REVIEW ARTICLE

Infection Control: Knowledge and Attitude among Healthcare Workers

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ABSTRACT

Background: Infection is a significant health hazard to Healthcare Workers (HCW) globally. It exposes healthcare workers to around 20 types of blood-borne pathogen infections, particularly the most serious, including Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV). The influence of infection on healthcare workers' health, clinical responsibilities, national economic strain, and humanistic implications underscores the necessity for additional research and discourse on this subject.

Aims: This paper aimed to discuss literature on infection control knowledge and attitudes among HCWs and potential factors contributing to infection control.

Method: For this narrative review Proquest, Medline, and Up To Date have been utilized to search articles about infection control knowledge and attitudes among healthcare workers and potential factors contributing to infection control. The search was narrowed to article between 2000 and 2023. A total of 380 articles were initially identified to be potentially relevant for the review. A total of 28 articles were included, and they were found to match the inclusion criteria.

Results: Results from the reviewed studies showed that there was a high-level knowledge in terms of precautionary measures and compliance with needle safety precautions while staff attitude achieved above average. Weak positive correlation was found between staff attitude and precautionary measures, while moderate positive correlation was found between precautionary measures and compliance with needle safety precautions. Only precautionary measures were found to significantly influence compliance with needle safety precautions, in which higher precautionary measures, resulted in higher compliance with needle safety precautions.

KEYWORDS: Infection, knowledge and awareness, healthcare workers, sharps injuries

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INTRODUCTION

Hospital injuries pose a risk of acquiring Hepatitis B Virus (HBV), Hepatitis C Virus (HCV), and Human Immunodeficiency Virus (HIV) from exposure to infected blood, with estimated infection rates of 30.0%, 0.5%, and 0.3%, respectively. The World Health Organization estimates that each year, 3 million of the 35 million healthcare professionals worldwide encounter percutaneous exposure to blood-borne illnesses, comprising 2 million cases of HBV, 0.9 million cases of HCV, and 0.17 million cases of HIV. Furthermore, these disorders might impair quality of life and perhaps reduce the affected individual's life expectancy, while also resulting in substantial long-term expenses (3).

Besides health risks, numerous studies have highlighted the national economic repercussions stemming from infections (4,5). Hanmore et al. (4) identified the expenses related to infection post-exposure management, which encompassed (a) infection testing for injured healthcare workers (HCWs) and, if necessary, tracing the source to the patient, (b) post-exposure prophylaxis to reduce the risk of blood-borne virus transmission, (c) both short- and long-term treatment for HCWs infected with chronic blood-borne viruses, (d) staff absence and replacement, (e) counseling for injured workers, and (f) legal costs including litigation and compensation claims. A rigorous evaluation by Wright (6) of eight data-driven investigations and six modeling studies revealed that infections impose significant potential, intangible direct and indirect costs, which may escalate over time. Furthermore, infection has been recognized as a major factor in severe psychological or emotional distress if not properly managed, as demonstrated by extensive study. Numerous studies (6,7) highlighted the substantial psychological consequences experienced by healthcare workers after infection incidents, including depressive symptoms, increased familial tension, crying episodes, adjustment disorders, anxiety and panic attacks, along with stress-related conditions such as post-traumatic stress disorder and excessive worry. Furthermore, Gershon et al. (8) and Lee et al. (9) investigated the psychological effects on healthcare workers (HCWs) subsequent to infection events. The results indicated that 66.4% of healthcare workers experienced mild to moderate anxiety, whilst 13.8% reported chronic anxiety. Similarly, Lee et al. (9) shown that a substantial percentage (53%) of healthcare professionals reported having anxiety due to their recent exposure to infection. Moreover, Lee et al. (10) noted that the humanistic and psychological repercussions of infection led to diminished productivity and reduced work hours among healthcare professionals in the US and Europe. The research encompassed 110 US nurses who indicated a total of 77 days of lost time because to infection. Thirteen percent of these days were spent on obtaining medical care and treatment, eight percent on HIV prophylactic medicine, and seventy-nine percent on worry and mental anguish resulting from the infection. Given the potential detrimental impacts on healthcare personnel, clinical workload, and the national economy, it is imperative to assess the current incidence of infections among healthcare professionals. This project will analyze factors contributing to infection to give recommendations for improving the quality of life for healthcare workers globally.

