



EXPERIENCE OF A HEALTHCARE PROVIDER EXPOSED TO OCCUPATIONAL HEALTH HAZARD: A CASE STUDY

¹Jerobel Q. Aninao

¹Infection Control Nurse
Tagum City, Davao del Norte

Abstract : This qualitative case study examined the lived experiences of two healthcare workers exposed to occupational health risks, specifically needlestick injuries (NSIs). Through in-depth interviews and thematic analysis, three primary themes emerged: Uncertainty and Psychological Impact, Workplace System and Safety and Seeking and Utilizing Support and Response. Both participants experienced emotional distress, fear of infection, and psychological confusion following exposure. Despite using various coping mechanisms, such as internal emotional control or active involvement in support systems, they both demonstrated the importance of psychological resilience. The findings show that both individual (like perceived risk and coping style) and institutional (like reporting systems, safety protocols, and support networks) factors affect healthcare workers' post-exposure reactions. Shared experiences of emotional self-regulation underscore the need for comprehensive occupational health programs that integrate physical safety measures with mental health support. Among the recommendations are psychological first aid, simulation-based training, balanced staffing policies, non-punitive reporting practices, routine vaccination screenings, and ongoing research. Fostering a supportive organizational culture prioritizing safety and mental health can help healthcare providers better manage occupational risks and recover from exposure incidents.

Keywords: Health, Occupational Health Hazard, Qualitative Case Study, Tagum City Norte.

I. INTRODUCTION

Healthcare workers (HCWs) are at constant risk of occupational injuries, particularly needle stick injuries (NSIs), which expose them to bloodborne pathogens such as HIV, hepatitis B (HBV), and hepatitis C (HCV) (Govender, N. (2023). In two alarming cases, allied health professionals experienced a NSI while drawing blood from a person living with Sexually Transmitted Infections (STIs). Despite following standard precautions, a minor lapse led to the needle penetrating their skin, triggering immediate emotional distress and anxiety. The incident necessitated wound cleaning, incident reporting, and post-exposure medical management, subjecting the professional to stigma, professional uncertainty, and potential long-term health complications. This case highlights the persistent vulnerability of healthcare workers to NSIs despite the implementation of safety protocols, underscoring the urgent need for better preventive measures and support systems.

Occupational hazards, including NSIs, are prevalent worldwide and present significant challenges for healthcare workers. The World Health Organization (WHO) estimates that unsafe injections contribute to 39%, 37%, and 4.4% of hepatitis C, hepatitis B, and HIV infections, respectively (WHO, 2021). Globally, more than two million healthcare workers annually experience sharp injuries, resulting in exposure to bloodborne pathogens, with a significant majority occurring in low- and middle-income countries (Bouya et al., 2020). In developed regions, such as the United States and Europe, NSI cases surpass 385,000 and one million annually, respectively, as reported by the Centers for Disease Control and Prevention (CDC) and the European Agency for Safety and Health at Work (EU-OSHA). These statistics emphasize the magnitude of the problem, making NSIs a critical occupational health issue worldwide.

In the Philippines, healthcare workers confront a variety of occupational hazards, including biological risks from needle stick injuries. According to the Department of Health's Online National Electronic Injury Surveillance System (ONEISS), over 72,000 work-related sharps injuries were recorded between 2010 and 2020 (Department of Health, 2020). The situation is exacerbated by systemic challenges such as inadequate access to post-exposure prophylaxis, underreporting of incidents, and limited awareness of safety protocols. Locally, cities like Davao face similar challenges, with healthcare workers in hospitals and laboratories often exposed to sharps and other biological hazards. However, there is limited research exploring these occupational health risks in specific local contexts, leaving gaps in policy implementation and tailored interventions (Lu, 2022).

Despite extensive global research on needle stick injuries, the experiences of allied health professionals, such as laboratory technicians, remain underexplored. While studies emphasize the importance of documenting healthcare workers' challenges (Emal et al., 2024), most focus on nurses and physicians, overlooking other vulnerable groups. In the Philippine context, particularly in Davao, there is a lack of localized research addressing the physical, psychological, and professional consequences of NSIs among allied health professionals. This study investigates a single-unit case involving an allied health professional exposed to a contaminated needle, aiming to provide insights into occupational hazards faced by healthcare workers.

II. Need of the Study

In healthcare settings, occupational hazards continue to be a major concern because they frequently result in negative physical, emotional, and psychological effects on healthcare providers. Their post-hazard experiences—specifically, their emotional reactions, social challenges, coping mechanisms, and the efficacy of workplace support systems—are not adequately examined, despite the crucial role these professionals play. It is crucial to comprehend these experiences in order to develop safer and more responsive work environments, enhance support systems, and inform policies. By concentrating on a healthcare provider's lived experiences after being exposed to occupational health hazards, this study fills this knowledge gap and offers insights that can improve provider well-being and institutional practices.

Population – Participant

Healthcare professionals who have encountered occupational health risks, particularly dirty needlestick injuries (DNSIs), made up the study's population. Two (2) participants were chosen using a purposive sampling technique, provided that they were healthcare professionals who were at least 25 years old and had at least one (1) year of experience after being exposed to a DNSI. This made sure that participants had enough first-hand knowledge to offer insightful commentary on the psychological, social, and professional effects of such occurrences. After consulting with the research advisor, an iterative process of data collection and analysis was used to reach data saturation with two participants. This suggested that the data gathered was sufficient to fully address the goals of the study.

Theoretical Lens

The Health Belief Model (HBM) and the Social Identity Threat Model are two theories used to understand the experiences of healthcare workers exposed to occupational health hazards. The HBM focuses on individual perceptions of susceptibility to health threats, the severity of those threats, the benefits of preventive actions, and barriers to taking those actions. It provides a structured approach to understanding how healthcare providers perceive and respond to the risk of needlestick injuries (NSIs). Healthcare workers' awareness of their vulnerability to NSIs plays a crucial role in their behavior, as they are more likely to adopt preventive measures such as using safety-engineered needles, wearing gloves, and adhering to proper disposal protocols. The perceived severity of NSIs greatly influences their preventive behaviors, with high-perceived severity leading to quicker reporting and post-exposure prophylaxis. Self-efficacy, or the confidence healthcare workers have in their ability to perform safety behaviors, is critical for improving workplace safety. The Health Belief Model is recommended for effective, cost-efficient training programs for healthcare workers exposed to invasive procedures and bloodborne pathogens. The Social Identity Threat Model is a framework that examines how social identities impact healthcare workers' responses to occupational health risks, such as needlestick injuries. It highlights how these threats, especially when unrecognized or unsupported by institutions, can affect their behavior and well-being. Healthcare workers often identify with their professional roles as competent and skilled caregivers, but exposure to needlestick injuries can lead to anxiety, guilt, or diminished competence. The social identity within healthcare settings also plays a significant role in how workers perceive and respond to these risks. Emotional responses to occupational health threats can be influenced by institutional support, which can either enhance psychological well-being or lead to feelings of isolation and frustration. Additionally, internalized stigma can affect healthcare workers' responses to health threats, leading to stress and neglect. The integration of the Health Belief Theory and the Social Identity Threat Model provides a comprehensive understanding of healthcare providers' responses to needlestick injuries, suggesting that personal beliefs about risks and the social and institutional contexts in which they work are key factors in shaping their decisions.

III. RESEARCH METHODOLOGY

The methodology section outline the plan and method that how the study is conducted. This includes research design, settings, data sources, data collection techniques, the study's reliability, the researcher's role, reflexivity, ethical considerations, and how the data is analyzed. The details are as follows;

Design

The study adopted an intrinsic case study design, which examined a single purposefully selected case that held particular interest instead of using cases for generalization purposes. The research aimed to investigate one specific case intensively by creating detailed descriptions of its distinct aspects inherent to the chosen context. The researchers used this methodology to explore the case independently so new insights would organically developed from the data instead of existing theoretical frameworks steering their analysis. The research approach allowed investigators to discover new insights about underexplored topics by staying receptive to unexpected findings. According to Ridder (2017), intrinsic case studies provide optimal comprehension of unusual or complicated phenomena by delivering essential knowledge to researchers and readers alike. This adaptability made it possible to comprehend the participants' lived experiences and the intricate circumstances surrounding them on a deeper level. Additionally, the method made it easier to produce rich, detailed data that more rigorous research designs might not be able to produce. When investigating real-life scenarios where variables are difficult to control or manipulate, such an approach is especially beneficial.

