Needlestick and Sharps Injuries among Healthcare Workers in Military Hospitals

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Abstract: The World Health Organization (WHO) estimated that three million of the 35 million health care workers worldwide experience needle stick and sharps injuries every year. This study utilized a descriptive, correlation design. A survey method was employed to collect the data. The study was conducted in selected four (4) military hospitals in Luzon composed of physicians, nurses, medical technologists and ancillary staff. The knowledge on universal precautions and other concepts related to transmission of blood borne pathogens via needle stick injuries were high. There is also a high awareness on universal precautions and needle and sharp safety precautions. The most common activity when the injury was incurred was before the use of an item, followed by recapping of needles and the least response was during disposal of needles and sharps. The occurrence of needlestick injuries and health care workers group (χ^2= 19.98, p<0.05), knowledge on universal precautions and work practices (p=-0.15, p=<0.05) are significantly related**.** **N**eedle stick and sharp injuries and age (p=-0.16, p<0.05), are significantly related. However, area of assignment (χ^2=12.15, p= >0.05), years of practicing the profession (ρ=-0.08, p= >0.05), hours of work per shift (ρ=-0.01, p= >0.05), and shift schedule (ρ=0.06, p= >0.05) were not. Furthermore, there is no significant difference between the groups with needle stick and sharp injuries and the group without on the following variables: age (t=1.72, p= >0.05), area of assignment (t=-0.62, p= >0.05), years practicing the profession (t=1.05, p= >0.05), hours of work per shift (t=0.36, p= >0.05), and shift schedule (t=-0.92, p= >0.05). The study revealed that the health care workers are aware about the risks associated with needle stick and sharp injuries. Most of the respondents were aware of the basic guidelines of universal precautions; however, compliance to guidelines is not strictly implemented.

Keywords: occurrence; needle stick; sharps injuries; military

1. INTRODUCTION

1.1 Background

Health care workers (HCWs) are at risk of contracting blood-borne infections in their daily work through job-related factors like accidental needle stick and sharps injuries and mucocutaneous exposure to blood and body fluids. The World Health Organization (WHO) estimated that three million of the 35 million health care workers worldwide experience needle stick and sharps injuries every year. This means that healthcare workers are at high risk to acquire blood borne pathogens from used needles and sharps (WHO, 2004). With this, healthcare workers will be exposed to serious blood borne pathogens brought by the hepatitis B virus (HBV), hepatitis C virus (HCV), and human immunodeficiency virus (HIV).

Hanafi, Mohamed, Kassem and Shawki, (2011) asserted that nurses had the highest risk of needle stick and sharps injury compared with to physicians. Ancillary staff who are also involved in handling blood contaminated items are also at risk for needle stick and sharps injuries (Amira & Awobusuyi, 2014).

WHO and other countries show an average of four (4) needles stick and sharps injuries per year in the African, Eastern Mediterranean and Asian populations. A very low statistics compared with developed countries such as the United States and Europe. The Center for Disease Prevention and Control (CDC) recorded 385,000 needles and sharp-related injuries per year in the United States (Zafar et al., 2009). The high prevalence of needlestick and sharps injuries can be due to improved reporting system in developed countries. In the Philippines, it was reported by Tayaben (2015) that there were about of 4,004 healthcare providers who acquired needle stick injuries in 2004. On the other hand, Turao (2012) on the prevalence of needlestick injuries in one military hospital from 2011-2012, she was able to record 92 cases of needle stick injuries for two (2) years or a prevalence rate of 3.5%. There is established precautions and protocols on needle stick and sharp injuries but is no known account in the Philippines that these protocols are not followed.

A personal account of the researcher on needle stick injury can serve as a lesson and reference. The needle stick injury incident occurred two decades ago when she was a novice nurse assigned to an Emergency Room. She was accidentally punctured by a used intravenous needle by a physician. Unfortunately, the said intravenous needle was used to a patient infected with hepatitis B. The incident has caused the researcher considerable anxieties and fear of contracting the disease. This personal experience has motivated the researcher to conduct this study as part of the safety and risk management measures for the HCWs in the military hospitals where needle stick injuries and care of patients infected with blood borne diseases are no longer inevitable but a "part of the job. There is no account to prove that protocol on infection control is not being followed. However, the finding will serve as the basis for risk management and infection control program.

The findings of this study will provide a basis to strengthen infection control, safety, and risk management programs or protocols in the military treatment facilities nationwide. It will also contribute to the policy development and quality improvement initiatives for needle stick and sharps safety.

