



**BE BRAVE: AN INNOVATIVE APPROACH TO INCREASING LEVEL OF AWARENESS AMONG HEALTHCARE WORKERS ON THE PREVENTION AND REPORTING OF NEEDLE STICK INJURIES IN DLSMC**

**Mark Angello C. Ganon<sup>1</sup>, Mary Clare F. Coronel<sup>2</sup>, Fedlyn N. Tonog<sup>2</sup>, Roberto C. Sombillo (Ph.D)<sup>2</sup>, Sheila B. Callao<sup>2</sup>, Lira M. Fontelera<sup>2</sup> and Rosalyn F. Bravo<sup>1</sup>**

<sup>1</sup>Infection Control Coordinator, Delos Santos Medical Center, Quezon City, Philippines

<sup>2</sup>Nursing Service Office, Delos Santos Medical Center, Quezon City, Philippines

**ABSTRACT:** *BRAVE is an acronym for **B**leed, **R**inse, **A**nchor, **V**alidate and **E**merge. A two-pronged approach to information dissemination about the importance of reporting as well as an educational material on what to do when one is pricked. Needle stick injuries (NSI) is one of the most frequent routes in occupational health hazard for transmission of various blood-borne infections. This research was conducted to determine the level of awareness and the extent of difference in the prevention and management of needle prick injury. The research was a descriptive-cross sectional comparative design which has assessed the level of awareness of health care professionals in the medical center. Data were condensed utilizing mean and differences were determined utilizing ANOVA. A 10-item survey was formulated to assess awareness on the fundamental elements revolving needle stick injury, which are the risks of infection, importance of reporting, and post-exposure management. Four (4) questions focused on incident reporting, which is a key element in post-exposure management. Three (3) questions were allotted to assess awareness of the risk of needle stick injury in the workplace as well as the risk of a possible infection from the said injury. The remaining three (3) questions evaluate awareness on awareness of the management after injury and preventive measures. A total of 110 respondents were included in the study with 50 nurses, 15 medical technologists, 15 medical residents and 15 medical interns. The nurse respondents were assigned in different units where medical technologists, medical residents and medical interns may be rotated to include the Intensive Care Unit (ICU), Hemodialysis Unit (HD), Operating and Delivery Rooms (OR/DR), and Neonatal Intensive Care Unit (NICU). The data shows significant difference in the three areas: Awareness, Reporting and Management of Injuries;  $F=0.006$ ,  $F=0.03$ ,  $F=0.04$ ,  $p=0.05$  respectively. This suggests that nurses, medical technologists, medical interns and medical residents have differences in their level of awareness. From the conclusion derived from this research, the following recommendations are drawn: There is a need to establish a regular infection control protocol orientation among medical residents to improve their level of awareness as to needle stick injury, reporting and management. Reinforce further BRAVE campaign through other multimedia means like an application in the mobile phones, IEC materials etc. There is need to further investigate locus of control among health care professionals of the medical center.*

**KEYWORDS:** Needle Stick Injury, Healthcare Workers, Occupational Health Hazard, Medical Waste Disposal, Reporting of Injury, Management of Injury, Awareness of Injury



## INTRODUCTION

Healthcare workers have accepted as Bible truth that occupational hazards such as needle stick injuries are “part of the job”. While it is common knowledge and merely dismissed by many, the risks of being pricked can be detrimental not only to the individual but to the nursing profession in general.

The American Nurses Association (ANA) lobbied for the passage of the Needle stick Prevention Act which was signed into law in November 2000 and was enacted in April 2001. As an advocate among nurses of the United States, the ANA conducted a study to inform nurses about the law as well as: identify five key components of the Needle stick Safety and Prevention Act of 2000; discuss the impact of safe practice/safe needle devices on nurses’ health and well-being; explain the key elements of the OSHA Compliance Directive for the Blood borne Pathogens Standard and strategies for identifying and reporting non-compliance; explore proactive strategies for promoting a culture of safety in the workplace and describe ANA activities to promote health and safety in the workplace for nurses (Foley & Leyden, 2000).

In the Philippines, the late Sen. Miriam Defensor-Santiago authored the “Health Care Worker Needle Stick Prevention Act” in 2013, which required the secretaries of health and labor to enact regulations to eliminate or minimize the significant risks of needle stick injuries among health care workers (Senate Bill 931, 16<sup>th</sup> Congress of the Republic of the Philippines).