Settings

This research study was conducted in one of the private hospitals in Tagum City. The facility was established to be able to reach the neighbouring municipalities or cities of the Davao region and serve its geographical inhabitants and the vast industrial companies that are unreachable by the medical services offered by the Hospital.

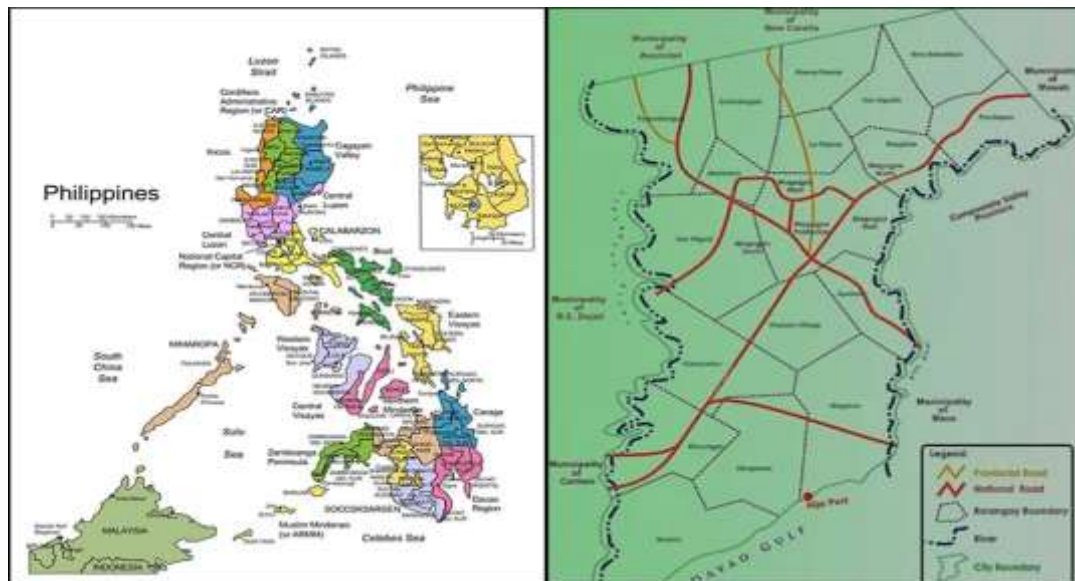


Figure 1. Site Map

Data Sources

This study employed a qualitative case study approach to analyze the experiences of two (2) healthcare providers who had been exposed to occupational health hazard. I used both in-depth, one-on-one interviews with two participants (1-2). Interviews focused on participants' descriptions, opinions, and reflections on their exposure to a needlestick injury, allowing us to obtain a deeper insight of its impact on their work and patient care.

In-depth interviews involved one-on-one interactions between the researcher and the participant. The purpose was gathered detailed and comprehensive information about the participant's experiences, opinions, beliefs, or attitudes on the topic. Aside from taking notes of the participant's behaviour and emotions, the researcher was recorded the discussion as part of data collection needed for the analysis. The participants who participated in the study facilitated as the primary data source, while secondary data was gathered from recent studies, articles, journals, and related literature.

Data Collection Procedure

In conducting this study, the researcher followed the procedures for data collection: First, the researcher would secure approval from the school ethics committee while formulating a research questionnaire. Then after, it will undergo validation with the validators/panelists for reliability testing. The researcher asked permission from the Program Chair to conduct the study. The researcher would afterward identify target participants. The researcher would formulate and send a letter of authorization to the Medical Director and Chief Nurse of the Hospital of selected health facilities in Tagum City before the interview and then after the scheduling of the interview. The participant's informed consent was given and gathered. A brief orientation to the study's preliminary procedures was provided. The researcher conducted a face-to-face individual interview that took 30 to 60 minutes for each participant, depending on the thorough conversation between the participant and the researcher. Participants were informed that the interview was audio-recorded. Following the interview, the audio was transcribed to make sure that the data was reliable.

After the interview process, participants received a letter conveying the researcher's heartfelt appreciation for their time, cooperation, and active participation in the data collection process. Respondents were assured that their data and information were kept strictly confidential. The compiled results from all the participants' healthcare provider for this study were analyzed using Braun and Clarke's method of thematic analysis.

Trustworthiness of the Study

The study's trustworthiness is crucial for its reliability and validity. It applies four essential elements: credibility, transferability, dependability, and confirmability. Credibility is determined by accurately capturing participants' experiences and excluding personal biases. Transferability is the extent to which findings can be applied to other settings or populations. The study ensured transferability by providing detailed descriptions of participant selection, participation criteria, and data collection methods. Dependability ensures consistent and reliable findings over time. The audit trail records the research process, allowing for objective review of methodology and findings. Confirmability ensures the findings are shaped by participants' perspectives, not by the researcher's biases. The study acknowledges limitations and uses systematic methods to analyze data. The use of Republic Act No. 11058 strengthens trustworthiness by embedding the findings within a legal framework that prioritizes healthcare workers' safety. This law mandates safety equipment, health training, and hazard assessments, making the findings relevant to policymakers, healthcare organizations, and other stakeholders.

Ethical Consideration

The study aimed to explore the impact of workplace safety on healthcare providers and their well-being. It was conducted with ethical considerations, including social value, risks and benefits, informed consent, and voluntary participation. Participants were informed about the study's objectives, procedures, potential risks, benefits, and rights. They were also given the right to withdraw at any time without consequences. The study respected healthcare providers' autonomy and their decision-making without external influence. Privacy and confidentiality were prioritized, with measures implemented to protect their identities and information from unauthorized access. This approach ensured participants felt secure in sharing their experiences without fear of exposure or misuse of their information.

Data Analysis

The data analysis for this study employed thematic analysis outlined by Braun and Clarke. This method focused on identifying, analyzing, and reporting patterns and themes within the qualitative data. This allowed gaining a deeper understanding of the healthcare providers' experiences of exposure to occupational health hazards, explicitly focusing on incidents such as dirty needle sticks.

The first step in the thematic analysis process is to familiarize oneself with the data. Once the in-depth interviews (IDIs) with healthcare providers exposed to occupational health hazards are completed, the researcher will thoroughly read and re-read the interview transcripts. This initial review helps the researcher become intimately familiar with the data, identifying recurring patterns, initial impressions, and emerging insights. Notes taken during the interviews will also be reviewed, further enhancing the researcher's understanding of the participants' experiences. This phase is crucial for gaining an overall sense of the data before deeper analysis begins.

The next step involves generating cluster themes and emergent themes. The researcher systematically analyzes the interview data. These coding responses reflect the participants' lived experiences of exposure to health hazards. These initial codes will label significant portions of the data; particularly those related to healthcare providers' experiences with incidents like dirty needle sticks. The process will involve categorizing these codes into groups representing major themes, ultimately reflecting the core aspects of the participants' experiences. Data reduction will occur as the researcher interprets the meaning behind each response, focusing on how healthcare providers feel and respond to their experiences, particularly following exposure to such health risks.

The third step is to search for themes. The researcher clusters the initial codes into broader, more abstract themes that encapsulate key aspects of the participants' experiences. This phase requires the researcher to evaluate whether these themes accurately capture the essence of the healthcare providers' experiences, particularly post-exposure to incidents like dirty needle sticks. The goal is to ensure that each theme reflects a critical element of the participants' feelings, actions, and perceptions regarding their exposure.

Once the themes are identified, the researcher moves to reviewing the themes. This involves revisiting the transcripts and the themes to verify that they accurately represent the data collected from the interviews. The researcher ensures that the themes are consistent with the responses from the healthcare providers and will cross-check them against the theoretical framework guiding the study. This step ensures that the themes align with the study's research goals and capture the full scope of the participants' experiences. If inconsistencies or gaps are identified during this process, the researcher will revisit the data for further analysis.

Following the review, the researcher proceeds with defining and naming the themes. In this step, each theme will be clearly defined and named according to the specific aspects of the participants' experiences. The researcher ensures that each theme represents a significant element of the healthcare providers' experiences related to their exposure to occupational health hazards, such as dirty needle sticks. The naming and defining of themes will provide clarity and structure to the analysis, making it easier to draw connections between the data and the research questions.

