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Review Article

Occupational Exposure to Sharp Instrument Injuries Among Registered Nurses in Public and Private Hospitals of Lahore Pakistan

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ABSTRACT

The purpose of this literature review and analysis report is to expose occupational exposure to sharp instrument injuries among registered nurses in public and private hospitals of Lahore Pakistan and associated factors related to sharp instrument injuries among nurses in public and private hospitals of Lahore Pakistan. Nurses are exposed to various risk factors and risky Behaviour that may seriously affect their health and ability to work. Despite recent technological advances such as safety-engineered devices (SEDs), these injuries continue to occur in healthcare facilities worldwide. The searches were restricted to papers published from 2015 to the present, those written in English, and those using the keywords exposure, hospital, doctor, nurse, and sharp injuries or needle stick injuries.

INTRODUCTION

Sharp injuries are life-threatening among registered nurses in health care setting. Sharp injuries widely distributed blood -borne pathogens among individuals such as patient to nurses [1]. Sharp injuries include unintentional skin piercings, injuries from intravenous and blood-attach needles, catheter stylet injuries, and injuries from needles used to connect delivery system components. Sharp injuries are the most frequent work-related accidents among healthcare professionals. In hospitals, these wounds might occasionally occur during any surgery [2, 3]. It is the highest joint professional loss amongst health care providers. Such injuries did not occur in Pakistan but it also occurs globally. Worldwide many cases were reported due to sharp injuries such as 66000 Hepatitis B, 16000 Hepatitis C, and 1000 cases occurred due to sharp injuries in 2000. According to one estimation, 600,000 to 800,000 occurred in the USA per annum. The first case of sharp injury was reported of HIV in 1984. And this case signifies the risk of sharp injury among healthcare providers [4]. Healthcare professionals (HCWs) around the world run the danger of coming into contact with blood-borne infections while on the job due to exposure to human blood and other bodily fluids [5]. Medical students are particularly at risk because they lack clinical experience, and sharp injury prevalence typically occurs in hospital settings [6]. It is estimated that 1: 10 health care worker suffers from sharp injury per year. The core reason for using polluted blood-borne pathogen devices [2]. Although HIV risk is low as compared to Hepatitis B and Hepatitis C. Other infections which may be transmitted by sharp injury are syphilis, malaria and herpes [7]. It is predictable that healthcare workers face over 3 million of sharp injuries

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each year. Moreover, about 66,000 Hepatitis B infections, 16,000 Hepatitis C infections, and 1000 suffer from HIV. One report of WHO states that approximately three million health care providers face occupational exposure every year. Furthermore, It is predictable that among these healthcare workers 2 million suffered from Hepatitis B virus, 900,000 from Hepatitis C virus, and 300,000 to HIV. Sharp injury is considered the second commonest source of professional injury in National Health Service. Job-related exposure to blood –borne pathogen due to sharp injuries is serious challenge in health care owing to high unpredicted incidence and significance of the infection that can arise among Health care staffs [8]. In developing countries, highest prevalence of sharp injuries due to limited resources for prevention. It is about 10.1% as compared to developed nations 7.6%. And such injuries could not be monitored due to poor health care system. It means the developed nations need more consideration to overwhelmed it [9]. Although, there is low risk of spreading blood borne pathogen due to single prick. But it can destroy the future of health care worker due to its consequences. In case of infection its effects remains long lasting. It can stop the training and carrier of medical professionals [6]. Blood borne pathogen can also be transmitted infection through eyes, nose, mouth and fragmented skin. Each day, thousands of healthcare professionals worldwide may be exposed to blood-borne pathogens [10]. All medical professionals who use sharp instruments during hostile procedures run the risk of becoming hurt. By using sharp equipment on patients, surgeons in training have the highest risk of exposure to blood-borne pathogens. Additionally, the probability of a sharp injury among surgeons increased as they picked up new technical skills [11]. Additionally, like surgeons Nursing students are also on greatest risk for having sharp injury due to imperfect clinical practice, underdeveloped clinical experience and insufficient attention towards personal safety and in adequate guidelines towards seniors. Nursing students wants to learn new clinical procedures [12]. Although, it is common among health care provider to be exposed to blood –borne pathogen in hospitals. As they provide treatment and involve in care. The performing procedure of health care personnel is an important risk group specifically in relations of certain blood borne communicable diseases [13]. Some studies on sharp injuries report that among the healthcare personnel, nurses are the most vulnerable ones to injuries [14]. Numerous studies indicate that depending on the study location, such as teaching institutions, hospitals, or corporate settings, the prevalence of sharp injuries and the risk factors linked with them change across various HCW groups, such as doctors and nurses. In underdeveloped nations, occupational exposures are frequent, and (40–75) percent of injuries are thought to be unreported [3]. Exposure at work has the potential to have a harmful impact on a worker's health, either away or over time. A needle or other sharp object cutting into the skin with a sharp injury is known as a needle stick injury and poses a risk to patient bodily fluids. Despite advances in the understanding and management of infections, exposure to blood and bodily fluids at work and needle stick injuries remain to be major global public health concerns, raising critical questions for 35 million healthcare workers worldwide. Over 20 million healthcare workers are affected each year by biological, chemical, and mechanical dangers [15]. If healthcare professionals adopt a comprehensive programmed that addresses institutional, behavioral, and device-related factors that contribute to the occurrence of sharp injuries in healthcare workers, then it may be said that these injuries are preventable. According to a study, health care workers had the highest frequency of sharp injuries, and age, education level, the number of shifts worked per month, and a history of related injuries were all associated. Preparing instruments, administering injections, and recapping used needles were the three activities where sharp injuries occurred most frequently. Doctors, nurses, and other HCW who have come into contact with patient blood or bodily fluids frequently suffer from long-term illness and even pass away from sharp injuries. Therefore, it is necessary to determine the severity and scope of the condition as well as any contributing factors that connect to sharp injury [16]. All medical professionals who perform invasive procedures with sharp instruments run the risk of becoming hurt. The operating room poses the biggest hazards, though. By using sharp instruments on patients and increasing the risk of damage while acquiring new technical skills, surgeons in training have the highest risk of exposure to blood-borne pathogens [11]. Exposure at work has the potential to have a harmful impact on a worker's health, either away or over time. When a needle or other sharp object pierces into the skin with sharp injury, patient bodily fluids are at risk. Even though we now understand and can control infections, 35 million healthcare professionals worldwide are seriously concerned about occupational exposure to blood and bodily fluids and needle stick injuries, which remain to be major global public health issues [15]. If healthcare professionals adopt a comprehensive program that addresses institutional, behavioral, and device-related factors that contribute to the prevalence of needle stick injuries in healthcare workers, sharp injuries can be seen as preventable [16]. The study's objective was to evaluate registered nurses' occupational exposure to injuries caused by sharp instruments in both public and private

