

# Compliance with sharps injury prevention guideline among nurses in tertiary care hospitals in the Philippines

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## Abstract

This study employed descriptive survey method to determine level of compliance and extent of factors affecting staff nurses to sharps injury prevention guideline. Self-administered questionnaire was the main instrument in obtaining data. Respondents were purposively selected 237 staff nurses from two government tertiary-care hospitals in the Philippines, with a response rate of 100%. It revealed that respondents are generally compliant (before procedure: mean - 4.44, during procedure: mean - 4.34) in guidelines of preventing sharps injuries, but less likely (mean - 4.10) compliant after any sharps' procedure, and it was noted that recapping of used needles still practiced in hospital setting (mean - 3.72). And policies and procedures (mean - 4.12), education and training (mean - 3.99), and resources (mean - 4.06) as factors are more likely to influence their compliance in sharps injury prevention guideline. The non-compliance of staff nurses their precautionary measures after procedure is likely to give rise to accidental sharps injuries. However, staff nurses are more decisive to comply on methods of preventing sharps injuries once hospital institutions develop policies and procedures, implement continuous education and training, and ensure availability of resources.

**Keywords:** Needlestick injuries and prevention and control; Practice guidelines as topic; Compliance; Nurses.

## Introduction

Precautionary and safety measures must be resolutely considered in every workplace to minimize untoward incidents and to ensure safety of health workers. The implementation of sharps injury prevention policies or guidelines would facilitate hospital institutions in

reassessing quality of efforts or programs for ensuring safety of staff nurses. Workplace safety, particularly sharp injuries, is top concern of nurses.<sup>1</sup> The policies that are carefully implemented may offer hospitals a perspective for change and an opportunity to further educate and train their staff nurses about measures

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of preventing, recording, and reporting of sharps injuries. It is the collection of data regarding sharps injuries; and the identification of initiatives to develop staff, enhance programs, and improve trainings are apparent methods in evaluating institutions' existing sharps injury prevention programs. Several studies indicated that healthcare organizations linked safety culture with both employee compliance and safe work practices will eventually reduce exposure to blood and other body fluids and sharps-related injuries. By having safety cultures with consistently report fewer sharps injuries than organization with weak safety cultures, primarily because of policies and procedures have integrated in the management and programs, a need for education and training, including availability of resources are paramount to the compliance and commitment to safety guidelines.<sup>3,6,7,8</sup>

One of the looming safety concerns worldwide is on sharps injuries that happened in the hospital setting. In a report by Center for Disease Control and Prevention (CDC) there is an estimated 600,000 to one million needlestick injuries occurring each year in the world, and about half of which went unreported.<sup>2</sup> Reports also stressed that overwhelming majority in both the above numbers involved healthcare workers working at bedside.<sup>2</sup> However, in the Philippines, a total of 4,004 health care providers were reported to have acquired needle stick injuries in 2004.<sup>3</sup> This includes nurses, other patient-care providers, laboratory staff, and support personnel. Nurses which corroborate the findings were predominantly occupational group injured by needles and other sharps, which CDC and American Nurses Association claim that nurses sustained highest number of percutaneous injuries related to sharps and needles from among all surveyed health workers.<sup>2,4,5</sup> Despite having sharps injury prevention guidelines, it is imperative to find out nurses' compliance to these guidelines and to determine factors influencing the nurse's compliance to safety guidelines.

Because of increasing sharps-related injuries among healthcare workers albeit existing sharps injury prevention guideline in hospitals, this study aimed to determine the compliance towards policies and practices in the prevention of sharps injury and the factors influencing staff nurses in complying with the guideline/ policy.

## **Methods**

### ***Study Design, Setting and Population***

This study used descriptive survey method, which involved collection of data to answer research questions.<sup>9</sup> It was carried from January 2010 to March 2011. This study sought permission and approval from the chief nurses of the two hospitals before the selection of respondents and administration of questionnaires. Because of deployment of volunteer nurses or nurse trainees, and job orders or contractual nurses in different areas, inclusion criteria was employed in the selection of respondents: they should be employed as regular (permanent) staff nurses and working in Medicine ward, Surgery ward, Obstetrics/ Gynaecology ward, Paediatric ward, Psychiatric ward, Emergency room, Intensive Care Units (Neonatal Intensive Care Unit, Medical Intensive Care Unit, and Surgical Intensive Care Unit), Operating room, Delivery room, and Out-Patient Department; thus, 237 regular staff nurses were selected as respondents, and a response rate of 100% was achieved.