Lastly, the researcher proceeds to the final step: The following report presents the study results with a focus on the themes that have been established and their implications in explaining the experiences of healthcare workers exposed to occupational health risks. The researcher links the themes to the research questions to show how each theme helps in the analysis of the experiences of the healthcare providers. The report gives a detailed analysis of the findings and provides insights on the difficulties and effects experienced by the healthcare workers after exposure to occupational health hazards that helps enhance the safety measures and prevention in healthcare facilities. This final step also helps ensure that the participants' voices are represented as they are through selected quotes that relate to the themes. In this way, by describing these experiences as vivid and detailed as possible, the report seeks to bring about changes in policies and improve occupational health conditions.

IV. RESULTS AND DISCUSSION

Healthcare professionals frequently face a range of occupational health hazards that significantly impact their physical and psychological well-being. These hazards include exposure to infectious diseases, needlestick injuries, musculoskeletal strain from patient handling, prolonged standing, and the psychological toll of high-stress environments. Many professionals report chronic fatigue, burnout, and anxiety, often exacerbated by inadequate staffing, long working hours, and insufficient protective equipment. The fear of contracting or transmitting infections, especially during outbreaks, further contributes to emotional distress. Despite institutional efforts to implement safety protocols, healthcare workers often feel unsupported or inadequately trained, highlighting the need for more robust occupational health policies, mental health support systems, and ongoing education to mitigate risks and enhance workplace safety.

Exposure to occupational health hazards has significant implications for healthcare professionals, affecting their health, job performance, and overall career longevity. Physical consequences, such as injuries or infections, can lead to absenteeism, long-term health complications, or even disability, while psychological effects like stress, anxiety, and burnout can reduce job satisfaction and increase turnover rates. These issues not only compromise the well-being of healthcare workers but also impact the quality of patient care and strain healthcare systems. The cumulative effect may lead to workforce shortages, increased healthcare costs, and a decline in morale across healthcare settings. Therefore, addressing occupational hazards is essential to safeguarding both healthcare professionals and the broader health system. This study explores the following research questions:

What is the experience of the healthcare provider after being exposed to occupational health hazards? How does an exposed healthcare provider perceive and cope with the risks associated with occupational health hazards? What emotional, physical, and social challenges do an exposed healthcare provider face after being exposed to occupational health hazards? How do workplace policies and support systems influence the experience of an exposed healthcare provider in managing occupational health risks? What preventative strategies does an exposed healthcare provider adopt based on her experiences with occupational hazards? In what ways do an exposed healthcare provider's experiences with occupational health hazards affect their professional practices and personal well-being?

THE INCIDENT AND RESPONSE

The implications of needle stick injuries (NSIs) for healthcare professionals are far-reaching and multifaceted, affecting both individual well-being and the broader healthcare system. NSIs pose a serious risk of transmission of life-threatening bloodborne infections such as HIV, hepatitis B, and hepatitis C, leading to heightened anxiety and emotional distress among affected workers. The psychological toll is often compounded by underreporting, driven by fear of blame, stigma, or lack of institutional support. Contributing factors such as inadequate training, work overload, long shifts, and improper disposal practices reflect systemic gaps in occupational health and safety protocols. These injuries can result in time off work, costly medical follow-ups, and potential legal implications, which collectively burden healthcare institutions. Therefore, the persistence of NSIs underscores the urgent need for comprehensive preventive strategies, including proper training, improved safety-engineered devices, and a non-punitive reporting culture to protect healthcare workers and sustain the delivery of safe, high-quality care.

During the incident, Case A felt uncertain on the incident and it has a psychological impact on him and gave him so much troubles when at work. The participant feels scared, anxious, and psychologically uncomfortable after the incident. Due to uncertainty about infection, the healthcare provider's fear, anxiety, and psychological discomfort increased right after the needlestick injury.

The situation has put the participants in a vigilant state. He was impacted by the situation, though he is vigilant on her action, but she lamented that when it came to sharps procedures, the participant deliberately changed his behavior, becoming more cautious and focused. This change in behavior assisted in halting additional harm. Increased safety awareness and a discernible behavioral shift, marked by heightened vigilance during clinical procedures, were the results of the incident.

Fear of disease transmission and future employability, especially in relation to passing required medical exams, exacerbated the emotional distress. Hypervigilance and social disengagement were also brought on by the incident. Case A's is workplace systems and safety also contribute as one of the stressors. The participant stresses that keeping the intensive care unit (ICU) sterile and clean is crucial for patient care as well as the safety of healthcare personnel, particularly in avoiding infections and exposure to risks. The participant also makes a sincere attempt to adhere to what they have been taught, even though they acknowledge certain real-world limitations (such as workload, resource limitations, or time pressure). Environment, like an intensive care unit, clean and organized.

The participant expressed how efficient and well-planned procedures are, by obtaining a blood titer test following exposure, can lessen anxiety and increase safety. It demonstrates that prompt medical action is essential for controlling exposure risks and assisting the affected healthcare professional. During the post-exposure phase, safety and stress reduction were enhanced by the effective execution of hospital protocols and prompt access to testing procedures. The participant brings up the possibility that the current procedures for orientation and training, particularly for new hires, are deficient. He also recommends that thorough instruction on infection control procedures, such as those for MRSA and other transmissible diseases, be a part of pre-clinical exposure training. Likewise, the participant feels that additional resources and frequent refresher training would significantly increase preparedness and lower risks, even though materials like posters are useful. To enhance occupational safety is also a must, especially for new hires, a more comprehensive and proactive approach to information dissemination is needed. This includes thorough, pre-clinical exposure orientations detailing hospital policies, particularly regarding specific infection control measures like MRSA and transmission-based precautions. While existing posters are helpful, supplemental materials and regular refresher training for all healthcare workers would significantly improve preparedness and safety.

The participant also emphasizing that safety procedures include handling the psychological and emotional fallout following an incident in addition to preventing injuries. Rapid diagnosis, prompt results, and routine health examinations all contribute to a safe and encouraging workplace by lowering uncertainty. The experience underscored the need for strict adherence to safety procedures as a preventative measure against similar injuries. To minimize healthcare worker anxiety and ensure safety, strict protocol adherence, rapid patient diagnostics based on exposure risk, and expedited test result delivery are crucial, alongside regular medical check-ups for staff.

The participant is making the point that safety and care quality is compromised by excessive workloads brought on by understaffing. According to Department of Health guidelines, nurse-patient ratios must be adequate in order to minimize errors, guarantee effective infection control, and protect patients and healthcare professionals. The provider emphasized the significance of manageable patient-to-nurse ratios and linked occupational risk to excessive workload and staff shortages. Maintaining an adequate patient-nurse ratio is crucial for preventing cross-contamination; staffing shortages lead to rushed care, increasing the risk of errors. Adherence to DOH protocols and appropriate staffing levels are essential for patient safety. The participant emphasized that even skilled professionals may forget or neglect standard procedures when under stress or fatigue, may overlook or forget standard procedures. Such memory lapses can result in the improper disposal of infectious or hazardous waste, putting patients, other staff, and the environment at greater risk. Busy schedules and high-stress environments, like a full-capacity hospital, can lead to lapses in memory, resulting in improper waste disposal.

The participant claims that he felt less anxious or emotionally impacted by the possible health risks of the exposure because their immunity was shown to be strong. After the event, emotional stability and less psychological distress were facilitated by knowledge of pre-exposure vaccination status. The participant had already undergone pre-clinical exposure testing two years prior and was found to have a high titer level (strong immune response, likely from vaccination). Long before the recent workplace incident, this immune protection was recognized and established.

Workplace systems and safety are essential components of organizational management, directly impacting employee well-being, operational efficiency, and legal compliance. Their significance can be understood across several key dimensions. But one thing for sure, working environment should be given importance to avoid incidents and ensure safety. In accordance with hospital policy, the participant notified the head nurse right away. The hospital's efficient and well-organized policy ensures a safe and controllable experience in handling such situations. The participant's seamless experience implies that the institutional procedure supports impacted staff and functions effectively. By promptly reporting the incident means recognizing the significance of prompt communication in initiating safety measures and medical support. The participant promptly reported it to his head nurse, as required, and experienced a seamless, efficient process, aligning with our well-organized needlestick injury policy and demonstrating effective precautionary measures.

Another situation happened, when the participant experienced emotional distress after an incident, but the head nurse's practical advice and empathy significantly reduced her anxiety, demonstrating the effectiveness of workplace support networks. During the post-event period, the provider received consolation and validation from the administrative and emotional support of the institution's leaders. Following an initial distressing incident, the participants received significant emotional and informational support from my head nurse. It effectively alleviated his anxieties.