However, such measures will only be valuable when health care workers themselves are informed about the importance of preventing and reporting needle stick injuries. Hence, this paper was conceptualized to be able to assess the knowledge and practice of health care workers in DLSMC using an innovative approach.

BRAVE is an acronym for **B**leed, **R**inse, **A**nchor, **V**alidate and **E**merge. A two-pronged approach to information dissemination about the importance of reporting as well as an educational material on what to do when one is pricked. This advocacy is currently visible in a variety of medium: desktop screensavers, posters in and around the hospital including the elevators and the out-patient department. Spearheaded by the Infection Control Committee, it seeks to increase the awareness of health care workers in the dangers of non-reporting of such incidents as well as enlighten them on the interventions that are available to them in case, they become a victim of needle stick injury.

### Research Questions

This study was conducted to determine the level of awareness and the extent of difference in the prevention and management of needle prick injury. The following research questions were formulated:

1. What is the level of awareness of the respondents in terms of the risks of infection brought about by a needle prick?
2. What is the level of awareness of the respondents in terms of the awareness in reporting needle stick injuries?



3. What is the level of awareness of the respondents in terms measures to prevent needle stick injuries?
4. Is there a difference in the level of awareness of respondents in the following areas?
  - a. Risk of infection brought about by a needle prick
  - b. Reporting Needle Stick Injuries
  - c. Measures to Prevent Needle stick Injuries

## **REVIEW OF RELATED LITERATURE AND STUDIES**

Needle stick injury (NSI) is an accidental percutaneous piercing wound caused by a contaminated sharps instrument, usually a hollow-bore needle from a syringe, and is one of the most frequent routes of transmission in occupationally acquired blood-borne infections (Phillips, Conaway & Jagger, 2012). More than 20 blood-borne infections may be transmitted by NSI. In the most severe cases, the transmission of human immunodeficiency virus (HIV), hepatitis B virus (HBV), and hepatitis C virus (HCV) may severely impair quality of life and reduce life expectancy, while incurring substantial costs, especially in the long term (Trueman, Taylor, Twena, Chubb, 2008; Leigh, Gillen, Franks, et al., 2007; Solem, Snedecor, Khachatryan, et al., 2014; Poonsapaya, Einodshofer, Kirkham, Glover, DuChane, 2015; Lee, Veenstra, Hoeja, Sullivan, 2004).

The World Health Organization (WHO) recommends the use of safety injection devices and instructs governments to transition to their exclusive use by 2020 (WHO, 2015). The USA, Canada, Brazil, Taiwan, United Kingdom (UK) and European Union (EU) countries have enacted legislation requiring the use of safety injection devices. Despite an increased awareness and legislation in some countries, NSIs and their serious consequences still occur. Since NSIs occur most often during hypodermic injections, a systematic review of literature on NSIs and the active safety engineered devices for hypodermic injections was conducted by Cooke & Stephens in 2017. They found out that although several countries have enacted legislation regarding NSI and safety-engineered devices including the USA, Canada, UK, EU countries, Brazil and Taiwan, and while such legislation has increased the use of safety-engineered devices, even in countries where these devices were available prior to the legislation, voluntary adoption of safety devices without mandated legislation was ineffective in producing a large-scale reduction in NSI rates. A significant 38% drop in hospital NSI rates occurred only after the Needle stick Safety Prevention Act (NSPA) was enacted and safety devices became the predominant technology in healthcare settings. Compliance with mandatory safety engineered device legislation has been high in US hospital settings. However, HCWs in non-hospital settings (i.e., clinics, private offices, long-term care facilities, and free-standing laboratories) account for 60% of the healthcare workforce, but have 25%–35% lower adoption rates of safety-engineered devices than hospitals. In the UK, since the passage of the EU Council Directive 2010/32/EU and the Health and Safety (Sharps Instruments in Healthcare) Regulations of 2013, the majority of National Health Service (NHS) trusts instruct their staff to use safety devices whenever possible. However, one-third of the NHS trusts have failed to implement safe sharps practices. Often, legislation without enforcement has less significant impact on the implementation of safety devices in healthcare



settings. In Brazil, adoption of safety devices has been slower as there are gaps in the monitoring of the adoption of safe practices, mainly related to preventing and controlling occupational accidents (Cooke & Stephens, 2017).

