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Risk factors and prevention of needlestick instruments in the medical field

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***Abstract*---**Training is believed to be most effective when incorporated into healthcare workers' ongoing training regimen, allowing for new technologies to be showcased and for workers to be trained more than once since information retention decreases dramatically after a year. Cutting-edge ways of engaging healthcare workers are being developed to make the information easier to learn and maintain. In some simulations, scenarios can be used to demonstrate real-life situations. In the final analysis, developing properly trained healthcare workers is as important as legal mandates, especially if healthcare leadership is geared towards the novel one-stop shop approach. Workers themselves have stated the desire for employers to take the time and effort to keep them safe. Efficiently training healthcare workers to properly use needlestick preventative equipment is one of the most cost-effective means of reducing not only the risk but also the cost associated with needlestick injuries as well.

***Keywords*---**needlestick, healthcare workers, training and education.

1. Introduction to Needlestick Injuries

Needlestick injuries refer to instances where healthcare workers experience puncture wounds or cuts due to medical instruments, most commonly needles. Needlestick injuries carry the risk of infectious disease transmission ranging from bacterial infections to viruses associated with conditions like HIV/AIDS, chronic hepatitis, and more. Healthcare professionals are at high risk for experiencing needlestick injuries, with some highly affected specialties including nurses, anesthesiologists, and surgeons. Injuries can have a substantial impact on professionals, leading to negative emotional states, anxiety, and depression, as well as physical injuries such as localized discomfort and pain and potential permanent damage. The impact on healthcare professionals more broadly can influence not only personal well-being but also increase rates of absenteeism and

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injury claims, all of which can have financial implications for healthcare institutions. Furthermore, the transmission risk for causing secondary infections in patients is another reason that addressing needlestick injuries is included as an infection control guideline. (Alfulayw et al., 2019)(Suksatan et al. 2019)(Abadiga et al. 2019)

In terms of policy, the general duty clause included in the U.S. Occupational Safety and Health Act requires employers to provide a safe workplace and may be cited in cases of needlestick injuries where employers have not supplied proper protective equipment or preventive measures. Regulatory standards also make reference to protection against needlestick injuries, including the Needlestick Safety and Prevention Act. Various other documents and guidelines exist to address how to minimize and investigate needlestick injuries in the healthcare industry. To move the needle on reducing the burden of needlestick injuries, this section reviews available literature to characterize the extent to which various risk factors may be associated with needlestick injuries and to present available evidence on measures to prevent needlestick injuries among healthcare professionals.

2. Risk Factors Associated with Needlestick Injuries

There are multiple risk factors associated with sustaining a needlestick injury in an occupational setting, and they have been classified as intrinsic or extrinsic variables. Intrinsic factors include the type of health care procedure performed by the health care worker, the care setting in which health care is provided, the priorities each business unit and staff adopt when implementing infection control in the workplace, as well as individual behavior. Apparent factors in the extrinsic category include the safety of the equipment and the sharpness and design of medical devices. This began the process of identifying the impact on patients and the system of work-related needlestick injuries. Therefore, an orthopedic focus has been incorporated here.

What these considerations illuminate is the definitive data for nurses who usually sustain these injuries, as documented and supported appropriately by prevalence rates concerning professional groups who frequently sustain needlestick injuries. This supports the ‘risk landscape’ for occupants in workplaces such as hospitals, whereby nurses and nursing personnel experience numerous needlestick injuries. Effectively, organizational influences appear to steer the risk of needlestick injury to create the risks that persist in nursing practice. Research on needlestick injuries to date has focused on developing profiles, measuring the number and magnitude of incidents, and the inherent risks measured within certain procedures and departments. The account explains how we currently understand the risks. Comparatively, this research scope includes organizational risk absorbers in order to influence the exploration of existing management processes in place and to consider different levels of scope that publicly exist in organizations. Two systematic reviews identify behavior and practice as wrong, risky, or in need of revision, where two ‘profiles’ of the characteristics of health workers linked to the continuing incidence of needlestick injuries are presented. It is the intention of this research enterpr‘se to au’ment our current knowledge base in this way.

