

EXPLORING KNOWLEDGE ATTITUDES AND PRACTICES REGARDING NEEDLE STICK INJURIES AMONG NURSES IN KARACHI, PAKISTAN

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Abstract

Background: Nurses are particularly vulnerable to needle stick injuries (NSIs), which can spread blood-borne illnesses like HIV, Hepatitis B, and Hepatitis C. In addition to endangering healthcare professionals' physical and mental wellbeing, these injuries also affect patient safety. The purpose of this study is to evaluate NSI prevalence, causes, and awareness in order to encourage a safety-conscious culture in healthcare settings. **Objective:** To evaluate nurses' knowledge, attitudes, and practices around needle stick injuries in tertiary care hospitals. **Methods:** A cross-sectional study was conducted among 100 nurses working in tertiary care hospitals of Karachi using a pretested questionnaire on needle stick injuries. Informed written consent was obtained, aiming to assess nurses' knowledge and practices regarding NSIs. **Results:** This study shows only 47.8% of participants received training on preventing needlestick injuries, and 54.3% were not aware of hospital waste disposal rules. Furthermore, a needlestick injury occurred in 32.6% of cases, primarily as a result of personal negligence (34.8%) and inadequate needle disposal (17.4%). **Conclusion:** Study highlights serious shortcomings in nurses' NSI-related practices, urging stronger institutional support, rigorous policy enforcement, and better training to guarantee workplace safety.

Keywords: Needle Stick Injuries, Nurses, HIV, Hepatitis, Training

Introduction:

Needle stick injury (NSI) refers to the literal introduction of blood or other potentially hazardous material into the body of a healthcare worker while performing their duties using a hollow bore needle or sharp instruments such as needles, lancets, scalpels, and contaminated broken glass. Needle stick injury (NSI) means the par literal introduction of blood or other potentially hazardous material by a hollow bore needle or sharp instruments in the body, including, but not limited to, needles, lancets, scalpels, and contaminated broken glass. According to the World Health Organization, "a safe injection" is one that does not cause harm to the receiver, poses no preventable risk to the provider, and produces no waste that poses a risk to the public. In developing nations, hazardous and illogical injection procedures are common. Effective safety procedures and the use of safety devices can prevent over 80% of needle stick injuries. As a safety measure, "universal precautions" can be used to prevent needle

stick injuries ^[1]. Health care personnel are particularly vulnerable to needle stick injuries (NSI), which are often the cause of blood-borne illness transmission. According to estimates, 50% of the injections given in underdeveloped nations are dangerous for the patient and the medical professional. The two main diseases that can spread through infected needles in Pakistan are hepatitis B and C. The likelihood of contracting hepatitis B after being pricked by contaminated equipment or a contaminated needle is 20–40%. The high frequency of needle stick injuries—which can range from 35% in Egypt to up to 58% in Pakistan—makes the problem concerning on a global scale.

According to studies, nurses are the healthcare professionals who get needle stick injuries the most frequently. The most frequent reasons for injuries in hospital wards are phlebotomy and intravenous infusions ^[2]. A high patient-to-healthcare worker ratio (WHO 1998, 2001; Ugandan Ministry of Health, Resource Center 2003) and a lack of safe devices in hospitals due to low spending on occupational safety and health services and health care (Ugandan Ministry of Health, Resource Center 2003) create a work environment that puts healthcare workers at high risk for needle stick injuries and, ultimately, blood-borne infections ^[3]. Health care workers and their loved ones may experience significant health repercussions and psychological stress as a result of occupational exposures to percutaneous injuries, which are a significant source of blood-borne pathogen infections. There have been reports of over 50 different infections being spread by blood at work. NSSIs raise the possibility that illnesses like HIV, Hepatitis B, and Hepatitis C will spread ^[4].

The high frequency of needle stick injuries among nurses in clinical settings and its grave consequences prompted this study. These accidents provide a risk of contracting potentially fatal blood-borne illnesses like HIV (AIDS), Hepatitis B, and Hepatitis C, making them more than just workplace dangers. In addition to endangering the health and wellbeing of healthcare professionals, these illnesses carry a high risk of spreading to the patients they are responsible for. Because nurses are on the front lines of patient care, their safety is crucial to sustaining high-quality healthcare delivery. Affected nurses may experience long-term mental and physical repercussions as well as a diminished ability to deliver quality care. Consequently, it is very important for public health as well as the nursing profession. It seeks to fill important knowledge gaps and advance a safety culture by assessing the prevalence, causes, and awareness of needle stick injuries. By raising awareness and following basic procedures, nurses may better safeguard themselves and their patients, which will ultimately make healthcare environments safer and more robust.