In another study among health care workers in Pakistan in 2016, the authors noted that the level of awareness was correlated to how well it caused them to adopt precautionary measures. It was found that 58 (100 %) laboratory technicians, 65 (91.4 %) doctors and 65 (92.9 %) nurses used gloves for standard procedures but it was found that even though 101 (51%) HCWs knew that the standard method of discarding needles is without recapping, only 39 (19.7 %) disposed needles without recapping. Of these, majority were the nursing staff 22 (31.4 %), lab technicians 10 (17.2 %) and only doctors 7 (10 %). One hundred fifty-nine (80.3 %) HCWs were practicing recapping needles, majority of which were doctors, 63 (39.6 %) and 42 (30.2 %) were lab technicians and nursing staff (Qazi, Siddiqui, Faridi, et al., 2016).

The prevalence of NSIs was 99 (50 %) and out of these, 31 (31.3 %) had experienced an NSI while recapping. Only 24 (24.2 %) people who experienced an NSI were aware enough to take post exposure prophylaxis, a greater number of which were the lab technicians 11 (45.8 %), 7 (29.2 %) nursing staff and 6 (25 %) doctors. It was further evaluated that 177 (89.4%) HCWs were aware that Hepatitis B spreads through needle stick injuries 64 were doctors, 57 nurses and 56 lab technicians. One hundred eighty (90.9 %) HCWs had received at least 1 dose of vaccination against Hepatitis B. The majority, that is 13 (6.6 %), that did not consider Hepatitis B to spread from needle stick injuries was the nursing staff, compared to 6 (3 %) doctors and 2 (1 %) lab technicians. About 27 (15 %) of those who had not completed the vaccination course of 3 doses, majority were also the nursing staff 12 (6.7 %). One hundred fifty-three (77.3 %) HCWs had completed their vaccination course of 3 doses. Around 15 (7.6 %) did not know that Hepatitis C spreads through NSIs. Of these, 10 (66.7 %) were nursing staff and 5 (33.3 %) were doctors. Thirty-eight (19.4 %) HCWs had the perception that the vaccine was against Hepatitis C, of which the majority were the lab technicians 17 (44.7 %), nursing staff 16 (42.1 %) and doctors 5 (13.2 %). 27 (13.6 %) were unaware that HIV spreads through NSIs. Of these, 19 (70.4 %) were from the nursing staff, 6 (22.2 %) lab technicians and 2 (7.4 %) doctors. Of those who had completed their vaccination course, only 64 (41.8 %) ever received a booster dose, out of which 28 (43.8 %) were nurses, 19 (29.7 %) lab technicians and 17 (26.6 %) doctors. Those who had not been vaccinated were further questioned about the reason for not getting vaccinated and it was noted that 13 (72.2 %) were aware but not bothered to receive vaccination (Qazi, Siddiqui, Faridi, et al, 2016).

These results are alarming because while information may be available, health care workers seem to disregard the dangers that such injuries to their health and their families as well. Such mindset must be changed as nurses in particular are also health educators and their inability to gauge the magnitude of dangers NSIs pose will definitely affect their workplace and patient safety in general. About 40-70 % cases of needle stick injuries remain unreported in developing countries, similarly 11 (15.7 %) doctors from the same study thought that a needle stick injury need not be reported and another research showed that doctors especially surgeons were least number in reporting NSIs, which could be most likely because of self-assessment of low risk and likelihood of self-care for injuries (Habib, Khan, Aziz, 2011). It is important to note, therefore, that due to insufficient information retention, knowledge and adherence to taught practice may still be deficient in spite of proper training and education.



Therefore, it is significant to ensure health care workers are not only informed and educated but continuously reminded of their responsibility to report needlestick injuries to be able to prevent it from occurring, minimize the dangers of complications and ultimately improve the patient safety culture in all health care organizations.

## **METHODOLOGY**

This was a study initiated by the Infection Control Committee of De Los Santos Medical Center (DLSMC), a private, 150-bed tertiary hospital based in Quezon City, Philippines. It was conducted to assess awareness of the importance of needle stick injury reporting, its prevention, and its management among healthcare workers in the institution. Among the DLSMC personnel, the identified study participants were nurses, medical technologists, and doctors because of their higher exposure to needles and sharps in patient care areas.