1.2 Statement of the Problem

This study aims to determine the prevalence and associated factors of needle stick and sharps injuries among health care workers in four military hospitals in Metro Manila and Cavite areas.

Specifically, the study sought to answer the following questions:

1. What is the level of knowledge on universal precautions and work practices among health care workers in selected military hospitals?
2. Is there a significant relationship between acquiring needlestick and sharps injuries, and
   2.1 healthcare professional group
   2.2 area of assignment
   2.3 length of service
   2.4 schedule of shift
3. Is there a significant difference in the knowledge of universal precautions and work practices among health care workers in selected military hospitals?

1.3 Scope and Limitations of the Study

This study will be limited to the four health care workers group-physicians, nurses, medical technologists and ancillary staff in the selected military hospitals in Metro Manila and Cavite. It will not attempt to implement a program on needle stick and sharps safety nor assess their respective infection control program as a whole rather it will serve as a basis to strengthen existing infection control, and prevention programs of the four selected military hospitals.

1.4 Review of Related Literature

1.4.1 Needle stick and sharps injuries defined

Sharma et al. (2009) defined needle stick injury as "any cut or prick to the respondents by a needle previously used on a patient and is work-related and sustained within the hospital premises." Sharps, on the other hand, are needles, blades, (such as a scalpel) and other medical instruments that are necessary for carrying out healthcare work and could cause injury by cutting or pricking the skin. Needle stick and sharps injury as a global issue bring about occupational risks. Primary issues related to needle stick and sharps injuries involve scratches, punctures or lacerations of the skin with fingers affected most often (Bohnker& Bowman, 2005).

1.4.2 Factors Associated with Needlestick and Sharps Injuries

There were several factors that were identified to be associated with needle stick and sharp injuries. Among these are healthcare professional group, the area of assignment, length of service and schedule of the shift.

1.4.3 Health Care Workers' Group

Nurses have the highest risk for sharps-related injuries in the workplace of any health professional group (Adib-Hajbaghery & Lotfi, 2013; Kumar, Khuwaja, & Khuwaja, 2012; Mbaisi et al., 2013; Butsashvili et al, 2012; Sharma, Gupta & Arora, 2010; The nurses working at the bedside sustain an overwhelming majority of exposures to blood and body

fluids. Almost 90% of all needle stick injuries occurred among nurses of third world countries where there is lack of knowledge, resources, and training (Zafar, 2009).

However, Nagao, et al. (2009) found out that there were more physicians that were injured than scrub nurses in an operating theater. Adams et al. (2010) supported the reports that adherence to needle stick safety protocols amongst surgeons is poor. Moreover, among the physicians in Nagao, et al.'s study, suturing was the most common activity being undertaken when the injury occurred. Smith et al (2006) had the same findings that physicians get more suture related injuries by 25% than any other activities. There is limited literature about laboratory employees in the needle stick and sharps injuries reported data.

1.4.4 Area of Assignment

Waqar et al. (2011) found out that 83% of health care workers experienced needle stick and sharps injuries in their professional life. The emergency department workers by nature of their tasks were most frequently affected followed by those working in the wards then at the operating room. In a study conducted by American Nurses Association from 706 ER nurses, 59% perceived an elevated risk for needle stick and sharps injuries when they felt pressured to get their work done quickly.

1.4.5 Length of Service

Martins et al. (2012) found that age and years of experience as factors associated with needle stick and sharps injuries among health care workers in a Portuguese hospital. It was further confirmed in a multivariate logistic regression showing that having more than ten years or more of work in health sciences increases the risk of needle sticks and sharps injury. However, Clarke et al. (2007) in Pennsylvania among 11,516 nurses with less than five years of experience were more likely to have sustained a needle stick injury ($p=0.03$, OR=1.23, 95% CI: 1.02-1.49). It was concluded that new nurses were 1.0 to 2.6 times more likely to sustain a needle stick injury than an experienced nurse.

1.4.6 Shift Schedule

Trinkoff et al. (2009) in a longitudinal study in three waves among nurses found out that working 12 hours of more per shift, more weekends and rotating shifts were significantly linked to higher rates of needle stick and sharps injuries.

1.4.7 Knowledge of Universal Precautions

Understanding universal precautions of healthcare workers refer to their conscious knowledge and competence with the needle stick and sharps safety programs of the hospital. Thus, compliance with universal precautions is one of the mandatory requirements for occupational safety and health.