Literature review

Nurses continue to be at risk of contracting infections or blood-borne illnesses from needle stick accidents. It is the most frequent injury that exposes people to bodily fluids that are contagious. According to the study's findings, 13% of people experienced one or more new needle stick injuries each month, which is a relatively high rate among nurses. Based on these 30-day estimates, there were roughly three needle stick injury cases per day in the sample. Compared to doctors, nurses are more likely to be around needles, which are used for administering and infusing various medications. Additionally, as hospital workloads are heavier in the morning, a higher number of injuries among morning workers points to the same cause ^[2]. According to a different study, needle stick injuries among nurses occur often. Their investigation found that the biggest risk factor for needle stick injuries was a lack of training. Long work hours and elements of work practices (such as recapping and not wearing gloves) were included in other risk variables. According to this study, organizing adequate training on needle stick injuries could greatly lower the number of needle stick injuries in many nations. Future studies should look into the most effective training methods ^[3]. 23.5% of hospital nurses had experienced a needle stick in the past, according to another research. Nurses working in

various wards and hospitals have a wide range of knowledge and expertise. Of those who had injuries from needle sticks and sharp objects, only 30.9% reported the incident. This study also shows that in order to facilitate and make suitable counseling, prophylactic measures, or early treatment, it is necessary to report cases of needle stick injuries to the relevant authorities ^[4]. Within hours of the incident, any healthcare worker who sustains a needle stick injury should get in touch with post-exposure prophylaxis (PEP), if applicable. They require follow-up, counseling, and confidential testing. Post-exposure management, including PEP for HIV and hepatitis B virus, as well as assessment of work-related risks and preventive actions, may be negotiated by those who neglect to notify the proper authorities of needle stick injuries ^[5]. Employers must create a safe workplace with valuable safety programs and safe needle devices to prevent needle injuries among healthcare workers. Employers must put in place a program to reduce needle stick injuries and engage employees in it ^[6]. According to the NAO's assessment and the HSE's confirmation, one of the main issues with managing needle stick events is the dearth of concrete data regarding the true number of incidents in trusts. This is a result of exposure incidents being underreported, which some studies have found to be as high as 85%. One important area that needs more effort is data collecting and record keeping, along with the monitoring of those records, according to the NAO ^[7]. Nurses and other healthcare professionals are frequently exposed to dangerous and deadly illnesses as a result of needlestick injuries. To avoid needlestick injuries and the devastating outcomes, all parties involved must work together more ^[8]. NSIs can be as severe as other psychiatric trauma and lead to long-lasting mental disorder. The length of depression linked to needle stick injuries may be shortened by prompt test result delivery. Occupational health practitioners must understand the psychological and physical consequences of needlestick injuries ^[9]. Additionally, the study demonstrated that while education and training alone can result in a slight decrease in NSI, this decrease is not maintained in the absence of safety-engineered devices. Only after adding safety-engineered items to improve education did there be a significant and long-lasting decrease in NSI ^[10].

Methodology

This cross-sectional study was carried out among nurses at tertiary care Hospitals of Karachi. The sample size was 100 nurses, who are currently employed in these hospitals. A well-designed and pretested questionnaire about needle stick injuries was used to collect data. Before the interview, each participant gave their informed written consent. The purpose of the study was to evaluate nursing practitioners' behaviors and understanding of needle stick injuries. SPSS version 22.0 was used to analyze the collected data. Throughout the investigation, ethical considerations were maintained.

