipment and training.

In Nigeria ***, Amira & Awobusuyi ., 2014*** found that there are a highly statisically significance (p=0.016) among nurses with work experience between 6 and 10 years than others . Also ,Hollow bore needles were responsible for 82.9% of the NSIs . While , In Iran , ***Jahangiri et al., 2016*** found a statistically significant relationship between the occurrence of NSIs and sex, hours worked/week, and frequency of shifts/month among nurses.

From the forgoing discussion, nurse's education and awareness with needle stick injuries hazards is considered an essential issue in preventing occupational heath burden. in this regard , ***Hassan et al ., 2016*** necessitated on recommended periodic education for staff on the prevention of blood borne pathogens and other body fluids transmission in the hospital setting with encouragement of convenience vaccines in the healthcare facilities . On the other hands, ***Mannocci et al.,2016*** suggested highly economic efforts should be directed to occupational exposures prevention and infection transmissions as provision of safety-engineered devices.

Conclusion:

There is an acceptable occupational perception's level among nurses regarding NSIs with good attitude regarding needle handling which going to necessary needs for maintain implement educational programs that maintain and updated awareness of universal precautions especially regarding needle stick injuries

Relevance to Clinical Practice: the study adhere to occupational risk exposures and hazards that affect quality of nursing outcomes and infection control measures policies of needle stick handling and closely contact .

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Results:

Table (1): shows that there are (73.8%) of sample were female, about (43%) are aged from 26-43 years. Slightly more than half (54.8%) single and (59 %) had Institute diploma level of education. Finally, above half (47.1%) worked in surgical units. (54.8%) worked experience for more than 6 years in Nursing career while (40%) of them have worked more than 6 years in this hospital.

Table (2) : Shows that (50%) had worked for 8 hours daily with (48.6%, 49%) preferred morning and night shift respectively. while (74.8%) responsible for above 5 patients with (30%) of them have assistant in daily duties . Furthermore (49.5%) had contact with one isolated patient.

Table (3): revealed that (25.7%) of nurses experience only one times have suffered from suspected injection from normal patients , while (77.1) of them experience 5 times and more injection from patients with infectious blood diseases, (51.9%) had opinion that nurses susceptible to infection with infectious blood diseases should receive training Every 90 day.

Table (4): revealed that (42.4%) of nurses perceived that The step of re-covering the syringe blade is done when there is no alternative choice with (85.7%) of them perceived that the most common times a nurse will be under suspicion of syringe is when covering the syringe blade while, (33.8%) of them perceived that factors vulnerable health workers to infection with infected needles Weak immune system of workers and Sharpness of needle prick. Finally, (41.9%) of them perceived that Apply global precautions is the best methods as a precautions to prevent the risks from the profession of needle suspicion.

Table (5): revealed that (74.3%) of nurses usually wear gloves when giving an intravenous injection or drawing a blood sample with (84.8%) of them usually get rid of sharp tools in the place designated for them while, (84.1%) of them usually cover the syringe blade with one hand. (61.9%) of them usually wear protective gear according to the patient's condition while, (59%) of nurses rarely do not wear gloves in difficult situations or heavy tasks .(67.6%) usually have a place to collect used sharps available for everyone to use .(73.3%) of them usually Wearing protective equipment .(64.3%) usually wash their hands after and before every skill .Finally,(68.6%) of nurses usually know the patient's diagnosis before delivered care and contact with.

Table (6): revealed that there are a highly significant relation were found between nurse's total scores of perceptions regarding needle stick hazards and their sociodemographic and job characteristics mainly in items related to age ,gender years experience in nursing carrer and department with p= (0.000,0.001) respectively. While a significant relation were found between nurse's total scores of attitude and their sociodemographic and job characteristics mainly in items related to level of education and Experience of contact to Infection with p= (0.177, 0.147) respectively .

items	No.	%
Age		
below 25	61	29.0
26-34	91	43.3
35-44	40	19.0
45-54	15	7.1
above 55	3	1.4
Gender		
Male	55	26.2
Female	155	73.8
Education level		
diploma	73	34.8
Institute diploma	124	59.0
baccalaureate	9	4.3
Postgraduate	4	1.9
Departments		
Medical	56	26.7
Surgical	99	47.1
Emergency	55	26.2
Marital Status		
Married	92	43.8
Single	115	54.8
Divorced	3	1.4
year of work in Nursing		
1 year	23	11.0
1-3	64	30.5
4-6	31	14.8
More than 6 years	115	54.8
year of work in this hospital		
1 year	46	21.9
1-3	52	24.8
4-6	28	13.3
More than 6 years	84	40.0

Table (1): Distribution of nurses according to their demographic data (N=210)