1.4.8 Work Practices

Work practice was defined to be an adaptation of guidelines to real workplace. The three types of controls recommended by several studies include engineering controls administrative controls and the use of personal protective equipment. The purpose of which is to decrease occupational exposure.

1.4.9 Use of Safety-Engineered Devices

A safety-engineered device is a sharp device or sharp-related device designed to remove, isolate, or reduce the risk of exposure to blood borne pathogens. These devices are but are not limited to, needles with built-in protection (self-sheathing needles, scalpels, self-blunting), sharps disposal containers, and needleless systems.

1.4.10 Administrative Control Strategy

These are activities that involve the administration such as the policies governing needle stick and sharps injuries; monitoring and reporting of incidences; post-exposure evaluation and treatment; and education and training of personnel on the prevention of needle stick and sharps Many international studies advocate the use of applying universal precautions as safety measure in needle stick and sharps injuries.

1.4.11 Needle Stick and Sharps Injury Event Reporting

It is an international requirement for nurses to report needle stick and sharps injuries when they occur (Kable, Guest & McLeod, 2011). Underreporting of needle stick injuries appears to be common in the hospital environment, with the result of surveys that accounts more or less 80% of nurses that do not officially report their needle stick injuries incidents (Smith et al, 2006).

1.4.12 Cost of Needle Stick and Sharps Injuries

Financial/Economic Cost

Needle stick and sharps injury pose a significant economic burden. International studies reveal that it is expensive for both the injured health care worker and healthcare industry especially on work loss, litigation, physical damage and mental distress with pay-out based on their inability to work because of needle phobia (Green & Griffiths, 2013). Immediate and follow-up treatment for exposed employees was reported to cost from $71 to $5,000 per case in the United States (Centers for Disease Control and Prevention, 2008), an indicative of an enormous financial threat.

Psychological Impact

Adams (2012) discussed the psychological effect of a needle stick injury which includes emotional responses following an injury, including depression, crying spells, tension in the family, relationship issues, panic attacks, excessive anxiety and inability to work. Depressive symptoms have

been associated with needle stick, and sharps injuries in medical students in Japan and the authors recommended health screening for students suffering (Wada et al. 2007). In Korea, 71% of health care workers had experienced needle stick and sharps injuries and had significantly high scores for depression and anxiety (Sohn et al., 2006).

1.5 Synthesis

Safety has risen its way up to the priority list of health care systems. Still, everyday health care workers are exposed to occupational risks, specifically to blood borne pathogens. Statistics show how health care workers are greatly affected by this occupational hazard. Filipino health care workers are even more at risk. Literature reviews describe significant progress in health policy, practices, and safety-engineered product; however, health care workers continue to be exposed to needle stick and sharp injuries. Non- reporting or underreporting of these incidents is a serious problem as stated by several authors. The literature search identified the following factors associated with needle stick and sharp injuries: demographic profile: area of assignment, shift schedule, length of service; knowledge of universal precautions, and work practices. They are identified to influence the prevalence of needle stick and sharps injury in the clinical setting.

Though a serious problem, several authors state that needle stick and sharps injuries are preventable. There are control strategies that have been recommended to minimize the risk among health care workers. They are clustered as administrative, safely engineered devices and the use of PPEs. When it comes to the cost of implementation, the administration has this dilemma: if the institution affords to procure the safety-engineered devices? Or if the institution affords not to, how will the institution deal with the occupational hazards and the consequences thereof?

1.6 Conceptual Framework

Needle stick and sharps injuries have an impact on health care workers. Review of literature showed that there are several factors surrounding needle stick and sharps injuries. These include demographic variables such as the occupation, area of assignment, length of service, and shift schedule; knowledge on universal precautions; and work practices. Associated factors affecting needle stick and sharp injury (independent variable) represent relationship to acquiring needle stick and sharps injuries (dependent variables) in the clinical setting.