### ***Research Instrument***

Self-administered questionnaire was divided to three components: (a) demographic profile which includes age, sex, years of clinical experiences, and areas of clinical assignment; (b) level of compliance to sharps injury prevention guideline; and (c) extent of factors affecting compliance to sharps injury prevention guideline. Respondents were asked to check always comply, often comply, sometimes comply, seldom comply and fairly comply to compliance of sharps injury prevention guideline; and always affect, often affect, sometimes affect, seldom affect and fairly affect to extent of factors affecting their compliance to sharps injury prevention guideline that appropriately corresponds to their answers. The validity of the tool was checked by Infection Control Nurses but as a coefficient of reliability, the tool was pre-tested by 35 staff nurses in other tertiary level hospital using Cronbach's Alpha and obtained a value of 0.92.

### ***Statistical Analysis***

After the questionnaires were reviewed and manually tallied. The data was analysed by SPSS version 14.0 for frequency counts, percentages and weighted means.

## Results

### Study population

Most of respondents were aged 21-25 years old ( $n=160$ , 67.51%), females ( $n=179$ , 75.53%), 0 month to 1 year of clinical experience ( $n=158$ , 66.66%), and working in medical- surgical areas ( $n=82$ , 34.60%) (Table I).

### Level of compliance of staff nurses in prevention of sharps injuries before, during and after procedure

Table II shows the staff nurses' level of compliance in preventing sharps injuries before conduct of a procedure. The general weighted mean is 4.44, which means that staff nurses always comply with techniques, measures, or procedures in preventing sharps injuries.

**Table I. Profile of respondents**

		Frequency	Percentage (%)
Age	21- 25	160	67.51
	26- 30	26	10.97
	31- 35	20	8.44
	36- 40	9	3.80
	41- 45	12	5.06
	46- 50	10	4.22
	<b>Total</b>	<b>237</b>	<b>100</b>
Sex	Male	58	24.47
	Female	179	75.53
	<b>Total</b>	<b>237</b>	<b>100</b>
Years of Clinical Experience	0-1 year	158	66.66
	1-2 years	29	12.24
	3- 4 years	19	8.02
	5 and up	31	13.08
	<b>Total</b>	<b>237</b>	<b>100</b>
Area of Assignment	Medical/Surgical	82	34.60
	Obstetrics	40	16.88
	Paediatrics	13	5.49
	Intensive Care Units	21	8.86
	Psychiatric	9	3.80
	Operating Room	27	11.39
	Delivery Room	15	6.33
	Emergency Room	27	11.39
	Out-Patient Department	3	1.26
	<b>Total</b>	<b>237</b>	<b>100</b>

**Table II. Level of compliance of staff nurses in prevention of sharps injuries before a procedure**

Before a Procedure	Mean	Description
1. Ensure availability of equipment and within arm reach.	4.30	Always Comply
2. Checks work environment for adequate lighting.	4.43	Always Comply
3. Assesses adequacy of space in the work area.	4.20	Always Comply
4. Organizes work area	4.38	Always Comply
5. Ensures sharp is always pointed away.	4.50	Always Comply
6. Identifies location of sharps disposal container.	4.69	Always Comply
7. Determines in advance where reusable sharps will be placed.	4.52	Always Comply
8. Obtains assistance from other staff or a family member if uncooperative, combative and confused patient	4.56	Always Comply
9. Explains to patient importance of avoiding any sudden movement.	4.39	Always Comply
<b>Weighted Mean</b>	<b>4.44</b>	<b>Always Comply</b>

Table III shows the staff nurses' level of compliance in preventing sharps injuries during conduct of a procedure.