A 10-item survey was formulated to assess awareness on the fundamental elements revolving needle stick injury, which are the risks of infection, importance of reporting, and post-exposure management. Four out of the 10 questions focused on incident reporting, which is a key element in post-exposure management. Three out of the 10 questions were allotted to assess awareness of the risk of needle stick injury in the workplace as well as the risk of a possible infection from the said injury. The remaining three questions evaluate awareness on awareness of the management after injury and preventive measures. The questions were formulated categorically but they were randomly arranged and presented in a 1-page survey form. The name and gender of the participants were not taken into account. Only the profession was noted as well as the date that the surveys were answered.

The study was a descriptive-cross sectional comparative design which has assessed the level of awareness of health care professionals in the medical center. Data were condensed utilizing mean and differences were determined utilizing ANOVA.

### **Presentation, Interpretation and Analysis**

A total of 110 respondents were included in the study with 50 nurses, 15 medical technologists, 15 medical residents and 15 medical interns. The nurse respondents were assigned in different units where medical technologists, medical residents and medical interns may be rotated to include the Intensive Care Unit (ICU), Hemodialysis Unit (HD), Operating and Delivery Rooms (OR/DR), and Neonatal Intensive Care Unit (NICU).

Table 1 shows the total mean scores among nurses, medical technologists, medical interns and medical residents. Among the four health professionals included in the study, the medical interns are extremely aware (3.93) that they are at a risk of needle stick injury compared to the medical residents (3.87), medical technologists (3.80) and nurses (3.78). However, awareness to blood borne pathogens when accidentally pricked and the awareness of the risks of infection among the respondents are slightly comparable given their total means. This suggests that health care professionals in the study are aware of the risks of infection brought about by a needle prick. The awareness may be related to the degree of exposures these professionals may have given their areas of assignments. The occupational hazards associated when caring, extracting and treating, curing or intervening may appear to have an impact in the degree of awareness which these professionals may have acquired during the course of



their duty or dispense of care. A study by Qazi, Siddiqui, Faridi, et al. in 2016 revealed a similar result when they conducted a study on awareness about precautions for needle stick injuries among health workers in Pakistan. The said study was conducted because needle stick injury remains to be one of the occupational hazards encountered by healthcare workers in Pakistan and Hepatitis B and HIV were the most common pathogens being transmitted.

**Table 1: Total Mean Scores Among Nurses, Medical Technologists, Medical Interns and Medical Residents.**

		NURSE	MED TECH	MD INTERN	MD RESIDENTS
<b>Awareness on Needle stick Injury</b>					
1	I am aware that I am at risk of needlestick injury at any given moment while I am on duty.	3.78	3.80	3.93	3.87
6	I am aware of the bloodborne pathogens I can get when I am accidentally pricked with a contaminated needle.	3.72	3.73	3.60	3.73
7	I am aware of the risks of infection from bloodborne pathogens.	3.76	3.73	3.87	3.80

The total mean scores of respondents' awareness with regards to the importance of reporting needle stick injury as summarized in Table 2. It is noteworthy that medical interns and medical technologists have the same total mean score (3.40) in item 9 which corresponds to their awareness to whom to report when they are accidentally pricked with contaminated needles/sharps. This suggests that these professionals were aware of the importance of reporting however the nurse counterparts are extremely aware to whom to report a needle stick. Interestingly, the medical interns who were aware to whom to report were less likely to report when they encounter a needle prick. This suggests a contradictory result from this group of health care professionals considering that there is awareness but the action to reporting is not congruent with the level of awareness. This is comparable to a low percentage (26.9%) of health care workers in Sweden who did not report needle stick injuries even though 80.1% of them knew the reporting protocols (Cooke & Stephens, 2017).

Nurse respondents' total mean scores are the highest with regards to awareness in reporting needle stick injuries (3.88) with medical interns not far behind with a total mean score of 3.87. While medical technologists and medical residents garnered total mean scores of 3.40 and 3.27, respectively. Nurses in the study were more aware of the reporting protocol since there is a part of their orientation. Other health care counterparts appear to have lower awareness scores primarily because of the absence of a formal orientation of IC among these professionals. These scores are significant as Cooke and Stephens (2017) noted several reasons why health care workers fail to report incidents of needle stick injuries.