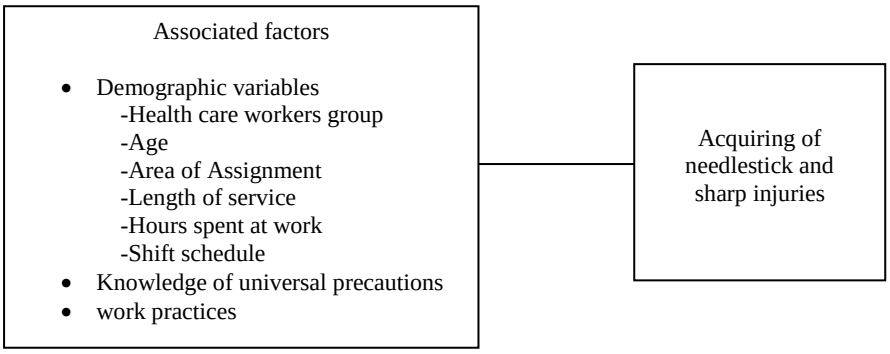

Fig.1. Relationship of the associated factors and acquiring of needlestick and sharps injuries

1. 7 Statement of Hypothesis

The interplay of variables presented in the conceptual framework led to testing the following hypothesis:

Ha1. There is a significant relationship between acquiring needle stick and sharp injuries and:

a. demographic variables regarding:
   a.1 Health Care Workers group
   a.2 Age
   a.3 Area of assignment
   a.4 Length of service
   a.5 Hours at work per shift
   a.6 Shift schedule
b. knowledge of universal precautions
c. work practices

Ha2. There is a significant difference between knowledge on universal precautions and work practices among health care workers in selected military hospitals.

2. METHODOLOGY

2.1 Study Design

This study utilized a descriptive-correlation design. A survey method was utilized to collect the data.

2.2 Study Setting

The study was conducted in selected four (4) military hospitals in Luzon. These four (4) AFP military hospitals are Philhealth accredited. They were selected for the study because these are the premier hospitals of the Armed Forces of the Philippines. With the exemption of AFPMC, the three (3) other general hospitals (AGH, AFGH, and CNH) are comparable regarding services it provides and qualifications of healthcare providers.

2.3 Population and Sampling Technique

Four (4) health care workers' groups- physician, nurses, medical technologists and ancillary staff were selected based on the following criteria:

Inclusion Criteria:

a. Military and civilian healthcare workers, with a minimum employment experience of three (3) months in the four (4) military hospitals.
b. those who consented to participate in the study

Exclusion Criteria:

a. Those who were on leave at the time of the study
b. Those who were not willing to participate in the study
c. Those who were mainly performing administrative duties

2.4 Sampling

Stratified random sampling was utilized to select the respondents. The total number of health care workers was identified. Each health care workers were stratified according to their occupational group (physician, nurses, med tech and ancillary groups). The table for random numbers was used to determine random samples per stratum.

2.5 Sample Size

Using NCSS-PASS 2008 software, the minimum sample size requirement was computed to be 264 using the following parameters for logistic regression analysis: alpha (α)= 0.05, power (1-β) = 80%, P0 (NSSI among healthcare worker working more than 1 year) = 61%, P1 (NSSI among healthcare worker working less than 1 year) = 77%, and X1 (proportion of healthcare worker working less than 1 year among population) = 44.34%.

An oversampling of 10% was considered in computing the sample size. Thus, a total of 290 sample size was taken including the computed attrition rate. Out of the 290 questionnaires (including the oversampling), 269 were returned, but only 262 were completely answered. Thus a response rate of 99.24% was achieved.

2.6 Data Collection Procedure

There were two (2) methods employed to collect data, 1) records review of cases of needle stick and sharps injuries, and 2) administered a self-report questionnaire. An English and Filipino version of the tool was distributed to professional health care workers and nonprofessional respondents. The data collection was conducted for one month after ethics approval was granted.

2.7 Data Collection Instrument

The questionnaire was patterned after internationally-based studies conducted among health care workers (Rampal et al, 2010). The questionnaire was modified by consulting a military doctor who is an epidemiologist, and two (2) infectious control nurses. Their comments on the relevance and appropriateness of the questions were obtained. Face validity of the tool was ensured. The tool was also translated into Filipino. The translated tool was used for the ancillary group which includes nursing attendants and assistants. They considered the non-professional group. Then, a back translation by another two (2) nurses was conducted on a separate occasion. The translated tool was pilot tested to 10 nursing attendants at Philippine General Hospital. A reliability score of Cronbach alpha of 0.82 was achieved and considered acceptable.

2.8 Data Analysis

Data were encoded in Microsoft Excel and was analyzed in SPSS Version 17.

Both descriptive and inferential statistics were used. Frequency, percentage, mean and standard deviation were used to describe the prevalence of needle stick and sharps injuries among the four (4) health care worker's groups. Frequency and percentages were utilized in knowledge on universal precautions and work practices, and the needle stick and sharps injuries history.