All items were rated always comply except number 6, or avoidance of recapping used needles. Findings showed that respondents adhered to basic and necessary activities to be undertaken during procedure and observed all effort to protect themselves from

sustaining sharps injury, thus overall compliance rating of 4.34.

Table IV shows the staff nurses' level of compliance in preventing sharps injuries after conduct of a procedure. There were seven out of the thirteen items, or 46%, that yielded often comply (m- 4.10).

**Table III. Level of compliance of staff nurses in prevention of sharps injuries during a procedure**

During a Procedure	Mean	Description
1. Maintains visual contact with procedure site and location of the sharp device.	4.61	Always Comply
2. Aware of other staff in immediate environment, when handling an exposed sharp.	4.45	Always Comply
3. Controls location of sharps.	4.43	Always Comply
4. Avoids hand-passing exposed sharps.	4.46	Always Comply
5. Uses pre-determined neutral zone or tray for placing and retrieving used needles.	4.32	Always Comply
6. Avoids recapping used needles.	3.72	Often Comply
7. Avoids hand-to-hand passing of needles during venipuncture procedure.	4.36	Always Comply
	Weighted Mean	4.34
		Always Comply

**Table IV. Level of compliance of staff nurses in the prevention of sharps injuries after a procedure**

After a Procedure	Mean	Description
1. Inspects procedure trays, other surfaces for presence of sharps that may have been left inadvertently.	4.36	Always Comply
2. Transports reusable sharps in a closed container.	4.38	Always Comply
3. Inspects sharps container for hazards.	4.27	Always Comply
4. Ensures sharps container being used is large enough.	4.19	Often Comply
5. Avoids bringing hands close to opening of a sharp container.	4.30	Always Comply
6. Keeps hands off tubing with a needle upon disposal.	4.39	Always Comply
7. Maintains control of tubing with a needle upon disposal.	4.26	Always Comply
8. Makes sure safety box is not more than 3- quarter full.	3.65	Often Comply
9. Uses forceps or tongs to remove any protruding devices.	3.81	Often Comply
10. Inspects outside of waste container for protruding sharps.	4.03	Often Comply
11. Keeps filled sharps containers awaiting final disposal in a secure area.	4.09	Often Comply
12. Handles improperly disposed sharp and keeping hands behind the sharps at all times	4.15	Often Comply
13. Uses a mechanical device to pick up sharps.	3.47	Often Comply
	Weighted Mean	4.10
		Often Comply

### ***Extent of factors affecting compliance of staff nurses on sharps injury prevention guidelines***

Policies and procedures (Table V) are safety guidelines provided to all hospital personnel, including nurses which often affect their compliance on sharps injury prevention guideline.

Education and training of staff (Table VI) is another factor that influence compliance of staff nurses on sharps injury prevention guideline that yielded an overall mean of 3.99.

**Table V. Extent of policies and procedures as factors affecting compliance of staff nurses in sharps injury prevention guideline**

<b>Policies and Procedures</b>	<b>Mean</b>	<b>Description</b>
1. Organization's mission, vision, goals/or values reflect healthcare worker safety.	4.12	Often Affect
2. Administration has strategies used to communicate importance of a safety environment.	4.27	Always Affect
3. Administrative support like safety interventions.	4.25	Always Affect
4. Organization has strategies to identify hazards in work environment.	4.21	Always Affect
5. Records of incidents of sharps injuries.	4.08	Often Affect
6. Reporting and dissemination of incidents of sharps injury.	4.08	Often Affect
7 Specifies monitoring and improving prevention of sharps injury.	4.13	Often Affect
8. Depicts application of sanctions of non-compliance of prevention of sharps injury.	3.39	Sometimes Affect
	Weighted Mean	4.12
		Often Affect

**Table VI. Extent of education and training as factors affecting compliance of staff nurses in sharps injury prevention guideline**