THE RESEARCH STUDY

This research was carried out at a private hospital located in Tagum City. The facility was established to extend healthcare services to nearby municipalities and cities within the Davao region, aiming to serve both the local population and the numerous industrial companies that are not easily reached by existing medical services in the area.

The study involved two (2) healthcare providers who had experienced a dirty needlestick injury (DNSI) and had at least one (1) year of exposure in the field. Participants were aged 25 and above, ensuring that the insights gathered came from individuals with meaningful experience. This criterion allowed for a deeper exploration of the injury's impact on their professional practice. Data saturation was achieved with two participants through an iterative process of data collection and analysis conducted in collaboration with my advisor, indicating that the data collected was sufficient to address the research question in depth.

This study utilized a qualitative case study approach to explore the lived experiences of two (2) healthcare providers exposed to an occupational health hazard. Data were collected through in-depth, one-on-one interviews, focusing on the participants' personal accounts, insights, and reflections regarding their experience with a needlestick injury. These interviews provided a deeper understanding of how such incidents influenced their professional practice and patient care.

The one-on-one interviews aimed to gather detailed and comprehensive information about the participants' experiences, beliefs, and attitudes toward the incident. In addition to observing and noting participants' behaviors and emotional responses, the interviews were audio-recorded to support accurate and thorough data analysis. The primary source of data was the participants themselves, while secondary data were obtained from relevant studies, articles, journals, and related literature to provide context and support for the finding.

The study employed a "realist" narrative structure, featuring rich descriptions and carefully edited quotes from the participating nurses. The goal was to provide an accurate representation of their experiences, particularly in relation to organizational and psychological challenges. To ensure the credibility of the findings, a preliminary draft was shared with the participants for review. Feedback was collected through follow-up interviews, during which participants were asked questions such as: Does this description accurately reflect your experience? Do the identified themes align with your reality? Are there any important themes we may have missed?

THEMES

The following themes delve into the experiences of two healthcare professionals (Participants 1 and 2) who faced occupational health risks, including exposure to needlestick injuries. Using qualitative data gathered through in-depth interviews, the analysis identifies and compares three key themes: uncertainty and psychological impact, workplace systems and safety, and seeking and utilizing support and response. Exploring these themes highlights both commonalities and differences in the participants' experiences, offering meaningful insights into how healthcare professionals navigate the social, systemic, and emotional dimensions of occupational exposure.

Uncertainty and Psychological Impact

Lazarus and Folkman's transactional model of stress and coping posits that stress results from the dynamic interaction between an individual and their environment, rather than being solely triggered by external events. In the context of needlestick injuries, nurses' reactions can be interpreted through the process of cognitive appraisal—beginning with a primary appraisal, where the perceived risk of infection is assessed, and followed by a secondary appraisal, which considers available resources and coping strategies for managing the situation (Subramaniam et al., 2022).

Uncertainty surrounding the risk of potential infections can provoke strong emotional reactions, affecting the mental health and performance of healthcare professionals. In response, nurses often adopt problem-focused coping strategies, such as seeking information about risks and adhering to safety protocols. They also employ emotion-focused coping methods, including seeking social support and using cognitive reframing, which play a crucial role in maintaining their psychological well-being during and after needlestick injury incidents (Ezie et al., 2023).

Anxiety due to uncertainty

This theme highlights the emotional and psychological burden faced by healthcare workers, particularly nurses, following a needlestick injury. Much of the mental strain arises from the uncertainty regarding the patient's health status—especially when the risk of transmitting infectious diseases is unclear. This uncertainty often leads to significant emotional distress, including feelings of anxiety, fear, and ongoing mental unease, as affected individuals may spend weeks or even months awaiting test results and fearing potential infection or illness.

Heightened Vigilance

This theme explores how healthcare workers adjust their behaviors and adopt preventive strategies after experiencing occupational health risks, such as needlestick injuries. Such incidents often lead to significant changes, enhancing their awareness

of workplace safety and reinforcing protective practices when handling sharps and needles. The proactive measures taken by nurses reflect their dedication to protecting themselves and preventing similar incidents from happening in the future.

Workplace Systems and Safety

From a Systems Theory perspective, healthcare organizations operate as complex systems in which interconnected components collectively impact safety outcomes, including the occurrence of needlestick injuries (Reason, 2000). These components include institutional policies and procedures, technological tools and equipment, staff education and training, workload and staffing levels, communication channels, organizational culture, feedback systems, and the broader external environment—such as regulatory standards and resource availability (Reason, 2000). Within this system, effective communication and strong incident-learning mechanisms play a crucial role in preventing adverse events like needlestick injuries.

Work Environment

This theme focuses on the institutional and environmental factors within healthcare settings that influence how healthcare providers handle and respond to occupational health hazards. It encompasses aspects such as hygiene practices, compliance with protocols, workload demands, and the practical application of training and education. Despite facing occasional constraints and challenges, nurses consistently work to uphold a safe work environment, demonstrating their dedication to professional standards and workplace safety.

Process Flow

This cluster theme highlights how institutional processes and structures work together to safeguard healthcare workers from occupational hazards. It explores the integration of policies, educational initiatives, and physical reminders—such as posters—into the hospital's daily operations. The theme underscores that proactive educational programs, clear safety communication, and consistent reinforcement of safety protocols play a key role in minimizing occupational accidents, particularly among newly hired staff.

Safety Protocols

The cluster theme “Safety Protocols” highlights the crucial role of adhering to institutional guidelines in preventing occupational hazards, including needlestick injuries. The participants showed a clear understanding of the importance of following safety protocols, particularly during procedures involving sharp instruments and high-risk clinical tasks. They emphasized that the risk of exposure increases when diagnostic tests are delayed, when staff are overworked, and when junior personnel lack adequate supervision and guidance. Despite fatigue and long working hours, healthcare workers reaffirmed the importance of strictly following safety procedures. Their support for regular health checks and timely diagnostic processes reflects a strong commitment to maintaining a safe and secure healthcare environment.

Workload

The “Workload” cluster theme illustrates how excessive patient loads and staff shortages directly impact healthcare service delivery, especially in hospitals operating at full capacity. The quality and safety of care decline when nurses are required to handle overwhelming caseloads. High patient volumes combined with insufficient staffing create a workload that can lead to lapses in critical procedures such as waste disposal and infection control, increasing the risk of medical errors and patient contamination. Adhering to Department of Health guidelines and maintaining appropriate patient-to-nurse ratios are essential strategies to minimize healthcare risks and ensure safe operations in medical facilities.

Pre-exposure Vaccination Status

Healthcare institutions implement pre-exposure vaccination and immunity testing as key measures to alleviate work-related anxiety and emotional stress among staff following occupational health exposures. The participant noted that proactive health screenings, such as antibody tests, provide psychological reassurance and enhance emotional stability, especially during periods of heightened uncertainty like potential exposures.

Seeking and Utilizing Support and Response

Social support systems play a crucial role in helping nurses cope with occupational stressors, such as the aftermath of needlestick injuries. Nurses rely on a variety of support sources, including professional contacts like colleagues, supervisors, and occupational health services, as well as personal networks such as mental health professionals, family, and friends (Wu et al., 2023). However, several significant barriers often hinder access to this support. These include fear of stigma related to vulnerability or mental health concerns, limited awareness of available resources, time constraints due to heavy workloads, and workplace cultures that may implicitly or explicitly discourage seeking help (Thapa et al., 2022). Identifying existing support networks and understanding the common challenges nurses face is essential for developing effective interventions to help them manage difficult professional experiences like needlestick injuries (Thapa et al., 2022; Wu et al., 2023).

Prompt Reporting of Incident

This cluster highlights the importance of having immediate reporting procedures in place for occupational exposures, such as needlestick injuries. One participant initially hesitated to report the incident due to personal caution; however, the perceived severity of the injury and his emotional response ultimately prompted him to take action. The data underscores the need for strict protocol enforcement alongside the creation of a judgment-free, rapid reporting system as critical components of effective occupational safety practices.

Support System

This sub-theme emphasizes the vital role of psychological support services in healthcare institutions, especially in addressing occupational trauma. It highlights the importance of implementing proactive counseling and mental health initiatives that are visible, easily accessible, and normalized within the workplace environment.