MATERIALS AND METHODS

This review aims to examine the pertinent literature regarding infection control knowledge and attitudes among healthcare workers, as well as the potential factors influencing infection control practices. The literature was examined using Pubmed, Scopus, and web of science. The inquiry was confined to papers published between 2000 and 2024. The search terms included “infection control knowledge,” “attitudes of healthcare providers toward infection control,” and “potential factors contributing to infection control,” yielding 400 results. Upon including the inclusion criteria, the total text amounted to 216. Precisely 103 were included following the review of the titles. A total of 766 studies were included following the review of the abstract.

Eventually, after revieving the full texts 28 articles were included based on the quality of the studies. Quality appraisal developed by DiCenso et al. (11) was utilized to evaluate the quality of the studies. Questions were on research problems, literature review research design, study sample, data collection, results, and limitation. The review was aimed to find answers to the following questions. What is the infection control knowledge and attitudes among HCWs? And what are the potential factors contributing to infection control?

DISCUSSION

The prevention and eradication of infection is not a national concern, but a global necessity. Infection presents a significant problem to healthcare providers globally, mostly due to the associated dangers and their repercussions. Despite evidence indicating that these hazards can be easily prevented, minimized, and even eliminated, their prevalence is becoming common and significant. The most recent evaluation has revealed that the existing understanding of infections among healthcare providers is inadequate and deficient(12). This knowledge gap necessitates the acquisition of reliable and generalizable empirical evidence, hence validating the proposed research initiative. Presently, there is a lack of research that focuses on the prevalence and under-reporting of infections, along with the related risk factors and preventive strategies via educational initiatives. The examination of infection knowledge and attitudes among healthcare workers (HCWs) is divided into the following domains: HCW safety protocols, HCW knowledge gaps, HCW attitudes about infection control, preventive measures, and compliance with needle stick and sharps injury safety guidelines.

Safety Measures

Numerous research have been undertaken regarding the infection control safety measures for healthcare workers. A study (13) examined the occupational risk factors for infection among Ethiopian healthcare workers in Hawassa City, emphasizing that injuries pose a substantial issue within Ethiopian healthcare systems due to the associated risk of contracting hepatitis C, hepatitis B, and HIV infections. It also emphasized the necessity of safety protocols for healthcare workers who are at risk of infection, and in credible research findings. The presence, frequency, significance, and impact of infections among healthcare workers have been recognized as a pressing global issue that may and should be mitigated, eradicated, and even prevented. The implementation of safety measures is necessary, as infections pose significant threats that can endanger the working conditions of healthcare personnel. In addition to the implementation of protective equipment and a proactive attitude towards healthcare, another beneficial safety strategy, corroborated by prior empirical research, is the utilization of safe devices (needles and sharps) (14,15).

Lack of Knowledge of Healthcare Workers

The deficiency in knowledge and awareness of infection control among healthcare workers, as shown in the literature, has been associated with the deterioration of healthcare delivery outcomes (16).

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A mini-systematic literature review on infection control contended that the risks observed in Saudi Arabia and worldwide stemmed from insufficient information regarding infection prevention in healthcare delivery. The insufficiency of current understanding regarding dangers in Saudi Arabia has been demonstrated by numerous researchers (16,17). Immunization, education of healthcare providers, and engineering control techniques are all recommended examples of infection prevention and control (17). Healthcare workers frequently neglect to report injuries to hospital administration to obtain suitable treatment. Research indicates that healthcare workers frequently neglect to report needlestick and sharps injuries due to insufficient knowledge on the effectiveness of Post-Exposure Prophylaxis for prevention; also, some healthcare workers exhibit a lack of follow-up and demonstrate negligent attitudes. Such attitudes among healthcare workers contribute to the frequency and incidence of injuries, which have been associated in the literature with their insufficient awareness of the risks, repercussions, and prevention of infections. This study revealed that healthcare workers lacked information regarding the nature, consequences, and prevention of infections. Therefore, it is essential to maintain ongoing awareness, training, and education of healthcare workers to proactively report and avoid needle stick injuries. Additionally, a previous research has indicated that the risk level of HCWs to increase, ignore and inadequately respond to needle stick and sharps injuries is primarily determined by their knowledge, competence and experience (18). This knowledge entails the appropriate utilization of equipment in relevant situations, comprehension of the healthcare facility's policy protocols for injury prevention and response, awareness of institutional guidelines regarding equipment usage, and adherence to disposal protocols and procedures for used equipment.