Chi-Square test and Spearman's rho determined the relationship between occurrence of NSSI and the selected factors,

All tests were pre-set at $p<0.05$ level of significance.

2.9 Ethical Considerations

The ethical approval of the study was obtained from the Ethics Review Board of the University of the Philippines, Manila and the AFPMC Ethics Review Board.

3. RESULTS AND DISCUSSION

3.1 Demographics

Nurses comprised the most number of respondents with 46.6% of the total respondents while the medical technologists (8.4%) are the smallest in number. Majority of the respondents were middle age (mean=35.85, SD=11.27). Most respondents belong to 26-30 age group with 24.4%, female (68.3%). Majority of them were assigned to the Emergency Room (32.4%). The smallest number of respondents came from the Pediatric Ward (3.7%). The average number of years practicing the profession is 9.95 (SD=10.30). More than half of the health care workers who participated in the study were practicing their profession for less than ten years. Most of them were in the clinical area and working for eight (8) work hours (77.5%), under the category 'other shift schedule.'

Table 3. Socio-demographic Characteristics of Respondents

Characteristics	**Frequency (f)**	**Percent (%)**	**Mean (M), Standard Deviation (SD)**
	N=262		
Health care workers group			
Physicians	56	21.4	
Nurses	122	46.6	
Medical Technologists	22	8.4	
Ancillary Staff	62	23.7	
Age			35.85 (11.27)
51 and above	35	13.4	
46-50	17	6.5	
41-45	24	9.2	
35-40	41	15.6	
31-35	31	11.8	
26-30	64	24.4	
21-25	50	19.1	
Gender			
Male	79	30.2	
Female	179	68.3	
Area of Assignment			
Emergency Room	85	32.4	
Operating Room / Recovery Room	13	5.0	
Intensive Care Unit	27	10.3	
Medical/ Surgical Wards	56	21.4	
Pediatric Wards	10	3.7	
Obstetrics-Gynecology Wards	26	10.0	
Nursery/ Neonatal Intensive Care	26	10.0	
Clinical Laboratory	19	7.2	
Length of Service			9.95 (10.30)
>30 years	19	7.3	
26-30 years	16	6.1	
21-25	12	4.6	
16-20	13	5.0	
11-15	22	8.4	
6-10	52	19.9	
1-5	107	40.7	
>1 year	21	8.0	
Hours at work per shift			
8 hours	204	77.9	
12 hours	4	1.5	
>12 hours	54	20.6	
Shift schedule			
7-3	89	34.0	
3-11	49	18.7	
11-7	23	8.8	
Others	97	37.0	

Table 4. Knowledge of Universal Precautions and Work Practices

Items	Response	Frequency (f)	Percentage (%)
1. Do you know about universal precautions guidelines?	Yes	247	94.64
	No	14	5.36
2. Do you know about the needleless safety device?	Yes	211	80.53
	No	51	19.47
3. Can Hepatitis B be transmitted by needle stick and sharps injuries?	Yes	258	98.85
	No	3	1.15
4. Can Hepatitis C be transmitted by needle s 5. tick and sharps injuries?	Yes	230	87.79
	No	32	12.21
6. Can HIV be transmitted via needle stick and sharps injuries?	Yes	251	95.80
	No	11	4.20
7. Do you need to wear gloves during phlebotomy?	Yes	192	96.0
	No	8	4.0
8. Do you use gloves during phlebotomy?	Yes	171	68.67
	No	78	31.33
9. Do you wear gloves when withdrawing a needle from a patient?	Yes	102	51.0
	No	98	49.0
10. Should needles be recapped/bent after use?	Yes	99	49.50
	No	101	50.50
11. Do you recap the needles after use?	Yes	186	70.99
	No	76	29.01
12. Do you disassemble used needle or sharp with your hands?	Yes	115	43.89
	No	147	56.11
13. Do you wear gloves when disposing of contaminated needles and sharps?	Yes	179	68.32
	No	83	31.68
14. Do you separate the needle from the syringe prior disposal?	Yes	164	62.60
	No	98	37.40
15. Do you throw used needle or sharps in the sharps bin immediately?	Yes	256	97.71
	No	6	2.29
16. Do you wear gloves when manipulating the sharp bin?	Yes	215	82.06
	No	47	17.94
17. Do you need to report needle stick and sharps injuries?	Yes	256	97.71
	No	6	2.29