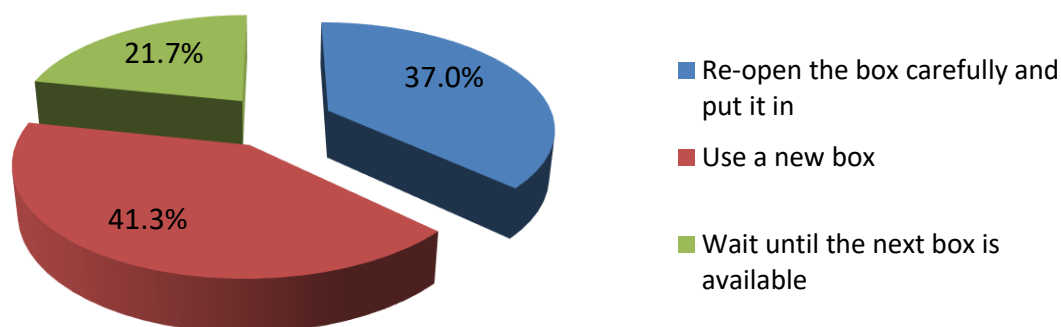
Results

There were 84.8% registered nurses and 8.7% aid nurses among the 100 participants, with the remaining nurses being graduates. The fact that there were only three 6.5% graduates indicates that Pakistan has an extremely low graduate nursing ratio. In addition to their many other duties, nurses are also responsible for administering medication in any form, whether intramuscularly or parenterally. This makes it clear that nurses are responsible for administering injections; 45 participants 97.8% indicated that they had done so, while the remaining 1 participant 2.2% did not. Only 5 (10.9%) respondents said they did not need help removing or disposing of the needle, while the remaining 41 (89.1%) said they did. It indicates that 10.9% of our participants disposed of their needles on their own, which increases the risk of needle stick injuries, and the remaining 89.1% of participants did not do so. Figure 3 shows this. The majority of nurses don't practice universal precaution, and others don't even know what it is. Unfortunately, some of our nurses were unaware of this safety precaution, which does not resheath the needle. by inquiring as to whether or not the participants resheath the

needle after use. 24 (52.2%) of the participants said that they do not resheath the needles after giving an injection, whereas 22 (47.8%) of the participants said that they do.

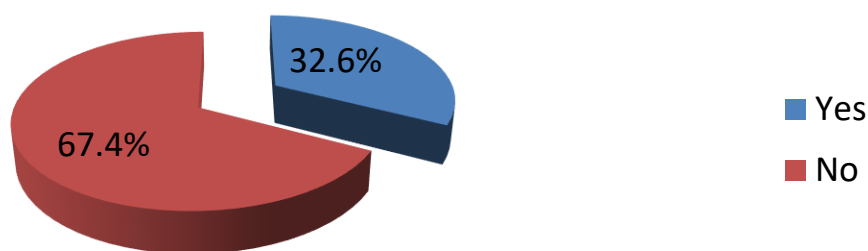
The participants were asked how they would react if they had to unplug a syringe from a needle. Of the participants, 14 (30.4%) said they would separate the needle from a syringe with their bare hands, but they would need to be very careful. Seven (15.2%) said they would never separate, while 17 (37%) said they would do so with gloved hands and 8 (17.2%) said they would use forceps. Needlestick injuries are also very common, and nurses are particularly vulnerable. While disposing of a sharps box, there are numerous risks of needle stick injuries. Additionally, there is a probability that they will either wait to finish the box or dispose of only half of it. In response to our survey, 22 participants (47.8%) said they wait until the box is about $\frac{3}{4}$ full, 18 participants (30.1%) said they wait until the box is fully full, 5 participants (10.9%) said they wait until the box is $\frac{2}{3}$ full, and only 1 participant (2.2%) said they wait until the box is $\frac{3}{4}$ full.

What would you do if you find a used needle on the floor after you have closed the sharps box



It means that in this study very less percent of participants following the guidelines for the disposal of sharp box. There are some guidelines for the disposal of sharp box according to Environmental Health and Radiation Safety (EHRS) "Sharp container must not be filled greater than $\frac{2}{3}$ [11]. After assessing this it is compulsory to ask that what did they do with a sharp box prior to disposal? On asking these 12 (26.1%) participants replied that we need to ensure that the box is secure and correctly assembled. 10 (21.7%) of the participants answer this question that to put it in a yellow bag, 9 (19.6%) of the participants forced on its labeling they answer that sharp box need to be properly labeled prior the disposal, 7 (15.2%) participants replied that we need to wait until the next box is available. 4 (8.7%) participants replied that we need to locked it up until it is collected, while 4 (8.7%) participants replied that we will do nothing with the sharp box. All the participants were asked that if you find a used needle on the floor after you have closed the sharp box what would you do, 19 (41.3%) replied that they will use a new box, 17 (37.0%) replied that they will Re-open the box carefully and put the needle in it, 10 (21.7%) replied that they will wait until the next box will be available.