Items	No.	%
The step of re-covering the syringe blade is done when		
There is no alternative choice	89	42.4
There is no possibility of transmitting an infectious disease	29	13.8
For secured medicine and there is no exit or pump from the syringe	69	32.9
I do not know	23	11.0
The most common times a nurse will be under suspicion of syringe is		
When covering the syringe blade	180	85.7
During the transfer of sharp tools to the waste box after use	16	7.6
While carrying and transporting tools after throwing them in the waste box	7	3.3
I do not know	7	3.3
Factors that make health workers more vulnerable to infection with infected needles		
Weak immune system of workers	71	33.8
Sharpness of needle prick	71	33.8
Use of antibiotics	11	5.2
Types of Microorganism	41	19.5
I do not know	16	7.6
Precautions to prevent the risks from the profession of needle suspicion		
Apply global precautions	88	41.9
Use of machine needles	8	3.8
Following precautions to prevent risks of the global profession	70	33.3
Wearing protective tools such as gloves	39	18.6
I do not know	5	2.4

Table (2): Distribution of nurses according to their work data (N=210)

Items	No.	%
Number of hours worked daily		
4 hours	1	.5
8 hours	105	50.0
16 hours	101	48.1
24 hours	3	1.4
Shift preferred to work		
Morning	102	48.6
Night	103	49.0
No time i preferred	5	2.4
Number of patient responsible for		
2	3	1.4
2-4	50	23.8
above 5	157	74.8
Number of assistant nurse		
1	36	17.1
2	56	26.7
3	63	30.0
4 and more	55	26.2
Number of isolated patient		
one	104	49.5
2	27	12.9
2-4	11	5.2
above 5	5	2.4
5.00	63	30.0

Table (3):Distribution of nurse's experience for occupational hazards resulting from needle stick injuries (N=210)

Table (4): Distribution of nurse's perception of needle-stick hazards during nursing practice

	No.	%
How many times have suffered from suspected injection from normal patients?		
1	54	25.7
2	42	20.0
2-4	17	8.1
5 and more	14	6.7
How many times have suspected injection from patients with infectious blood diseases		
1	28	13.3
2	8	3.8
2-4	5	2.4
5 and more	7	3.3
5.00	162	77.1
Nurses susceptible to infection with infectious blood diseases should receive training		
Every 90 day	109	51.9
yearly	41	19.5
monthly	34	16.2
I don't know	26	12.4

	Usually		Often		Sometimes		Rarely	
	No.	%	No.	%	No.	%	No.	%
I wear gloves when giving an intravenous injection or drawing a blood sample	156	74.3	30	14.3	22	10.5	2	1.0
I get rid of sharp tools in the place designated for them	178	84.8	27	12.9	4	1.9	1	0.5
I cover the syringe blade with one hand	101	48.1	39	18.6	35	16.7	35	16.7
I wear protective gear according to the patient's condition	130	61.9	40	19.0	31	14.8	9	4.3
I wear gloves when giving any treatment	105	50.0	36	17.1	51	24.3	18	8.6
I do not wear gloves in difficult situations or heavy tasks	27	12.9	19	9.0	40	19.0	124	59.0
I wear goggles when working with an infectious patient	28	13.3	15	7.1	21	10.0	146	69.5
There is a place to collect used sharps available for everyone to use	142	67.6	30	14.3	16	7.6	22	11.0
Wearing protective equipment is mandatory	154	73.3	31	14.8	14	6.7	11	5.2
I wash my hands after and before every skill	135	64.3	47	22.4	23	11.0	5	2.4
I know the patient's diagnosis before delivered care	144	68.6	22	10.5	31	14.8	13	6.2

Table (5): Distribution of Nurse's attitude towards needle stick precautions

Table (6): Correlation between total score of nurse's perception and attitude towards needle stick precautions during practice with their sociodemographic & job characteristics

Sociodemographic & job characteristics	Total scores of risk perceptions		Total scores of Attitude	
	r	P value	r	P value
Age	0.264**	0.000	-0.069	0.320
Gender	-0.194**	0.005	0.094	0.177
Marital status	-0.118	0.089	0.101	0.146
Level of Education	0.039	0.576	0.177*	0.010
Year of work in nursing career	0.235**	0.001	-0.083	0.232
Year of work in this department	0.245**	0.000	-0.110	0.111
Number of hours worked daily	-0.038	0.585	0.058	0.401
Shift preferred to work	-0.030	0.668	0.062	0.370
Number of assistant nurse	-0.019	0.779	-0.048	0.487
Number of patient responsible for	0.057	0.411	-0.047	0.496
Number of isolated patient	-0.103	0.137	0.103	0.136
Attending Training sessions	-0.079	0.257	0.053	0.445
Adequacy of protective equipments	-0.084	0.225	0.103	0.137
Experience of needle stick injury	-0.066	0.341	0.014	0.840
Experience of contact to Infection	-0.001	0.992	-0.147*	0.033

r: Pearson Correlation Coefficient *** highly significant at P≤0.01**

*** Statistically significant at p ≤ 0.05**