On respondent's knowledge on universal precautions, the majority of the respondents responded ‘Yes’ (94.64%). Majority of the respondents claimed that they are aware of needleless safety devices (80.53%). It is quite impressive that there are 80.53% among the respondents who were aware of this safety-engineered devices- IV needleless system or innovation

about needles at this time. The respondents were asked whether Hepatitis B can be transmitted by needles stick and sharps injuries, it is noteworthy that 98.85% responded positively. In the same manner that they were asked if HIV can be transmitted via needles stick and sharps injuries, 251 responded 'Yes.' However, there were still 1.15 % and 4.20% that answered that these two (2) blood borne pathogens- Hepatitis B and HIV respectively could not be transmitted via needle stick and sharps injuries. When asked if there is a need for gloves during phlebotomy procedure. Most of the respondents responded in affirmative. On the contrary, there was a lower turn-out by 27.33% when asked if they use gloves during phlebotomy (68.67%). A follow-up question was asked if the respondents wear gloves when withdrawing a needle from a patient, only about half say 'Yes.' With regards to recapping and bending of needles after use, almost half of the sample population had this misconception that there is a need to recap or bend needles (99, 49.5%) after use. Moreover, when asked about their practice on recapping, most of the respondents claimed they also recap needles after use (70.99%), and they disassemble needles or sharps with hands (56.11%). It was remarkable that majority responded that they wear gloves when disposing of contaminated needles and sharps (68.32%) and in manipulating sharp bins (82.06 %).

Table 5. Test of Difference in the Knowledge of Universal Precautions and Work Practices among Healthcare Professionals

VARIABLES	***t- value***	***p***
Knowledge of universal precautions	-2.418	0.05
Work practices	13.24	0.00

Table 6 revealed significant difference in the knowledge on universal precautions (t= -2.418, p=0.05) and work practices (t=13.24, p=0.00) among health care professionals. The most common activity to which lead to needle stick and sharp injuries is before item use (75, 32.90%). Other activities that lead to needle stick and sharp injuries were: recapping of needles (21.9%), disassembling needle or sharp devices (14%), during use of item (14%); after use of item, before disposal (24, 10.5%); and disposal of needles and sharps (67%). On the other hand, the most common type of device identified that caused the injury are glasses such as ampules, vacuum tube, etc. Most the respondents reported that they did not wear gloves when sharps penetrated their skin (64%). Thirty-two percent were wearing a single pair of gloves, and only a few were wearing a double pair of gloves (3.6%) when the sharps penetrated their skin. This shows inconsistencies with regards to following standard precaution in handling

body fluids and other safety guidelines. When asked of what was their action after the injury, the majority answered they 'washed the injury with water/ water and soap' (47%) while 31% went all the way to undergoing post-exposure prophylaxis protocol.

Table 6. Needlestick and Sharps Injuries (NSSI) History

Variables	Frequency (f)	Percentage (%)
Activities at the time of needles stick and sharp Injuries		
Before use of item	75	32.9
Recapping needles	50	21.9
Disassembling needle or sharp devices	32	14.0
During use of item	32	14.0
After use of item, before disposal	24	10.5
Disposal of needles and sharps	15	6.7
Type of device that caused the injury		
Glass (ampules, vacuum tubes, etc.)	80	34.0
Hypodermic needles attached to a syringe	58	25.0
Prefilled syringe needle	38	16.0
Surgical instruments/ sharps	25	11.0
Winged butterfly needle	10	4.2
Lancet for skin prick	10	4.2
Others	8	3.4
Intravenous catheter stylet	7	3.0
In hand injury, sharp items penetrate		
Was not wearing any gloves at all	107	64.0
Single pair gloves	54	32.0
Double pair gloves	6	3.6
Action after the injury		
Cleaned with betadine/ disinfectant	89	36.0
Underwent post-prophylaxis protocol	31	12.0
Washed with water/ water and soap	11	47.0
Others	8	3.2
Reported the incident		
Yes	64	56.14
No	50	43.86
Reasons for not reporting		
Item was unused	63	43.7
Being too busy	44	30.0
Not significant/ did not know it is worth Reporting	18	12.0
Belief that HBV is sufficient	7	6.1
Did not know whom to report	7	4.8
Fear of punitive response	4	2.7
Others	1	0.7

Table 7. Relationship between occurrence of Needlestick and Sharps Injuries and selected variables