Have you sustained a needle stick injury during the last 12 months?



By asking another question from the participants that have you ever sustained a needle stick injury during the last 12 months. 31 (67.4%) replied that they did not experience any injury while the remaining 15 (32.6%) participants replied that they have experienced needle stick injury. After that the participants who experienced needle stick injury were asked that how many injuries occur. In those 15 participants the 6 (13%) replied that 2 times or less than 2, while 4 (8.7%) replied 3 to 4 times in which some have experienced 3 injuries and some experienced 4 injuries, the remaining 5 (10.9%) replied that they have experienced 5 or more than 5 injuries. The participants were asked how most of the recent accidents occur. All participants shared their own ideas in which 8 (17.4%) told that most of the recent incident occur due to poor disposal of needle, while 16 (34.8%) told that most of the incident occur due to individual carelessness. 22 (47.8%) participants replied that they did not remember. To assess that after injury they report to whom in Health care member, we ask that to whom did you report the injury if occurred. 16 (34.8%) replied that they did not report any incident or injury while 12 (26.1%) replied that they did not remember that they report to whom. 8 (17.4%) replied that they report to their line manager while 7 (15.2%) told that they report to infection control program regarding injury or incident and only 3 (6.5%) told that they report to the Occupational Health Manager. The respondents were asked that did they fill any incident form, 13 (28.3%) replied with YES, while 29 (63.0%) replied with NO and only 4 (8.7%) replied that they did not remember. Unavailability of the sharp box is directly proportional to Needle stick injury, therefore for assessing this the respondents were asked that was there a sharp box in the department where the incident occur. The respondents replied differently 24 (52.2%) replied with yes, its mean that most department have the facility of sharp box and 16 (34.8%) replied with no that's means that they have no sharp box in their department while 6 (13%) participants did not remember that either there was a sharp box or not they were not sure about the presence of Sharp box.

In this study the participants were asked about the department that either they are working in radiological department, CT scan room, Ultra sound room, interventional room, MRI room, Screening room or other wards such as medical ward, surgical ward, pediatric ward, NICU, CCU, ICU etc. The respondent replied but most of the nursing staffs selected for the study were from wards. 41 (89.1%) participants were providing care in the ward while the remaining 5 (10.9%) participants were working in the Interventional room. Needle stick injury is a common problem among nurses therefore for assessing the risk of injury due to duty timing the respondents were asked that when was the injury sustained. 24 (52.2%) participants replied that it occurs in the morning evening duty timing because of the more work load while 3 (6.5%) replied that it occurs in the weekend. 19 (41.3%) replied that they did not remember the timing of the injury occurred.

The respondent was asked that what's you're thinking about incident report either it's may be only due to used syringe or unused syringe. 24 (52.2%) replied that both used and unused

needle stick injury should report, 8 (17.4%) only focused on used needle while 8 (17.4%) told that incident report should be made if the injury occurs due to used or unused needle stick injury, 6 (13%) showing that there is another reason behind Needle stick injury. Hepatitis is a communicable disease and it can transmit from one person to another. Needle stick injury is the main cause behind the hepatitis B in Health Care provider ^[1]. The respondents were asked about inoculation of Hepatitis B. 26 (56.5%) replied that they are fully inoculated against Hepatitis B, 11 (23.9%) respondents said that they are not inoculated against Hepatitis B while 9 (19.6%) were not sure that either they are inoculated or not against hepatitis B. Health care members have very less knowledge about Needle stick injury, its prevention and guidelines for its prevention, therefore we need to assess that had they ever received training on the prevention and treatment of needle stick injury. In our participants 22 (47.8%) were receive training while 24 (52.2%) were not trained about the prevention and treatment of Needle stick injury which is shown in Figure 19. The participants who are trained in the prevention and treatment they were asked that from where they get trained and how long ago were they trained. The most important thing for the health care worker is the Health and Safety policy on the safe and ethical disposal of clinical waste, if the health care worker read the policy, then he or she will be able to dispose the clinical waste in a safe way and he or she will be able to prevent himself or herself from the needle stick injury therefore the respondents were asked that either did they read the hospital policy on safe and ethical disposal of waste. 21 (45.7%) replied that they read it while the remaining 25 (54.3%) replied that they did not read it.