<b>Education and Training</b>	<b>Mean</b>	<b>Description</b>
1. Provision of training and updates specifically for staff nurses on prevention of sharps injury.	4.10	Often Affect
2. Ensures healthcare personnel receives training and updates on prevention for sharps injury.	4.04	Often Affect
3. Sharps injury prevention incorporated into in-service presentation or department/ unit meeting discussions.	4.04	Often Affect
4. Hands-on training receives by staff nurses specifically on handling of sharp device.	3.99	Often Affect
5. Availability of training supplies.	3.91	Often Affect
6. Availability of trained personnel to conduct training on sharps injury prevention.	3.90	Often Affect
	Weighted Mean	3.99
		Often Affect

**Table VII. Resources as factors affecting compliance of staff nurses in prevention of sharps injuries**

Resources	Mean	Description
1. Adequate supplies (like gloves, masks, goggles).	3.85	Often Affect
2. Available waste containers especially for sharp devices.	4.15	Often Affect
3. Strategic placement of waste container in the area.	4.22	Always Affect
4. Adequate staff or other members of health team.	4.08	Often Affect
5. Availability of trained Infection Control Committee.	3.99	Often Affect
	Weighted Mean	4.06
		Often Affect

Resources are factors that may influence compliance of staff nurses in prevention of sharps injury (Table VII). An overall mean of 4.06 means that resources often effect the nurses' decision to comply with measures that prevent sharps injuries.

### Discussion

This study sought to determine the level of compliance of staff nurses in the prevention of sharps injuries in tertiary care hospitals. It revealed that before any procedure, staff nurses seem to prioritize the identification of location of the sharps disposal containers which is a good practice. Well-engineered devices must be considered, which include sharps disposal containers, needle-less systems, and sharps with engineered sharps injury protection, which means to isolate or remove the blood borne pathogens hazard from the workplace.<sup>2</sup> However, attempts to implement safety-engineered devices only in certain areas or on certain patients would neither be practical nor effective.<sup>10</sup> But CDC already recommended that sharps disposal container must be moveable and be placed near point-of-use to facilitate immediate disposal of all sharp devices.<sup>2</sup> This corroborates the results of a study that incidence of accidental sharps injuries was found to be decreased if disposal containers were readily visible and movable, placed within easy horizontal reach of user, and designed to prevent overfilling.<sup>12,13</sup> Another issue that is indicated in the results is an increased need of more staff nurses and other workers to control, calm, or restrain a patient during a procedure or treatment that involves sharps or needles. This suggests that availability of other staff nurses and family members or significant others play a key role in lessening incidence of possible sharps injury in the workplace. As shown from some studies, unexpected movement is one of the common causes of percutaneous injuries of healthcare workers.<sup>10,13</sup> Also,

Exposure Prevention Information Network (EPINet) supports the importance of the compliance of more staff nurses when handling aggressive or combative behaviour of a patient which healthcare workers are placed at greater risk for accidental percutaneous injuries.<sup>14</sup> In addition, staff nurses always maintain a close visual contact when working with any procedure or treatment that involves sharps or other instruments. It revealed that most of the results pointed out towards the avoidance, awareness, and control over the anticipated accidental injuries because of interventions that involves sharps or needles.

Staff nurses always use pre-determined neutral zone or tray for placing and retrieving used needles. CDC suggested that ideal device for a neutral zone should be large enough to hold sharps, not easily tipped over, and preferably mobile.<sup>2</sup> CDC strongly recommends not to pass contaminated sharps from one person to another to prevent possible accidental sharps injury to others.<sup>2</sup> But, avoiding recapping of used needles ranked seventh among all the items and revealed that it is still practiced. This is supported by one study which revealed that a third of all their respondents always recapped needles, and compliance with non-recapping of used needles was highest among trained nurses and worst among doctors.<sup>15</sup> Although recapping may be necessary when multiple injections from a single syringe are required, National Institute for Occupational Safety and Health (NIOSH) advised that nurses must not recap or bend or cut needles but dispose of them immediately into approved, puncture-proof containers.<sup>17</sup> Further, risk for sharp injuries have been related to certain work practices such as recapping, transporting body fluids between containers, and failing to properly dispose of used needles in puncture-resistant sharps container.<sup>17</sup> After procedure, respondents always check trays and patient's bed for presence of sharps to avoid injury to