Attitudes of Healthcare Workers toward Infection Control

Numerous research studies have correlated staff attitudes with the incidence, prevalence, and consequences of infections among healthcare workers in a facility. Hashmi et al. (18) attributed the infection prevention failures and inadequate post-injury responses to needle stick injuries to the negligent and indifferent behavior of healthcare workers. A recent study by Hashmi et al. (18) contended that the occurrence of needle stick and sharps injuries among healthcare workers in Najran, Saudi Arabia, might be partially attributed to the carefree and uninformed attitudes of the personnel. Healthcare workers and hospital personnel encounter elevated hazards owing to their insufficient experience in clinical practices. Medical personnel must possess knowledge about needle stick hazards and best practices to effectively fulfill their future responsibilities(19). Consequently, it is crucial for them to acquire knowledge on safeguarding themselves from work dangers, including infections. Infection is prevalent among medical personnel; thus, obtaining knowledge and adopting a professional demeanor helps enhance safety. This mentality is discernible not just among practicing healthcare workers. Another study identified same casual and uninformed attitude among nursing trainees. Fashafsheh et al. (20) assert that the risks associated with needle stick and sharps injuries are substantial not only for practicing healthcare professionals but also commence during their initial training. Fashafsheh et al. (20) assert that a negligent and nonchalant disposition among healthcare workers contributes to a rise in the frequency and incidence of needle stick and sharps injuries, despite the considerable risks and repercussions these injuries typically entail. The uneducated and casual attitude is among the "factors influencing the career aspirations of medical students in Mangalore, India," which is debatable.

Precautionary Measures

Fashafsheh et al. (20) assert that analyzing data on needle and sharp injuries in hospitals to ascertain the distribution of healthcare workers' illness burden, categorized by ward or activity, would enable more precise targeting of prevention strategies. Consequently, optimal preventive measures must be formulated and integrated to address the distinct circumstances of a particular healthcare facility. Khraisat et al. (21) created an evidence-based module to instruct practicing nurses on needle stick safety and prevention. Literature examined several practical methods to establish a safe workplace culture, during which they determined the principal causes of severe injuries.

Al-Ghamdi and Kabbash (22) conducted a study in Saudi Arabian hospitals during the Hajj season, revealing that maintaining preventative measures is challenging due to healthcare workers' limited expertise and the absence of adequate guidelines. Nawafleh et al. (15) consequently advised that these reasons delineate the preventative actions that healthcare workers, especially practicing nurses, should use to avert needle and sharp injuries. The researchers introduced the Hierarchy of Controls, which assists in preventing and effectively addressing such accidents, comprising five separate levels of control ranked from most to least effective, specifically:Mitigation of risks: By replacing superfluous injections with alternatives like inhalers, pills, and patches, or by avoiding the use of needles and sharps in patient interventions.Engineering controls: Employing strategic devices and needles that are designed for optimal accuracy, including retractable needles, sheathed instruments, and blunt devices.

Administrative controls: Formulating, executing, and enforcing policies that mitigate exposure to hazards, ensuring appropriate resource allocation, monitoring the safety of healthcare personnel, establishing a needle stick prevention committee, maintaining an operational exposure control plan, and endorsing, facilitating, and mandating ongoing training and awareness.

Operational safety measures: Implementing correct and suitable working protocols, including the avoidance of re-capping, adherence to optimal disposal procedures, positioning needles and sharp containers within arm's reach and at eye level, and enforcing strategic safe handling of all clinical instruments.