Variable	Description	Freq.	%	χ^2/p	*the*
Health care worker group	*Physicians*	24	42.86	19.98	0.00[1]
	Nurses	46	37.70		
	Med Tech	11	50.00		
	Ancillary Staff	37	59.68		
Area of Assignment	*Emergency Rm*	45	52.94	12.15	0.14
	Operating Rm/RR	7	53.85		
	ICU	8	29.63		
	MS wards	25	44.64		
	Pediatrics	2	28.57		
	OB-Gyne	10	38.46		
	Nursery/NICU	10	38.46		
	Clinical Lab	11	61.11		
Years practicing	*>30 yrs*	10	52.63	-0.09	0.16
	26-30	10	62.50		
	21-25	6	50.00		
	16-20	4	30.77		
	11-15	6	27.27		
	6-10	22	42.31		
	1-5	49	45.79		
	>1 yr	11	52.38		
Hours at work per shift	*8 hours*	91	44.61	-0.01	0.90
	12 hours	3	75.00		
	>12 hours	24	44.44		
Shift schedule	*7-3*	47	52.22	0.06	0.33
	3-11	20	40.00		
	11-7	9	36.00		
	others	42	43.30		
Knowledge of universal precautions	-0.15	0.01[1]			
Work practices	-0.14	0.01[1]			

[1]*Significant at p-value = <0.05*

The findings showed that there is significant relationship between occurrence of needle stick and sharp injuries and occupation (χ^2=19.98, p=<0.05), age χ^2= (-0.16), p=<0.05) knowledge on universal precaution (χ^2= (-0.15), p=<0.05) and work practices (χ^2= (-0.14), p=<0.05) as shown in Table 7. However, the years of practicing the profession and hours spent per shift and occurrence of needle stick and sharp injuries have no significant relationship with needle stick and sharp injuries.

4. DISCUSSION

Although the knowledge or awareness of universal precautions and other concepts related to transmission of blood borne pathogens via needle stick injuries were high, a gap between knowledge and practice is still noted. The results from this study revealed high awareness on universal precautions and needle and sharp safety precautions; however, it revealed a quite low result on how they perform the procedures such as gloving and handling and disposal of needles and sharps. This only means that universal precaution is not practiced religiously.

As to needle stick and sharp injury history, 144 (55%) of the respondents had experienced needle stick and sharp injuries. It is quite high as compared to related literature reviews. Turao (2012) found out that the prevalence of needlestick injuries in one (1) military hospital from 2011-2012 was 3.5% or 92 cases of needle stick injuries for two (2) years which is lowered as compared to the present study.

The most common activity when the injury was incurred was before the use of an item, followed by recapping of needles and the least response was during disposal of needles and sharps. On the contrary, recapping of needles has been the most frequent cause of needle stick injuries in most studies, in which the practice has been strictly prohibited under the Blood borne Pathogen Standard by the Occupational Safety and Health Administration (OSHA). This further supported the study findings of Rampal et al. (2010) showing that recapping needle is the number 1 reason why healthcare workers sustain needle stick injuries. Moreover, Bekele et al. (2015) found out that the highest prevalence of occupational needlestick and sharp injuries were observed among HCWs in Southeast Ethiopia who practiced needle stick recap after use as compared to those HCW who had not a history of recapping. HCW who practiced needle recapping were three times more likely to experience injuries than who did not recap. This dangerous practice could be attributed to the complacency of the staff in most cases when performing procedures involving use of needles and sharps. This is further proven in this present study in which sixty-four percent (64%) of those who had needle stick and sharp injuries were not wearing gloves when the injury happened.

The most common types of devices that can cause injury are glasses such as ampules, and vacuum tubes, which usually occur in an unprotected hand. The least common device that caused injuries is the intravenous catheter stylet.

Majority of the respondents claimed that they cleaned the injured part with water/water and soap (47%) while very few (12%) went all the way to undergo post-exposure prophylaxis. This means that staffs involved with needle stick and sharp injuries did an action immediately on their own, not observing the proper precautionary measures after an incident. Only 56.14% of those who had injury reported the incident.