patient. CDC suggested that all staff members should report any incident of losing sharps at workplace and that needle disposal boxes should be placed as close to patient's bed as reasonably possible for immediate disposal of used sharps.<sup>2</sup> Needle disposal containers were found to be problematic when they were initially introduced to healthcare environment because overfilled containers, inconvenient container locations and carelessness in disposal practices often lead to accidental sticks.<sup>16</sup> Rated lowest is the use of a mechanical device to pick up sharps which reveals failure on the part of the nurse to perform proper handling, and use their bare hands in picking these objects instead. As indicated in this study, the findings are risks that involve sharp injuries and these have been related to certain work practices such as recapping, transporting body fluids between containers, and failing to properly dispose of used needles in puncture-resistant sharps container.<sup>17</sup>

Records of incidents of sharps injuries and report and dissemination of incidents of sharps injuries both often affect nurses' decision to comply. It is strongly recommended that preventing needle stick and sharps injuries should be the aim of all healthcare professionals.<sup>19</sup> Moreover, it should be stressed that a staff should be encouraged and be supported to report injuries, and include a detailed account of the equipment involved, healthcare professional affected, together with circumstances surrounding injury.<sup>20</sup> It revealed in the findings that monitoring and improving materials in the prevention of sharps injury often affects nurses' decision to comply. This further imply that monitoring tools in the prevention of sharps injuries, which includes recording and reporting incidence of sharp injuries, are not that well implemented. It should be reiterated that surveillance systems must be enhanced with specified monitoring tools to be used in tracking whether interventions put into place significantly and effectively reduce cases, and in identifying potential risk factors associated with needle stick injuries.<sup>20,21</sup> However, in the application of sanctions for non-compliance sometimes affect them in complying to sharps injury guideline. This implies that the provision of more effective measures is more acceptable than the idea of imposing punishment. This include, the reiteration of effective sharps injury preventive measures that include

administrative and work practices must be employed in order to prepare nurses for the prevention of any sharps injury.<sup>21</sup> This strongly suggests that education and training, and resources more likely influence their compliance, which entails appropriate and prerequisite to ensure that the guidelines are being practiced. Conversely, the respondents considered foremost that administration have to employ strategies or any means used to communicate importance of a safe environment that always affect their compliance to sharps injury prevention guideline. This is supported by some studies that existing policies and procedures, continuous education and training, and availability of resources are important to ensure implementation of a safety culture for nurses working in a hospital environment.<sup>6,7,8</sup>

### **Conclusions and Recommendations**

Staff nurses adhere to safe working practices before commencement of a procedure and during conduct of procedures involving use of sharps or needles by which primary prevention is the most direct method of preventing needle stick or any sharp injuries. But staff nurses adhere less to guidelines after procedure and disposal of used sharps or needles. Factors such as policies and guidelines, education and training, and resources greatly influence their compliance to sharps injury prevention guideline. There should be a continuous improvement program on safe working practices involving the use of sharps or needles that must be followed throughout, starting from the commencement of a procedure to disposal of used sharps or needles. Policies and procedures, education and training and resources should be addressed by hospital and strictly implemented for the prevention of sharp injury. Without these, compliance of staff nurses may be at stake.