Table 1. Data Collection Matrix: Type of Information by Source

Information/ Information Source	Interviews	Observation	Documents	Audio-Visual Materials
Case 1	YES	YES		
Case 2	YES	YES		

HOSPITAL PLANNING

Hospital preparedness plays a pivotal role in shaping the experience of healthcare providers exposed to occupational health hazards, such as needlestick injuries, infectious disease exposure, or chemical accidents. The level of preparedness directly affects not only the provider's physical safety but also their emotional resilience, confidence in the system, and ability to return to effective practice.

1. Preventive Infrastructure

Prepared hospitals have clear, well-communicated policies and protocols for preventing occupational hazards. This includes: Engineering controls such as sharps disposal systems, needleless IV systems, and physical barriers. Administrative controls including proper staffing, shift rotation to prevent fatigue, and mandatory safety training. Personal protective equipment (PPE) readily available and appropriately used. These measures reduce the likelihood of exposure and create a culture of safety where staff feel protected.

2. Immediate Response Systems

When an exposure does occur, the speed and efficiency of the hospital's response greatly influence the healthcare provider's experience. Prepared hospitals offer: Rapid incident reporting mechanisms that are judgment-free and confidential. Immediate medical evaluation and baseline testing (e.g., HIV, HBV, HCV status). Post-exposure prophylaxis (PEP) and vaccination where applicable. Clear follow-up protocols to monitor health outcomes over time. A quick, coordinated response reassures healthcare workers that their safety is a priority.

3. Psychosocial Support

Occupational exposures often carry psychological burdens, including anxiety, fear of infection, and stigma. A prepared hospital will have:

Onsite counseling or psychological support available immediately and ongoing if needed. Peer support systems or debriefing groups to process the experience and reduce isolation. A non-punitive culture that avoids blame and supports emotional recovery. These supports help reduce the long-term psychological toll of the incident.

4. Training and Drills

Hospitals that regularly conduct training simulations and refresher courses on managing exposures empower their staff to respond effectively. This builds confidence and ensures that providers know exactly what steps to take during an incident, reducing panic and mistakes.

5. Evaluation and Learning Systems. After any exposure incident, a prepared hospital will:

Conduct a root cause analysis to determine how the exposure occurred.

Implement improvements to prevent recurrence.

Share lessons learned with staff, fostering a culture of continuous improvement.

This turns an adverse event into an opportunity for institutional growth and increased safety.

DISCUSSION

The experience of a healthcare provider exposed to an occupational health hazard is shaped not only by the event itself but also by how well the hospital is prepared to prevent, manage, and learn from such incidents. Comprehensive preparedness that includes technical, emotional, and procedural dimensions fosters a safer, more supportive environment for healthcare workers and ultimately enhances the quality of patient care.

Hospitals implement strict protocols to manage cases where nurses are exposed to occupational health hazards to ensure their safety and prevent further risk. These protocols typically begin with immediate first aid or decontamination procedures, depending on the nature of the exposure—whether biological, chemical, or physical. For instance, in the case of a needlestick injury, nurses are required to wash the area thoroughly and report the incident promptly. Immediate reporting is critical as it allows for timely evaluation and intervention, including prophylactic treatments if necessary.

Following initial management, hospitals usually conduct a comprehensive risk assessment to determine the extent of the exposure and the potential health implications. This involves medical evaluation by occupational health personnel and may include laboratory testing, especially for exposures to bloodborne pathogens such as HIV or Hepatitis B and C. The affected nurse may be placed under medical surveillance and given necessary treatment or vaccinations, depending on the findings. Psychological support is also often provided, acknowledging the mental stress such incidents can cause.

Additionally, hospitals emphasize preventive strategies as part of their occupational health protocol. This includes regular training on safety practices, proper use of personal protective equipment (PPE), and adherence to standard precautions. Incident reports are reviewed not only for immediate response but also to identify systemic gaps and prevent recurrence. By following these protocols, hospitals aim to maintain a safe working environment and uphold the health and well-being of their nursing staff.

Table 2. Evidence From the Case, Questions for a Hospital Plan, and References

Evidence From the Case	Question for the Plan	References Useful
Uncertainty and Psychological Impact	Why should a hospital-should address issues on personnel staff exposed to hazard?	Tait, S., Richardson, R., & Williams, M. (2018).
Workplace Systems and Safety	Who should be involved in developing the plan?	Zhou, Y., Zhang, L., & Tang, Y. (2020).
Seeking and Utilizing Support and Response	Should the leadership for coordinating care be identified within one office or team?	Clarke, S., Probst, T., & Guldenmund, F. (2019).
Work Environment	How should the management implement on maintaining the physical environment as needed ?	Wei, H., Roberts, P., Strickler, J., & Corbett, R. W. (2020).
Process Flow	What types of high-risk conditions and interventions should be covered in the plan?	Gershon, R. R. M., Qureshi, K. A., & Rubin, M. S. (2020).
Safety Protocols	How the hospital Strictly observe on the Implementations on Safety protocols?	DeJoy, D. M., Della, L. J., & Wilson, M. G. (2021).
Workload	What provisions are made for the immediate safety of staff?	Carayon, P., & Gurses, A. P. (2021).
Pre-exposure (Vaccination Status)	How protocols should be observed within the hospital premise?	Simonsen, L., Taylor, R. J., Young-Xu, Y., Haber, M., May, L., & Klugman, K. P. (2021).

EPILOGUE

The significance of healthcare providers being exposed to occupational health hazards lies in the profound implications for both individual workers and the broader healthcare system. Exposure to hazards such as infectious diseases, chemical agents, or physical injuries not only threatens the immediate health and safety of healthcare providers but also affects patient care quality and institutional functioning. When healthcare workers are exposed, they face risks of acute illness, chronic health problems, and psychological stress, which can lead to absenteeism, reduced productivity, and high turnover rates. Moreover, such exposures can contribute to the transmission of infections within healthcare facilities, posing risks to vulnerable patients. Recognizing and addressing occupational hazards is therefore essential to safeguarding healthcare workers' well-being, maintaining a resilient workforce, and ensuring continuous, safe patient care. Ultimately, effective management of these risks underscores the ethical responsibility of healthcare institutions to protect their staff and uphold public health standards. Finally, the occupational exposure to health hazards remains a significant concern for healthcare providers, particularly nurses and support staff. Strengthening workplace safety protocols, improving training, ensuring complete vaccination, and providing psychological support are crucial to reducing risks and improving healthcare worker safety.

V. IMPLICATIONS

The research findings have significant implications for nursing practice and education and research which can be used to strengthen different healthcare system components through better understanding of healthcare worker experiences with occupational health hazards. The research investigated healthcare provider experiences with occupational health risks by studying their psychological and emotional responses and institutional challenges after exposure. The research examined these experiences to generate knowledge that will guide nursing policy development and practice standardization and educational curriculum development.

Two healthcare professionals participated in the qualitative case study research after fulfilling the established eligibility requirements. Participants involved in this research revealed plentiful information about their occupation-related experiences through in-depth, semi-structured interview. The interview method enabled participants to develop detailed reflective accounts about their thoughts and actions when dealing with clinical incidents. Thematic analysis allowed researchers to study participant narratives by which they identified three main concepts. The analyzed themes gave comprehensive descriptions of both the psychological distress caused by incidents alongside the organization-based support frameworks. A healthcare worker experienced a needlestick injury which represents a frequent clinical hazard that creates substantial anxiety because of infection risks.

The research findings present implications which affect nursing practice together with nursing education and nursing research. This assessment incorporates realistic recommendations from healthcare providers who experience hazards at work through NSIs using evidence from existing research along with the Health Belief Model and Social Identity Threat Model and Stress and Coping Theory.

Healthcare workers encounter multiple emotional and psychological and procedural difficulties after experiencing needlestick injuries according to the study. The establishment of mental health support systems stands as a vital implication for nursing practice. Healthcare institutions must integrate accessible mental health support services to address the psychological needs of workers who experience NSIs. Healthcare institutions must establish standard procedures for immediate counseling and psychological first aid and post-incident debriefing to help workers manage their fear and anxiety and uncertainty after exposure. Organizations need to reinforce their formal report systems as part of their essential implications. The reporting system's observed efficiency proves that supportive environments enable quick incident reporting. Institutions need to develop specific and compassionate documentation protocols without disciplinary actions to achieve prompt and accurate reporting of exposure incidents.