Present findings showed a significant relationship between prevalence of needle stick injuries and health care workers group (χ^2=

19.98, $p<0.05$). A certain degree of exposure can be based on individual tasks as evident among occupations. Patrician et al. (2011) agreed that risk for needle stick and sharp injuries were higher in groups with lower skill level relative to their academic degree. On the contrary, in this particular study, it is the ancillary staffs that have the low skill level. Though nurses are supposed to be educated and trained on needle stick and sharp safety, they are more exposed to occupational hazards. The reason can be attributed to nurses having the highest risk for sharps-related injuries especially those working at the bedside (Jagger, 2003). This is also supported by a study in Japan showing that three-quarters of reported injuries were sustained by nurses (Smith, 2009). Moreover, age is significantly related to needle stick and sharp injuries (p=-0.16, $p<0.05$). A negative relationship was however found. This is interpreted that as the younger the health care workers are, the more likely that they acquire needle stick and sharp injuries. The result of this study can be explained that age of the health care workers is associated with the occurrence of needlestick and sharps injuries.

Furthermore, a significant relationship was noted between the prevalence of needle stick and sharp injuries and the knowledge of universal precautions and work practices. The less aware the health care workers are on the guidelines on universal precautions, the more these health care workers will incur needle stick and sharp injuries. Likewise, if these health care workers will not perform correctly the guidelines, it is more likely for them to incur needle stick and sharp injuries. All other variables in this study proved no significant relationships to prevalence of needle stick and sharp injuries: area of assignment, years of practicing the profession, hours of work per shift, and shift schedule

There was significant difference between the group with needle stick and sharp injuries and the group without needle stick and sharp injuries in the following areas: health care workers group and knowledge of universal precautions & work practices. Patrician et al., (2011) agreed that risk for needle stick and sharp injuries were higher in groups with lower skill level relative to their academic degree. On the contrary, in this particular study, it is the ancillary staffs that have the low skill level. Though nurses are supposed to be educated and trained on needle stick and sharp safety, they are more exposed to occupational hazards. The reason can be attributed to nurses having the highest risk for sharps-related injuries especially those working at the bedside (Jagger, Perry, & Parker, 2003). The knowledge on safe handling of needles and sharps can protect health care workers from occupational risks that may lead to acquiring blood borne pathogens. Thus, it is strongly related to needle and sharp injuries regardless of committing/ not committing the event. The awareness to universal precautions alone does not provide enough protection of healthcare workers to needle stick and sharp injuries, but rather it should be combined with the practice of needle stick safety to provide the needed protection against any occupational hazards. However, there was no significant difference found out between the group with and the group without needle stick and sharp

injuries regarding age, the area of assignment, length of service, hours of work per shift and shift schedule. Mbaisi et al, 2013 revealed that those who are below 40 years of age among health workers in Kenya are more at risk to needle stick and sharp injuries. Similarly, Martins et al (2012) reported that it is the older group of health care workers, specifically those who are over 39 years of age who are more at risk to needle stick and sharp injuries. However, a contradicting finding was found in this study. Regardless of the area of assignment, the different health care worker group can still be exposed to needle stick and sharp injuries suggesting that area of assignment does not correspond to the occurrence of needle stick and sharp injuries. However, the present findings contrasted to a multivariate logistic regression conducted by Martins et al (2012) showing that the strongest risk to needle stick and sharp injuries was having more than ten years or more of work in the health services. The present findings could be attributed to the normal age distribution of the respondents compared to Martin and others whose respondents were almost 20 years older in the service.

Further, it was also found out there is also a significant relationship between knowledge on universal precautions and work practice and prevalence of needle stick and sharp injuries. The less aware the health care workers are on the guidelines in universal precautions, the more these health care workers will incur needle stick and sharp injuries.

5. CONCLUSION

The factors that were pre-identified were tested if they are significantly related to needle stick and sharp injuries. Only four factors showed a significant relationship- occupation, age, knowledge of universal precautions and work practices.

The study revealed that the health care workers are aware of the risks associated with needle stick and sharp injuries; however, it is not duly reflected in their work practices. Moreover, there are existing gaps in the implementation and monitoring of the safety guidelines, hence the inconsistencies in their responses under work practice. Most of the respondents were aware of the basic guidelines of universal precautions; however, when asked if they had been observing it, some were not strictly complying with the guidelines.

A significant difference was noted among the variables: occupation, and work practice. The risk for needle stick and sharp injuries were higher among health care workers group. By association, work practice is important in needle stick and sharps safety. This can be supported by the high degree of exposure to occupational hazards for these health care workers. Physicians, nurses, medical technologists and ancillary staff may have different work environments and specific tasks, but nevertheless, these make them equally prone to incur occupational injuries.

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