Discussion

This study offers important new information on nurses' attitudes, practices, and understanding about managing and preventing needle stick injuries (NSIs). The results point to a number of critical issues that require quick action in order to enhance workplace safety and adherence to universal measures in the healthcare environment. The sample was primarily made up of registered nurses (84.8%), with a concerning low percentage of graduate nurses (6.5%) and a smaller percentage of aid nurses (8.7%). This low percentage of graduate-level nurse's points to a deficiency in Pakistan's advanced nursing education, which could have an immediate impact on people's awareness of and compliance with safety procedures.

A sizable portion of participants (97.8%) attested to the fact that they gave injections as part of their regular responsibilities, demonstrating the substantial risk of NSI exposure. It is concerning to note that 10.9% of nurses reported throwing away needles on their own, which raises the risk of harm. Additionally, 47.8% of the participants reported waiting until the sharps box was full before disposing of the needles, which is contrary to the Environmental Health and Radiation Safety (EHRS) guideline that advises disposing of the sharps container once it is two-thirds full. This highlights the inappropriate disposal of needles. With 47.8% of participants confessing to resheathing needles a practice discouraged because of the elevated risk of NSIs resheathing procedures were another area of concern. Additionally, almost one-third (30.4%) said they used their bare hands to remove needles from syringes, which suggests that basic safety precautions were not being followed. Just 26.1% of respondents made sure the sharps box was secure before discarding it, whilst 19.6% of respondents were more concerned with labeling or 15.2% were just waiting for a new box. Unsettlingly, 8.7% said they did nothing, indicating a risky disregard for disposal procedures. 32.6% of the individuals had experienced an NSI in the previous 12 months. 10.9% of those impacted had five or more injuries, underscoring the prevalence of exposure and the dearth of preventative measures. The majority of injuries were ascribed to either inappropriate disposal procedures (17.4%) or personal negligence (34.8%). A potential underestimating or underreporting of such instances may be indicated by the fact that nearly half (47.8%) of the respondents were unable to recall the reason for their injuries.

Additionally, the reporting culture was not at its best. Just 6.5% of wounded participants told the occupational health manager about the occurrence, and only 17.4% reported it to infection control staff. The majority of subjects either forgot (26.1%) or did not report the injury (34.8%). Similarly, just 28.3% of respondents filled out an incident form, indicating that NSI documentation is not regularly used or prioritized. In departments, sharps boxes were not always available. Of the participants, 52.2% affirmed that they were present, 34.8% said they were not, and 13% were not sure. Lack of this necessary equipment is directly linked to higher NSI risks, highlighting the necessity of regular disposal tool availability.

The majority of nurses (89.1%) worked in general wards, where regular injections and procedures may have increased exposure. There may be a connection between increased workload and injury risk, as the majority of NSIs (52.2%) were recorded during morning or evening shifts. There was also variation in knowledge regarding NSI reporting. Others lacked comprehension, with 13% attributing injuries to unidentified causes, despite 52.2% of respondents believing that both used and unused needle injuries should be recorded. This emphasizes how urgently staff training and clear reporting rules are needed. Only 56.5% of participants had received all recommended doses of the hepatitis B vaccine, putting a sizable section of the workforce at risk. Furthermore, 52.2% of participants reported never having received instruction on managing and preventing NSIs. To make matters worse, just 45.7% of respondents had read the hospital's clinical waste disposal health and safety policy, indicating a lack of institutional focus on safety education.

Conclusion

This study identifies significant gaps in nurses' safety compliance, knowledge, and practices around NSIs. The results highlight the necessity of consistent and thorough training, stringent adherence to safety procedures, adequate equipment availability, and a strong reporting system. To safeguard nurses and enhance workplace safety, these concerns must be addressed through institutional support, policy change, and continual professional development.

Recommendation

It is crucial to raise awareness of hospital safety procedures, guarantee that all medical personnel have received the full hepatitis B vaccination, and encourage a culture of incident reporting. To further reduce the risk of injuries and improve general safety procedures, continuous training and supervision should be offered, particularly in high-risk departments.

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