Furthermore, security culture together with protocol compliance needs to be reinforced routinely. Neutral safety training coupled with leader reinforcement and peer example sessions protects the existing safety culture. Healthcare organizations must enforce bloodborne exposure control procedures while evaluating their enforcement by periodic assessment. Managers must pay attention to workforce volume and staff numbers because these become major aspects in patient safety. The study participants identified both fatigue and high nurse-patient ratios as key factors that increase the risk of NSIs. Healthcare institutions need to focus on providing sufficient staff and balanced shift arrangements to minimize errors and maintain safe focused practice. It is essential to add pre-exposure screenings and necessary vaccinations to employee health programs as mandatory elements. Healthcare workers experience less anxiety and show better response to exposure incidents when routine immunity status screening (such as Hepatitis B titer) and necessary vaccinations are provided.

The nursing education curriculum requires the addition of occupational hazard modules. Nursing programs must teach students in detail about occupational safety and NSI protocols and bloodborne pathogen prevention. Learning techniques that use real-life simulation methods combined with case-based education help students learn better critical thinking skills and preparedness. Coping skills together with resilience capabilities require development from the perspective of nurses. Nursing students who receive psychosocial training about stress management and resilience development will become more capable of handling emotional challenges that come with occupational exposure.

The emphasis on reflective practice and self-efficacy is also essential. Students should be encouraged to engage in reflective journaling and post-incident analysis to foster self-awareness and confidence in handling adverse events. The Health Belief Model can be used to illustrate how perceived risk influences behavior. Nursing education should also promote ethical and professional responsibility. Educators must stress the ethical obligation of nurses to report incidents, follow established protocols, and seek institutional support. Students should be made aware of legal and professional standards concerning workplace safety early in their training.

Regarding nursing research, several important areas require attention. One is the exploration of underreported occupational exposures. Further studies are needed to understand why many healthcare workers choose not to report NSIs. Research can explore workplace culture, fear of reprisal, and systemic inefficiencies. There is also a need for the development of evidence-based interventions. Researchers should evaluate the effectiveness of mental health support programs, debriefing protocols, and safety training in reducing the stress and recurrence of NSIs.

Longitudinal studies on psychological outcomes are recommended to investigate the long-term impacts of occupational exposure on mental health, job satisfaction, and staff retention. These studies can provide evidence to inform policy development and workforce support strategies. Additionally, assessing organizational culture and leadership is essential. Qualitative and mixed-method studies can examine how institutional culture, leadership involvement, and peer support systems influence staff behavior and compliance with safety environment protocols.

RECOMMENDATIONS

Any society depends heavily on healthcare as its fundamental structure which ensures the health of both individuals and communities. Healthcare providers encounter occupational health hazards because of their work responsibilities. Healthcare providers in Tagum City Davao del Norte encounter major health and safety risks because they regularly encounter infectious diseases and hazardous chemicals and physical injuries and emotional stress. Organizations must implement three-phase response measures that combine safety procedures with professional training and emotional support services for healthcare providers to combat these hazards.

First, healthcare institutions should institutionalize psychological first aid for exposed healthcare workers. This includes creating structured programs that offer emotional debriefings, counseling referrals, and mental health monitoring immediately after incidents occur. It is vital to normalize help-seeking behavior and address emotional trauma before it becomes chronic.

Second, all hospitals should enforce essential safety instruction and simulation educational programs for their personnel. The required training must occur frequently and focus on essential skills while using realistic situations. Healthcare institutions should use simulation methods to help nurses develop skills in managing sharp hazards while also learning to handle accidental exposures and follow organizational protocols in demanding situations. Staff preparedness at every level is maintained through regular drills combined with competency evaluation procedures.

Third, organizations need to build an environment where healthcare providers can safely report occupational exposures. Healthcare providers need an environment that enables them to report incidents without facing punishment or stigma. Organizations should focus on incident analysis instead of fault-finding through their policies. Feedback systems need to function by processing reports while showing visible improvements in safety standards.

Fourth, healthcare facilities need to provide sufficient staff members and establish equitable work scheduling systems. Research showed that nurse fatigue together with burnout created conditions that raised the likelihood of healthcare worker exposure. Healthcare organizations need to develop human resource policies which match staff numbers to patient care requirements and avoid extended or back-to-back shift assignments. The commitment to workforce wellness contributes to both safety performance and protection of patient well-being.

Fifth, healthcare organizations must require both pre-employment testing and yearly updates of vaccination titers from their staff members. Occupational health departments need to verify that healthcare workers receive proper vaccinations and maintain

awareness about their protection status. Prior immunity exposure in staff members decreases their anxiety levels and speeds up their post-exposure decision-making process.

Finally, healthcare systems need to endorse continuous research together with data collection activities as their final step. Healthcare institutions need to actively gather data about NSI incidents together with reporting behaviors and staff feedback and post-exposure outcomes. Healthcare institutions use collected information to identify trends and create interventions while assessing the performance of their implemented policies. Academic institutions require support for collaborative research activities because this approach generates innovative practices to advance occupational health.

REFERENCES

- Anandadurai, D., Praisie, R., Venkateshvaran, S., Nelson, S. B., & Thulasiram, M. (2024). Awareness, perception, and practice regarding Needle-Stick injury and its prevention among healthcare workers in a tertiary care hospital in southern India. *Cureus*. <https://doi.org/10.7759/cureus.55820>
- Anandadurai, D., Praisie, R., Venkateshvaran, S., Nelson, S. B., & Thulasiram, M. (2024). Awareness, perception, and practice regarding Needle-Stick injury and its prevention among healthcare workers in a tertiary care hospital in southern India. *Cureus*. <https://doi.org/10.7759/cureus.55820>
- Al-Qahtani, S., Elzahrany, Y., Alahmed, M., Alanezi, S., Obaid, R., Almutairi, M., Dahman, A., Alqahtani, R., & Kofi, M. (2021). Prevalence, Underreporting and Barriers of Needle Stick and Sharps Injuries (NSSIs) among Nurses at Primary Healthcare Centers, Riyadh, Saudi Arabia. *Family Medicine and Primary Care Open Access*, 5(2). <https://doi.org/10.29011/2688-7460.100067>
- Alfulayw, K. H., Al-Otaibi, S. T., & Alqahtani, H. A. (2021). Factors associated with needlestick injuries among healthcare workers: implications for prevention. *BMC Health Services Research*, 21(1). <https://doi.org/10.1186/s12913-021-07110-y>
- Aliyo, A., & Gemechu, T. (2024). Prevalence and risk factors of needlesticks and sharp injuries among healthcare workers of hospital in Bule Hora, West Guji Zone, Ethiopia. *Environmental Health Insights*, 18. <https://doi.org/10.1177/11786302241272392>
- Abdelmalik, M. A., Alhowaymel, F. M., Fadlalmola, H., Mohammaed, M. O., Abbakr, I., Alenezi, A., Mohammed, A. M., & Abaoud, A. F. (2023). Global prevalence of needle stick injuries among nurses: A comprehensive systematic review and meta - analysis. *Journal of Clinical Nursing*, 32(17–18), 5619–5631. <https://doi.org/10.1111/jocn.16661>
- Alfulayw, K. H., Al-Otaibi, S. T., & Alqahtani, H. A. (2021). Factors associated with needlestick injuries among healthcare workers: implications for prevention. *BMC Health Services Research*, 21(1). <https://doi.org/10.1186/s12913-021-07110-y>
- Alinejad, N., Bijani, M., Malekhosseini, M., Nasrabadi, M., Harsini, P. A., & Jeihooni, A. K. (2023). Effect of educational intervention based on health belief model on nurses' compliance with standard precautions in preventing needle stick injuries. *BMC Nursing*, 22(1). <https://doi.org/10.1186/s12912-023-01347-0>
- APA PsycNet. (n.d.). <https://psycnet.apa.org/record/2021-47925-002>
- Bahat, H., Hasidov-Gafni, A., Youngster, I., Goldman, M., & Levzion-Korach, O. (2021). The prevalence and underreporting of needlestick injuries among hospital workers: a cross-sectional study. *International Journal for Quality in Health Care*, 33(1). <https://doi.org/10.1093/intqhc/mzab009>
- Bazie, G. W. (2020). <p>Factors Associated with Needle Stick and Sharp Injuries Among Healthcare Workers in North East Ethiopia</p> *Risk Management and Healthcare Policy*, Volume 13, 2449–2456. <https://doi.org/10.2147/rmhp.s284049>
- Bahat, H., Hasidov-Gafni, A., Youngster, I., Goldman, M., & Levzion-Korach, O. (2021). The prevalence and underreporting of needlestick injuries among hospital workers: a cross-sectional study. *International Journal for Quality in Health Care*, 33(1). <https://doi.org/10.1093/intqhc/mzab009>
- Borges, A., Oyekunle, A. A., & Idowu, O. A. (2020). Exposure to occupational-related blood and fluids infections, accidental injuries, and precaution practices among healthcare workers in a tertiary hospital in Nigeria. *African Journal of Health, Nursing, and Midwifery*, 4(6), 223–238. Retrieved from AB Journals.
- Bagnasco, A., Zanini, M., Catania, G., Watson, R., Hayter, M., Dasso, N., Dini, G., Agodi, A., Pasquarella, C., Zotti, C. M., Durando, P., & Sasso, L. (2020). Predicting needlestick and sharps injuries in nursing students: Development of the SNNIP scale. *Nursing Open*, 7(5), 1578–1587. <https://doi.org/10.1002/nop2.540>
- Bagnasco, A., Zanini, M., Catania, G., Watson, R., Hayter, M., Dasso, N., Dini, G., Agodi, A., Pasquarella, C., Zotti, C. M., Durando, P., & Sasso, L. (2020). Predicting needlestick and sharps injuries in nursing students: Development of the SNNIP scale. *Nursing Open*, 7(5), 1578–1587. <https://doi.org/10.1002/nop2.540>
- Boskey, E., PhD. (2024). How the Health Belief Model Influences Your Behaviors. *Verywell Mind*. <https://www.verywellmind.com/health-belief-model-3132721>
- Benslimane, A., El-Mansouri, A., & Alami, M. (2020). Barriers to the adoption of needlestick injury prevention strategies among healthcare workers. *Journal of Occupational Safety and Health*, 28(2), 156–165. <https://doi.org/10.1080/1331677X.2020.1823641>
- Bouya, S., Balouchi, A., Rafiemanesh, H., Amirshahi, M., Dastres, M., Moghadam, M. P., Behnamfar, N., Shyebak, M., Badakhsh, M., Allahyari, J., Mawali, A. A., Ebadi, A., Dezhkam, A., & Daley, K. A. (2020b). Global Prevalence and Device Related Causes of Needle Stick Injuries among Health Care Workers: A Systematic Review and Meta-Analysis. *Annals of Global Health*, 86(1), 35. <https://doi.org/10.5334/aogh.2698>
- CDC - Stop Sticks : Sharps Injuries - NORA. (n.d.). <https://www.cdc.gov/nora/councils/hcsa/stopsticks/sharpsinjuries.html>
- Chowdhury, R., Musekwa, O. P., & Makhado, T. G. (2021). Knowledge regarding post-exposure prophylaxis and bloodborne infections among healthcare professionals in Southern Africa. *Health SA Gesondheid*, 27, Article 66. Available at SciELO.
- Çelebi, A., Erdoğan, M., & Savaş, H. (2020). Factors influencing needle stick injuries