**Table 2: Total Mean Scores of Respondents' Awareness with Regards to the Importance of Reporting Needle Stick Injury.**

Importance of Reporting		NURSE	MED TECH	MD INTERN	MD RESIDENTS
2	Documentation is necessary in ensuring needlestick injury is managed properly.	3.72	3.73	3.80	3.67
3	I am likely to report any needlestick injury I may encounter.	3.78	3.67	3.40	3.60
8	I am aware that I need to report needlestick injury.	3.88	3.73	3.87	3.73
9	I know who to report to if I accidentally get pricked with contaminated needle/sharps.	3.82	3.40	3.40	3.27

Medical management after a needle stick injury posts several burdens to both the health care worker and the health care institution. Table 3 summarizes the total mean scores of respondents' awareness to the prevention and post-exposure management of needle stick injuries.

Among the respondents, the medical interns are extremely aware of the measures to prevent needle stick injuries (3.87) while nurses got a total mean score of 3.76, 3.67 among medical technologists and 3.47 among medical residents. This suggests that medical interns who are extremely aware of the prevention of needle stick injuries were less likely to report when an actual injury happens. This incongruence further suggests disconnect of the health seeking behavior that medical interns despite their level of awareness of the infection and the prevention would likely not to report an injury. Total mean scores of awareness on first aid management in accidental needle stick injury were highest among medical technologists followed by nurses, 3.67 and 3.58 respectively. This suggests further disconnect of the health seeking behavior in as much as the degree of awareness is very high yet likelihood to report is low.

These results are compatible with Alwabr's (2018) where he found nurses to be more knowledgeable among other health professionals in a tertiary hospital in Bengaluru, India. The same study also found nurses who are knowledgeable are the ones who seek management after exposure to a needle stick injury.



**Table 3: Total Mean Scores of Respondents' Awareness to the Prevention and Post-Exposure Management of Needle Stick Injuries.**

Management	NURSE	MED TECH	MD INTERN	MD RESIDENTS
4 I am aware of the first aid management in accidental needlestick injury.	3.58	3.67	3.47	3.13
5 I am aware of the medical management (laboratory and medications) after a needlestick injury incident.	3.28	3.53	3.40	3.13
10 I am aware of the measures I can apply to prevent needlestick injury.	3.76	3.67	3.87	3.47

**Table 4: Difference in Levels of Awareness in Needle Stick Injuries, Reporting of Injuries and its Management.**

Health Professionals	Awareness of Needle Stick Injuries	Reporting of Injuries	Management of Injuries
RN	F= 0.00684784 p=0.05	F= 0.03319375 p=0.05	F= 0.049536728 p=0.05
Medical Technologist			
Medical Intern			
Medical Residents			

The data shows the difference in the levels of awareness in needle stick injuries, reporting of injuries and its management. It can be deduced from the table that there is a significant difference in the three areas of awareness. (F=0.006, F=0.03, F=0.04, p=0.05) This suggests that nurses, medical technologists, medical interns and medical residents have differences in their level of awareness of needle stick injuries, in reporting injuries and its management. The finding supports the other results of the study as to level of awareness in the three areas reflecting consistent differences in the mean scores obtained from the areas being investigated.

## CONCLUSION

The study has delved into the level of awareness of nurses as to needle prick injury. The following conclusions were derived:

1. The medical interns are extremely aware that they are at a risk of needle stick injury compared to the medical residents, medical technologists and nurses





2. The medical interns and medical technologists have the same awareness level as to reporting of needle prick injury, while nurses have extreme awareness of the protocol of reporting, physicians have slight awareness of the reporting mechanism
3. The medical interns, nurses and medical technologists are extremely aware of the measures to prevent needle stick injuries, while medical residents were slightly aware of the management
4. The nurses, medical technologists, medical interns and medical residents have differences in their awareness of needle stick injuries, in reporting injuries and its management.

## RECOMMENDATIONS

From the conclusion derived from this study, the following recommendations are drawn:

1. There is a need to establish a regular infection control protocol orientation among medical residents to improve their level of awareness as to needle stick injury, reporting and management.
2. Reinforce further BRAVE campaign through other multimedia means like an application in the mobile phones, IEC materials etc.
3. There is a need to further investigate locus of control among health care professionals of the medical center.

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