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institutions. to evaluate the contributing factors that lead to sharp injuries in both public and private hospitals among registered nurses. Registered nurses working in both public and commercial hospitals are vulnerable to suffering severe injuries. The medical staff may experience major problems as a result of such injuries. Therefore, the current study looks into the risk of registered nurses suffering from sharp injuries. The medical staff will therefore benefit from this study in terms of preventing sharp injuries. This study will also offer advice on general precautions and behavior connected to health. The digital library of the university of health sciences' e-journals was used to search the literature. Pub Med, Medline, Science Direct, and Google Scholar searches were used to find the articles that were included in this review of the literature. The searches were restricted to papers published from 2015 to the present, those written in English, and those using the keywords exposure, hospital, doctor, nurse, and sharp injuries or needle stick injuries. Studies that had a strong emphasis on medical and nursing students were disregarded. After 50 publications were read and 20 were included in this review of the literature, the electronic database was searched. The literature that was excluded from this review was chosen based on its applicability to the research. Search results from multiple studies are divided in to two sections. Sharp injuries in developed countries. Sharp injuries in developing countries. Factories associated with sharp injuries. Sharp injuries in developed countries.

SHARP INJURIES

There has been significant decreased ratio of sharp injuries in developed countries. An expected 600,000 to 800,000 needle stick and other percutaneous injuries are reported every year between U.S health care personnel. These injuries due to significant health magnitudes and psychological pressure for health care worker and their beloved ones. It was due to unsafe injection practices on demand; recycle of sterile needles, when purchase is low and unsuitable disposal of dangerous waste [17]. Another cross-sectional study carried out in North West Ethiopia in 2017 by Dilie et al. found that the prevalence of needle sticks and other sharp injuries is low in comparison to earlier studies. This study found that during a year, 18.7% of needle sticks and sharp injuries happened. Needle recapping and work-related stress were responsible for 21.3% and 7.3 times more needle sticks and other sharp injuries, respectively. According to this study, participants who adhere to general safety precautions and master the necessary competence had 99% and 96% decreased risk of suffering a needle stick or other sharp injury, respectively [16]. A study conducted in Washington by Makary *et al*, 2018 shows that surgeon in training were high risk for needle stick injury, According to this study,83% surgeons had got a needle stick injury in their training, 53% injuries were connected with high risk patient.51 % injuries were not reported due to shortage of time. These persons were physicians. This article concludes that improved prevention and reporting behavior needed to be improved for professional safety among surgeons and other trainees [11]. A similar study of Australian university, 2017 highlighted that needle stick injury usually occur in medical students due to lack of clinical practice. Another study conducted in Susan E Mackinnon by M Hasak etal,2018 . The results of this study demonstrate a 100% rise in the prevalence of needle sticks from medical students to residents and fellows. The response rate for needle stick injuries in this study was 38.7%, with 11% of those being high risk. Sharp injuries were most frequently caused by carelessness [18]. According to a Turkish study of 201 nurses, 44.3% of nurses have been hurt by needles or sharp objects at work. Injection needles (35.6%), granules (5.5%), and suture needles (3.1%) were the three most frequent sources of injury. The majority of accidents happened when nurses recapped used needles, disassembled equipment, or tried to remove a needle from rubber or another tough substance. Despite this, 74.6% of nurses use gloves and safety eyewear. According to this study, staff should implement universal infection control procedures, focus on work practices, disposal systems, and education techniques to prevent such injuries [19]. A systematic review and meta-analysis was done in Iran by Gheshlagh R1 etal, 2018.This analysis indicates, that the prevalence of NSIs among health care worker in Iran was 42.5%.It was higher in woman 47% as compared to men 42% [20]. A cross sectional