- in healthcare workers: A survey of nurses in Turkey. *Journal of Advanced Nursing*, 76(10), 2372–2381. <https://doi.org/10.1111/jon.15158>
- Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Bywaters, D., & Walker, K. (2020). Purposive sampling: complex or simple? Research case examples. *Journal of Research in Nursing*, 25(8), 652–661. <https://doi.org/10.1177/174498712092720>
- Department of Health, Philippines. (2020). Online National Electronic Injury Surveillance System (ONEISS) Lu,R.A(2022)
- Dulon, M., Stranzinger, J., Wendeler, D., & Nienhaus, A. (2020). Causes of Needlestick and Sharps Injuries When Using Devices with and without Safety Features. *International Journal of Environmental Research and Public Health*, 17(23), 8721. <https://doi.org/10.3390/ijerph17238721>
- Device Related Causes of Needle Stick Injuries among Health Care Workers: Related Causes of Needle Stick Injuries among Health Care Workers: A Systematic Review and Meta-Analysis. *Annals of Global Health*, 86(1), 35. <https://doi.org/10.5334/aogh.2698>
- Ezie, K. N., Amekpor, F., Scott, G. Y., Andigema, A. S., Musa, S. S., Takoutsing, B. D., & Lucero-Prisno, D. E., III. (2023). Healthcare workers' safety; a necessity for a robust health system. *Annals of Global Health*, 89(1). <https://doi.org/10.5334/aogh.4167>
- Ergün, M., Öztürk, H., & Şahin, M. (2020). Awareness and practices related to needle stick injuries among healthcare workers: A cross-sectional study. *Safety and Health at Work*, 11(4), 472–478. <https://doi.org/10.1016/j.shaw.2020.03.003>
- Folkman, S. (2013). Stress: appraisal and coping. In Springer eBooks (pp. 1913–1915). https://doi.org/10.1007/978-1-4419-1005-9_215
- Green, E. C., Murphy, E. M., & Gryboski, K. (2020). The health belief model. *The Wiley Encyclopedia of Health Psychology*, 211–214. <https://doi.org/10.1002/9781119057840.ch68>
- Govender, N. (2023). The knowledge, attitudes and practices of health care workers regarding the occupational exposure to blood and bodily fluids in a public hospital, KwaZulu-Natal. <https://doi.org/10.51415/10321/5278>
- Howard, T. (2025, February 13). 5 steps to take following a needlestick. MedSafe. <https://www.medsafe.com/compliance-topics/5-steps-to-take-following-a-needlestick-and-how-to-prevent-an-injury-in-the-workplace/Hambridge>, K. (2022). The psychological impact of sharp injuries sustained by medical students. *British Journal of Hospital Medicine*, 83(1), 1–7. <https://doi.org/10.12968/hmed.2021.0385>
- Halimi, A., Gheshlagh, R. G., Ansari, M., Zakariaee, S. S., & Zandi, M. (2024). Prevalence of needle-stick injury in Iranian nurses: an updated systematic review and meta-analysis of observational studies. *BMC Nursing*, 23(1). <https://doi.org/10.1186/s12912-024-01914-z>
- Harris, R. C., Harris, A. D., & Meyer, B. (2020). Organizational influences on needle stick injury prevention among healthcare workers. *American Journal of Infection Control*, 48(7), 771–776. <https://doi.org/10.1016/j.ajic.2019.10.011>
- Hunziker, S., & Blankenagel, M. (2024). Research design in business and management. In Springer eBooks. <https://doi.org/10.1007/978-3-658-42739-9>
- Imran, N., Shah een, R., & Noor, S. (2021). The impact of perceived severity of needlestick injuries on healthcare workers' behaviors. *Journal of Health Communication*, 26(4), 350–358. <https://doi.org/10.1080/10810730.2021.1902036>
- Inoue, M., Nishimoto, M., & Nakamura, H. (2023). Organizational and peer support for needle stick injury prevention in healthcare settings. *Journal of Clinical Nursing*, 32(3-4), 437–446. <https://doi.org/10.1111/jocn.16736>
- Jetten, J., Haslam, S. A., & Postmes, T. (2021). Social identity and safety behavior in healthcare workers: The role of group norms. *Social Science & Medicine*, 267, 113316. <https://doi.org/10.1016/j.socscimed.2020.113316>
- Jung, E., Seo, W., & Kim, H. (2022). Factors influencing healthcare workers' protective behaviors against needle stick injuries: A study of hospital employees. *Journal of Workplace Health Management*, 41(1), 61–68. <https://doi.org/10.1108/JWHM-01-2022-0002>
- Koskei, E. C. (2024). Factors Contributing to Occupational Injuries and Ill Health among Healthcare Workers in Selected Hospitals in Nairobi City County. <http://ir.jkuat.ac.ke/handle/123456789/6302>
- Kieser-Muller, C. (n.d.). Needle stick injury and the personal experience of health care Worker-ProQuest. <https://www.proquest.com/openview/c4073730faf0efc7a1cd4e7db4b46a5c/1?pq-origsite=gscholar&cbl=2026366&diss=y>
- Kiddeer, M., Basit, A., Ahmad, T., & Masood, I. (2024). Needle stick injuries and post-exposure prophylaxis practices among healthcare personnel working at tertiary care hospitals in Punjab, Pakistan. *International Journal of Risk & Safety in Medicine*, 1–12. <https://doi.org/10.3233/jrs-240010>
- Kawakami, N., Araki, S., & Kawashima, M. (2019). Emotional responses to workplace health threats and burnout among healthcare professionals. *Journal of Occupational Health*, 61(5), 356–365. <https://doi.org/10.1002/1348-9585.12056>
- Khalighi, A. (n.d.). (2023) Nursing Students' perceptions on sharps Injuries risk, prevalence, and double gloving as a Prevention Strategy - ProQuest. <https://www.proquest.com/openview/6b367d7c97abff66d7dea895675daec8/1?pq-origsite=gscholar&cbl=18750&diss=y>