Control of personal protective equipment: Ensuring that employees are provided with sufficient gear to serve as preventatives, barriers, and filters against injuries, including gowns, eye goggles, gloves, face shields, and masks.

Compliance of Needle Stick and Sharps Injury Safety

In their WHO-funded study, Prüss-Üstün et al. (14) compared the dangers of needle and sharps injuries to a growing and nearly catastrophic disease load among healthcare workers worldwide, notably emphasizing illnesses such as HBV, HCV, and HIV. As previously stated, Shiao et al. (23) indicate that a needle stick injury is defined not only by the trauma but also by the percutaneous exposure to a patient's blood and bodily fluids, which may transmit infectious diseases. Consequently, Makary et al. (24) and numerous other experts highlight poor health, acute and chronic diseases, infections, and mortality risk as the most foreseeable dangers resulting from needlestick and sharps injuries.

Furthermore, it contended that, according to clinical severity, health problems, and mortality, needle stick and sharps injuries among healthcare workers represent the most devastating conditions. The blood-borne pathogens include HBV, HCV, and HIV, specifically Hepatitis B, Hepatitis C, and the HIV/AIDS virus. The aforementioned findings align with those published by WHO and Azadi et al. (25).

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Prüss-Üstün et al. (14) report that sharps injuries among healthcare workers have resulted in 1,000 cases of HIV, 16,000 cases of Hepatitis C, and 66,000 cases of Hepatitis B. The prevalence of HCV among healthcare workers is 39%, HBV is 37%, and HIV is 4.4%. Needle stick and sharps injuries provide hazards that jeopardize the safety of healthcare workers, encompassing risks from infections to potentially deadly outcomes (26). These dangers have been verified worldwide. In the early part of the last decade, Poznansky et al. (27) performed an empirical investigation to assess the risk of blood-borne infections to healthcare workers following needle stick injuries in Taiwan. The authors of the research study emphasized the dangers associated with the transfer of blood-borne viruses following needle stick injuries.

In light of this risk, researchers proposed a novel strategic intervention to mitigate HIV infections among healthcare professionals throughout Britain (27). The Commission, following an empirical survey of the highest HIV prevalence in Africa at that time, recommended that the country revise its legal framework to mitigate the increasing risk of AIDS infections among healthcare service providers, as per the Law Relating to AIDS (12). The panel noted that needle stick and sharps injuries in South Africa posed significant risks of HIV infections among healthcare workers. Wicker et al. (28) reported analogous findings in Germany regarding needle stick injuries among healthcare workers in a university hospital, confirming that blood-borne pathogens responsible for Hepatitis B, Hepatitis C, and HIV infections constituted the primary risks associated with needle stick and sharps injuries, in addition to stab, scratch, cut, or other bloody injuries. Germany, akin to numerous other industrialized nations, is confronting the hazards associated with needle stick and sharps injuries, which have escalated into a significant worry, as previously noted.

This narrative review possesses numerous limitations that may affect the generalizability of the findings. The review primarily included observational cross-sectional studies evaluating healthcare workers' knowledge and attitudes on infection control practices. This review is susceptible to social desirability bias, perhaps resulting in the overestimation or underestimate of the study findings. Adherence to infection control protocols must be paramount in healthcare. Healthcare workers must possess a substantial level of knowledge and adherence to hand hygiene to reduce the transmission of infection. The ongoing education and training of staff are crucial for enhancing healthcare workers' understanding of infection and their preventive procedures. Future research should employ more robust interventional and non-interventional designs to assess healthcare providers' knowledge and attitudes toward infection control, as well as the actual incidence of needle stick injuries and hospital-acquired infections resulting from inadequate infection prevention measures.

CONCLUSION

The present study has identified a substantial association between staff attitudes and precautionary measures, indicating that these measures influence staff adherence to needle safety protocols. The knowledge levels shown considerable variations in the interactions among healthcare workers, based on the current findings of staff knowledge, attitudes, precautionary measures, and adherence to needle safety protocols. Engineering and the implementation of elimination or substitution controls are strongly recommended for effective infection control and prevention.

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