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## References

- American Nurses Association. Workplace Safety and Needlestick Injuries are Top concern for Nurses, 2008. <http://www.ana.org/> (Accessed August 10, 2010)
- Center for Disease Control and Prevention. Workbook for Designing, Implementing, Evaluating a Sharps Injury Prevention Program. Center for Disease Control and Prevention, 2008. <http://www.cdc.gov/sharpssafety/> (Accessed 12<sup>th</sup> July 2010).
- Padilla RR, Rogado MI, Tagalog E, America E. Needle Stick Injury: Philippine Perspective. *Philippine Journal of Nursing* 2006; **76(1)**: 3-6.
- American Nurses Association. American Nurses Association's Needlestick Prevention Guide. Washington DC 2002. <http://www.ana.org/> (Accessed 12<sup>th</sup> July 2010).
- American Nurses Association. American Nurses Association Workplace Health and Safety Guide for Nurses: OSHA and NIOSH resources. Washington DC, ANA Publishing, 2001. <http://www.ana.org/> (Accessed 12<sup>th</sup> July 2010).
- Ebrahimi H. Needlestick Injuries among nurses. *Journal Research Health Science* 2007; **7(2)**: 56- 62.
- Nsubaga FM, Jaakala MS. Needlestick injuries in Sub-Saharan African. *Tropical Medicine and International Health* 2005; **10(8)**: 773- 781. <http://dx.doi.org/10.1111/j.1365-3156.2005.01453.x>
- Alshehab M, Mutawa F, Abdul-Nabi I, Neama S, Al Jowder M. Knowledge and practices among nurses about needlestick injury (2008). Retrieved from [www.nursingworld.com](http://www.nursingworld.com)
- Burns N, Grove S. Understanding Nursing Research: Building an Evidenced-Based Practice. 4<sup>th</sup> ed. Elsevier (Singapore) Pte Ltd. 2007; 237.
- Perry J, Robinson ES, Jagger J. Needlestick and sharps-safety survey. *Nursing* 2004; **34(4)**: 43- 47. <http://dx.doi.org/10.1097/00152193-200404000-00041>
- Haiduven DJ, Phillips ES, Clemons KV, Stevens DA. Percutaneous Injury Analysis: consistent categorization, effective reduction methods, and future strategies. *Infection Control and Hospital Epidemiology* 1995; **16(10)**: 582-589. <http://dx.doi.org/10.2307/30141098>
- Haiduven DJ, Simpkins SM, Phillips ES, Stevens DA. A survey of percutaneous/ mucocutaneous injury reporting in a public teaching hospital. *Journal of Hospital Infection* 1999; **41**: 151-154. [http://dx.doi.org/10.1016/S0195-6701\(99\)90053-1](http://dx.doi.org/10.1016/S0195-6701(99)90053-1)
- Adegboye AA, Moss GB, Soyinka F, Kreiss JK. The Epidemiology of needlestick injury and sharps instrument accidents in a Nigerian hospital. *Infect Control Hosp Epidemiol* 1994; **15(1)**: 27-31. <http://dx.doi.org/10.2307/30148382>
- Exposure Prevention Information Network. International Healthcare Worker Safety Center. <http://www.healthsystem.virginia.edu/internet/epinet/epinet4.cfm>. (Accessed 12<sup>th</sup> August 2010)
- Sadoh WE, Fawole AO, Sadoh AE, Oladimeji AO, Sotiloye OS. Practice of universal precautions among health workers. *Journal of National Medical Association* 2006; **98(5)**: 722-726.
- National Institute for Occupational Safety and Health (NIOSH). Selecting, evaluating, and using sharps disposal containers. *DNNS (NIOSH) Publication* No. 97- 111.
- Rosenstock L. Statement for the Record on Needlestick Injury. National Institute for Occupational Safety and Health (NIOSH). Center for Disease Control and Prevention, 2008. <http://www.cdc.gov/niosh/> (Accessed 15<sup>th</sup> August 2010)
- D'Arco SH, Haegreaves M. Needlestick Injuries. A Multidisciplinary Concern. *Nursing Clinics of North America* 1995; **30(1)**: 61-67.
- Gabriel J. Reducing needlestick and sharps injuries among healthcare workers. *Nursing Standards* 2009; **23(22)**: 41-44. <http://dx.doi.org/10.7748/ns2009.02.23.22.41.c6777>
- Clarke SP, Sloane DM, Aiken LH. Effects of hospital staffing and organizational climate on needlestick injuries to nurses. *American Journal of Public Health*, 2002; **92 (7)**: 1115-1119. <http://dx.doi.org/10.2105/AJPH.92.7.1115>
- Clarke SP, Rockett JL, Sloane DM, Aiken LH. Organizational climate, staffing, and safety equipment as predictors of needlestick injuries and near-misses in hospital nurses. *American Journal of Infection Control*, 2002; **30(4)**: 207-216. <http://dx.doi.org/10.1067/mic.2002.123392>