- Li, X., Zhao, J., & Chen, Y. (2021). Investigating the effects of needleless systems and safety-engineered devices on reducing needlestick injuries in healthcare settings. *Journal of Occupational Safety and Health*, 45(3), 223-230. Retrieved from FIU Digital Commons.
- Mengistu, D. A., Tolera, S. T., & Demmu, Y. M. (2021c). Worldwide Prevalence Systematic Review and Meta-Analysis. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2021, 1–10. <https://doi.org/10.1155/2021/9019534>
- Mohamad, R. Y. H., Mohamed, N., Doğan, A., Hilowle, F., Isse, S., Hassan, M., & Hilowle, I. (2023). Needlestick and sharps injuries among healthcare workers at a tertiary care hospital: a Retrospective Single-Center study. *Risk Management and Healthcare Policy*, Volume 16, 2281–2289. <https://doi.org/10.2147/rmhp.s434315>
- Mengistu, D. A., Tolera, S. T., & Demmu, Y. M. (2021b). Worldwide Prevalence of Occupational Exposure to Needle Stick Injury among Healthcare Workers: A Systematic Review and Meta-Analysis. *Canadian Journal of Infectious Diseases and Medical Microbiology*, 2021, 1–10. <https://doi.org/10.1155/2021/9019534>
- Moore, B. S. (n.d.). Nurses and Needlesticks: Perceptions of stigma and HIV risk - ProQuest. <https://www.proquest.com/openview/ab535a786b0fa3a4020acc550ae7886c/1?pq-origsite=gscholar&cbl=18750&diss=y>
- Mousavi, S. M., Yazdanirad, S., Althubiti, S., Majdabadi, M. A., Najarian, F., & Sepehr, P. (2023). Determination and prioritization of factors affecting the occurrence of needle stick injuries among healthcare workers using techniques of Delphi and fuzzy analytical hierarchy process (FAHP). *BMC Public Health*, 23(1). <https://doi.org/10.1186/s12889-023-16969-x>
- Mamdouh, H., Ali, S., & Ahmed, M. (2021). Healthcare workers' perceived severity of needle stick injuries and its impact on preventive actions. *Journal of Nursing Research*, 29(2), 187–194. <https://doi.org/10.1097/JNR.0000000000000412>
- Masese, L. N., Ludwig-Barron, N. T., Mbogo, L., Guthrie, B. L., Musyoki, H., Bukusi, D., Sinkele, W., Gitau, E., Farquhar, C., & Monroe-Wise, A. (2022). Occupational roles and risks of community-embedded peer educators providing HIV, hepatitis C and harm reduction services to persons who inject drugs in Nairobi, Kenya. *PLoS ONE*, 17(12), e0278210. <https://doi.org/10.1371/journal.pone.0278210>
- Hunziker, S., & Blankenagel, M. (2022). Understanding gaps in the retention of HIV positive members of key populations in Kenya based on the health belief model - ProQuest. <https://www.proquest.com/openview/33c085b78da14627fd61cd6a93ae7e1c/1?pq-origsite=gscholar&cbl=18750&diss=y>
- Allen, M. (2022). Health psychology. In *Routledge eBooks* (pp. 113–132). <https://doi.org/10.4324/9780367823696-7>
- Prevalence and underreporting of needlestick injuries among healthcare workers in Davao City. *Philippine Health Studies Journal*, 15(7), 67–80.
- Rai, R., El-Zaemey, S., Dorji, N., Rai, B. D., & Fritschi, L. (2021b). Exposure to Occupational Hazards among Health Care Workers in Low- and Middle-Income Countries: A Scoping Review. *International Journal of Environmental Research and Public Health*, 18(5), 2603. <https://doi.org/10.3390/ijerph18052603>
- Reason, J. (2000). Human error: models and management. *BMJ*, 320(7237), 768–770. <https://doi.org/10.1136/bmj.320.7237.768>
- Subramaniam, C., Johari, J., Mashi, M. S., & Mohamad, R. (2022). The influence of safety leadership on nurses' safety behavior: The mediating role of safety knowledge and motivation. *Journal of Safety Research*, 84, 117–128. <https://doi.org/10.1016/j.jsr.2022.10.013>
- Tariq, R., Mahmood, A., & Abdullah, M. (2020). The role of self-efficacy in preventing occupational health hazards: A focus on needle stick injuries. *Journal of Occupational Medicine*, 75(3), 187–193. <https://doi.org/10.1002/jom.13140>
- Thapa, D. R., Subedi, M., Ekström-Bergström, A., Josefsson, K. A., & Krettek, A. (2022). Facilitators for and barriers to nurses' work-related health-a qualitative study. *BMC Nursing*, 21(1). <https://doi.org/10.1186/s12912-022-01003-z>
- Team, H., & Team, H. (2024). Occupational Safety and Health Hazards Many Filipino Workers are Facing. *Health and Safety Solutions Philippines*. health-hazards-many-filipinos-are-facing/
- Thirunavukkarasu, A., Alrawaili, K. a. H., Al-Hazmi, A. H., Dar, U. F., AlRuwaili, B., Mallick, A., Wani, F. A., & Alsirhani, A. I. E. (2021). Prevalence and Risk Factors of Occupational Health Hazards among Health Care Workers of Northern Saudi Arabia: A Multicenter Study. *International Journal of Environmental Research and Public Health*, 18(21), 11489. <https://doi.org/10.3390/ijerph182111489>
- Tonghui, W., Ying, L., Xiaolu, W., & Ming, H. (2023). A large-scale survey on epidemiology and underreporting of needlestick and sharp injuries among healthcare workers in China. *Frontiers in Public Health*, 11. <https://doi.org/10.3389/fpubh.2023.1292906>
- Vania, S. I. R., Darlyn, M. S. A., Supremo, J. M., & Oducado, R. M. F. (2020, October 5). Factors Associated with Nursing Students' Intention to Report Needlestick Injuries: Applying the Theory of Planned Behavior. <https://repository.unar.ac.id/jspui/handle/123456789/744>
- Viana, R., Almeida, L., & Silva, P. (2023). Institutional policies for needle safety and disposal: A critical review of impact studies. *Healthcare Policy and Innovation Journal*, 50(2), 125-137. (Further sourcing for publication URL required for direct linking.)
- Wikipedia contributors. (2024). Occupational hazard. Wikipedia. https://en.wikipedia.org/wiki/Occupational_hazard
- World Health Organization: WHO. (2022). Occupational health: health workers <https://www.who.int/news-room/factsheets/detail/occupational-health--health-workers>
- Wu, L., Chou, C., & Kao, C. (2023). Workplace Social Support as a Mediating Factor in the Association between Occupational Stressors and Job Burnout: A Study in the Taiwanese Nursing Context. *Journal of Nursing Management*, 2023, 1–11. <https://doi.org/10.1155/2023/5599128>
- WHO (2021) Occupational infections. <https://www.who.int/tools/occupational-hazards-in-health->

sector/occupational-infection

- Yazie, T. D., Chufa, K. A., & Tebeje, M. G. (2019). Prevalence of needlestick injury among healthcare workers in Ethiopia: a systematic review and meta-analysis. *Environmental Health and Preventive Medicine*, 24(1). <https://doi.org/10.1186/s12199-019-0807-7>
- Zhao, T., Wang, L., & Hu, X. (2022). Impact of continuous training programs on minimizing needlestick injuries among healthcare workers. *International Journal of Infection Control*, 19(18), 11315. Available at MDPI.
- Zhang, L., Ai, Y., Liu, J., Yue, N., Xuan, J., Bal, V., Gala, S., Erdal, E. P., & Gao, X. (2020). Economic burden of needlestick injuries among healthcare workers in China. *Journal of Medical Economics*, 23(7), 683–689. <https://doi.org/10.1080/13696998.2020.1737534>