study of Alexandria university on safe injection procedures by Foda Mohamed etal, 2016 shows that there is a high prevalence of needle stick injuries which is 61.3% and these injuries mostly occur due to suture needles 50.8%.Furthermore 66.2% injuries occur due to original use of infected sharp items. The ratio of contaminated injuries 80% with standard precaution. This study indicates that there is high prevalence of needle stick injuries due to insufficient follow the safe injection practices and poor injection practices [21]. A review of occupational exposure to blood and blood products in South African university, 2016 conducted that indicate that medical students are at risk of occupational exposure. For the prevention of needle stick injury, it is essential for provision of harmless needles and instruments, mandatory training programs on novice procedures for using sharp article safely, follow the safety fundamental procedure, strengthen the practical ability of health care workers and there should be more focus on reporting, developing professional skill refrain needle recapping for lessened the

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prevalence of needle stick injuries and therefore decreased the possible hazard of spread of Blood-borne pathogen [7]. An Indian research conducted by Goel et al, 2018 indicates that the incidence of needle stick and sharp injuries is extreme recurrently come crosswise in emergency wards. Anti-HBs titers were substandard in numerous of the HCWs an essential supplementary dose of vaccine of Hepatitis B immunization [3]. A study performed in Tanzania by Mashoto etal highlighted that nearly half of the health care worker had at least experienced at least one job-related injury in the past twelve month. This study focus on health education on professional exposure may strong health providers practice to manage occupational exposure [22]. A cross-sectional study conducted in Tehran, Iran between HCP in Milad hospital shows that 34.3%male and 65.7% female had encountered needle stick injury over a five year period. Many of needle stick injuries occurred in registered Nurses, Nursing sisters and midwifes. These injuries equally occurred in all shifts. Hence least injuries occurred in the start of duty shift, as compared to evening and night shift. The study stressed on protective measures, proper disposal of waste material and hepatitis B vaccination for the decrease of such injuries [7]. a retrospective investigation on HIV or HBV PEP administered to HCWs between 2004 and 2016 in a tertiary hospital in North-Western Nigeria. This study shows that 115 healthcare workers were available overall for PEP during the study period. The largest unprotected group (40/115; 34.8%) were medical students. There were 86/115 (74.8%) exposures to needle sticks. While 53/115 (46.1%) of the exposure sources had HIV, only 9/115 (7.23%) had HBV. Between those who got either one or both HIV and HBV PEP and completed PEP treatment, there was no seroconversion [8]. Hence, a cross-sectional study of Australian university shows that Twenty-five students constant an overall of 28 Needle stick injury incidents in the Previous 12months percentage 16.6% 10.9% prevalence thickness 1.5/100 person-month) 13/25 did not report their Needle stick injury. Students of senior in study were connected with greater rate of Needle stick injury (p = 0.02). Experimental and health colleges' essential speech poor Needle stick injury related Information, increase approaches to reportage and deliver Guidelines on harmless management of sharps. Investigation of Needle stick injury precisely for medical students will offer significant evidence to decrease injury [6].

CONCLUSIONS

The occupational exposure to sharps instrument injuries was high in developing countries among nurses as related to earlier studies. Occupational exposure to sharps instrument injuries are more shared between nurses in public and private hospitals. Such wounds raise the hazard of emerging numerous blood-borne communicable diseases; these injuries are more common among nurses in public and private hospitals due to limited clinical skill. Therefore, the relevant institutions should implement an active reporting system and suitable instruction on professional safety. Additionally, it's critical to address the contributing elements that lead to nursing sharp injury incidents. And give advice on how to avoid similar injuries in the future. The most significant factors that contributed to sharp injury were recapping used needles, sleep disruption, and stress from the workplace.

Conflicts of Interest

The authors declare no conflict of interest

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