3. Prevention Strategies for Needlestick Injuries

About 80% of NSIs are avoidable through applying best practices in prevention. Several methods are applied to decrease the NSI incidence rate, including the use of safety-engineered devices able to prevent the injury of an NSI or the creation of a protective barrier between the sharp device and the healthcare provider. Nurses and practitioners should make sure to activate the devices as soon as possible after completing the procedure and before removing the sharp object. Appropriate supervision is also required to ensure workers comply with the recommendations. It is important to promote a safety culture in work environments where the reporting of NSI incidents is easily accessible and fear-free. Simulating the procedure to improve the safety of the devices will make the staff more cautious. It is important to ensure that safety drills and similar knowledge-sharing sessions are held on a regular basis in order to maintain the effectiveness of the measures adopted and improve knowledge of results. Collaborative efforts for adoption can also be useful in decreasing the incidence of NSIs among healthcare workers using the same class of safety devices. Sticking injuries are also a problem in other sectors. Prevention methods include setting up protocols and standard operating procedures to train workers properly and prevent NSIs by using devices and materials equipped to generate a protective barrier between the user and the sharp objects. Needles and other incriminated items should be integrated with the general rules set out under risk assessment. It should be remembered that in order to decrease episodes of NSIs, the general procedures for the correct handling and disposal of needles and sharps should be thoroughly observed. Studies solely dealing with the appropriate disposal methods were not considered in the weak or disagreed considerations. They were dealt with as much as they were part of a more comprehensive problem involving the prevention of NSIs. (Sharma & Choudhary)(Moyo, 2019)(Obaidoon et al. 2019)

4. Technological Advances in Needlestick Prevention

In the past, lots of technological advances have been developed towards preventing needlestick injuries in healthcare settings, including safety needles, retractable syringes, and needleless systems. Advances, especially over the past decade, have greatly accelerated the development of safety devices. Safety needle technology is continually being improved, and new development projects are underway to find new design solutions to further reduce the risk of needlestick injuries. Case studies show new safety devices are effective and easy to use, and that they are installed in healthcare facilities with an associated reduction in needlestick injury rates. Since the 1980s, numerous voluntary standards and regulations have been implemented, endorsing the use of advanced safety-designed devices to reduce the risk of exposure to healthcare workers. The use of safety-designed devices, particularly if backed up by education and appropriate work practices, is consistent with current notions of risk management as adopted in workplace health and safety codes. The technologically improved safety devices that have been developed, and the ongoing development of new devices or improvements, make our workplaces safer. New technologies designed to protect workers from the risk of needlestick injuries are expensive – the implementation of safety technology can add between 2% and 10% to the total cost of needle and syringe usage. The implementation of new technology can also lead to an

expansion in the cost of needle and syringe use, as non-safety products are displaced in favor of safer products, and as non-safety alternatives are forgone. The needle and syringe market is growing and continues to be characterized by technological change. Thus, in the future, we can expect to see many new products and alternatives on the market. The development of new and improved needles and syringes is the focus of much international research and development effort. The primary concern of new products is for them to work as well as or better than existing technology and to cost no more, with no other side effects.

5. Training and Education for Healthcare Workers

Many manufacturers have stressed the importance of properly training healthcare workers in the use of safety-engineered medical devices. Some manufacturers have developed their own training materials, in some cases complete with video training modules. This educational effort aimed at healthcare workers is not surprising. In fact, obtaining the continued use of safety products may indeed be linked to effective education. Smaller, poorly publicized, and less comprehensive hospital-based training programs generally cover material as part of a broader bloodborne pathogen or safety training program. Needlestick education and training should consist of a comprehensive approach to detail safe practices of both handling and disposing of needles in addition to what workers should do if exposed. (Jackson et al. 2019)(Dulon et al. 2019)

Considering how critical proper disposal is in any educational endeavor, it is likely that any healthcare worker education program that advertises drill and practice offerings will typically include training in needlestick disposal. How long the training may take, or at what frequency it may need to be taught, is another confounding issue. Training is believed to be most effective when incorporated into healthcare workers' ongoing training regimen, allowing for new technologies to be showcased and for workers to be trained more than once since information retention decreases dramatically after a year. Cutting-edge ways of engaging healthcare workers are being developed to make the information easier to learn and maintain. In some simulations, scenarios can be used to demonstrate real-life situations. In the final analysis, developing properly trained healthcare workers is as important as legal mandates, especially if healthcare leadership is geared towards the novel one-stop shop approach. Workers themselves have stated the desire for employers to take the time and effort to keep them safe. Efficiently training healthcare workers to properly use needlestick preventative equipment is one of the most cost-effective means of reducing not only the risk but also the cost associated with needlestick injuries as well.

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