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The Role of Community Health Nurses in Promoting Occupational Health and Safety Awareness within Facilities by Embracing Modern Distance Learning Techniques

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Abstract: Overall, accessibility, engagement, and cost-effectiveness can all be significantly impacted by the use of remote learning for occupational health and safety training. In order to make significant progress toward raising occupational health and safety awareness within facilities, it is critical to deal with any potential roadblocks and implement plans that will optimize its effectiveness. Using remote learning for occupational health and safety training of facility staff presents both potential benefits and challenges with regard to raising safety awareness and improving occupational health. Community health nurses play a critical role in improving health and wellness in local communities (CHNs). Workplace health and safety is another area where this is pertinent, particularly for smaller businesses located in impoverished areas where access to occupational health professionals may be limited. By utilizing contemporary remote learning technology, CHNs can serve as effective advocates for and teachers of personnel on critical safety procedures. Thus, the purpose of this study was to examine the role of community health nurses in promoting occupational health and safety awareness within facilities by embracing modern distance learning techniques.

Keywords: Occupational health, safety, awareness, modern methods.

Review Paper

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INTRODUCTION

According to the report, work-related accidents are responsible for an additional 330,000 deaths. Cardiovascular disorders, respiratory conditions, and malignant neoplasms are the top three work-related causes of death. Together, these three categories represent over 75% of all fatalities related to the workplace. Manufacturing, forestry, construction, and agriculture are the riskiest industries. These cause 200,000 fatal injuries every year, or 63% of all fatal occupational injuries (Konijn et al., 2018; International Labour Organization, 2023).

Studies on occupational exposures in the wood sector and other industries have indicated that there is a significant risk of acquiring lower respiratory diseases, allergies, cancer, and lung diseases for workers in sawmills, lumber mills, plywood and particle board factories, and veneer plants. The negative health impacts of wood processing byproducts such wood dust, mold, formaldehyde, and noise are widely established. Despite being exposed to a variety of hazardous substances, including dusts, fumes, and toxic chemicals, as well as biological and physical hazards like parasites and acute and chronic infections, workers in this industry have limited knowledge about occupational safety and health (OSH), which results in low compliance with safety procedures (Akuoko et al., 2013). Many industrialized and developing nations have developed occupational safety and health (OSH) programs for workers because safe behavior lowers the costs of workplace accidents and their detrimental effects (Burke et al., 2006). These programs have guidelines and requirements that all employees must follow while at work. Occupational safety and health's mission is to create a safe working environment for all workers, clients, vendors, guests, neighbors, and anybody else who might be impacted by the workplace (Al-Rawajfeh and Tarawneh, 2020).

The field of study known as occupational safety and health science is characterized by its emphasis on protecting human safety and health by establishing secure working conditions devoid of elements that can cause illnesses or accidents at work. By addressing the technological or individual variables that may contribute to these hazards, it also seeks to

safeguard employees from a range of work-related conditions or risks. Enhancing these elements will support preserving the physical and emotional health of employees. In addition, occupational safety and health is described as a set of rules, regulations, and laws that are governed by a legal framework and are meant to keep people safe, prevent property from being lost or damaged, and protect the environment. The field of occupational health and safety, according to the ILO, deals with both the prevention of diseases and injuries connected to the workplace as well as worker protection and promotion. Its objective is to improve working conditions and the surrounding environment. Additionally, it is seen as a transdisciplinary field that addresses the protection of the welfare, health, and safety of persons who work or are employed. Since 1950, the World Health Organization (WHO) and the International Labor Office (ILO) have set the following goals for occupational health:

- Assigning the employee a task that corresponds with his physical and mental capacities to foster a positive working relationship.
- Protecting the worker from hazards caused by factors harmful to his health while he is at work.
- Ensure that the worker's working conditions do not result in the loss of his health benefits.
- Maintain the best possible levels of social, psychological, and physical wellness among staff members in all areas of the business (Kirch, 2008; Al-Rawajfeh and Tarawneh, 2020).

The industrial sector accounted for 6,501 cases, or 56.5%, of all occupational injuries in Egypt in 2020, according to The Central Agency for Public Mobilization and Statistics (CAPMAS); health and social services accounted for 946 cases, or 8.2%, of all injuries. Employees in home services reported the fewest job injuries, with 3 incidents at 0.3% These incidents are inevitable in a workplace that does not adhere to the basic standards of occupational safety and health in order to protect humans, which is the primary driver of economic growth and prosperity (Central Agency for Public Mobilization and Statistics (CAPMAS), 2021).

Maintaining a healthy work environment requires management and employee representatives to collaborate in the area of occupational safety and health. It might additionally aid in the creation and upkeep of a positive social climate and the accomplishment of broader goals. All management levels should have the authority to ensure safe operation, even if senior management is ultimately responsible for the enterprise's safety and health program. Given their regular interaction with the employees, supervisors are undoubtedly the most important participants in such a program. In their function as safety officers, they assist in the administration of safety policies, offer technical knowledge, support training, and provide program materials (Alli, 2008).

The type of hazardous situation and the incident's location define the occupational and environmental health nurse's responsibilities. Two essential components of a good all-hazard readiness program are finishing up workplace and community monitoring and connecting with all pertinent organizational and community response resources. They should be ready to handle a variety of situations both before and during an emergency. They should use their understanding of the workplace to evaluate and include risks related to people, technology, and natural disasters when creating all-hazard plans for emergency preparedness in the workplace. They will oversee the creation of a response strategy, choice of response options, and initial assessment of the threat during an incident in collaboration with other specialists. They are essential in helping workers overcome their trauma and resume productive lives by providing information and connections to local resources when it comes to diagnosing and treating delayed reactions to risks. Furthermore, occupational and environmental health nurses are essential in improving future responses through data analysis and ongoing community planning (American Association of Occupational Health Nurses (AAOHN), 2013).

The COVID-19 pandemic is changing our lifestyle and posing a number of problems for contemporary culture. It was a worldwide economic disaster in addition to a health one. Layoffs, company closures, and unexpected job losses happened to a lot of people. COVID-19-related extremely dangerous conditions are affecting people's daily lives, culture, economy, and health. The accessible learning approach during this epidemic is distant learning (DL), which attempts to address the issues presented by COVID cases worldwide. Distance education is the term used to describe a situation in which a learner or learners and an instructor are physically separated and the only means of instruction are print materials and/or technology gadgets. various useful benefits of DL, like time and money savings. The cost of online education is typically substantially less than that of traditional on-campus classes. The learner can set their own schedule within the constraints set by the instructors because DL can be learner-centered. Furthermore, learning can occur whenever and wherever. As long as there is an internet connection, one can learn online from wherever, even at home in cozy clothes or in a remote area. Additionally, documents and other online resources can be updated instantly thanks to technology. Learner can get online support to get their questions answered (Knebel, 2001; Nolasco, 2022).

However, distractions are unavoidable because learners are not in a traditional classroom setting but rather in the comfort of their own homes. Research indicates that distance learning students may face a variety of challenges, including expensive hardware and software, the need to keep online learning environments isolated from traditional classroom settings, unprepared teachers, difficulties controlling their screen time, and subpar internet connections that lower the quality of instruction. The epidemic and the mandate that all students possess digital literacy led to an assessment of internet connection quality. Regretfully, not every learner has steady access to the internet. Intermittent connectivity can also lead to inadequate online learning. This could have a detrimental effect on how things are taught and learned. Lack of resources required for the meaningful development and maintenance of technology-based learning, as well as the absence of infrastructures (such as information and communication hardware systems) in least developed and/or low-technology nations, are barriers unique to the developing world (Knebel, 2001; Nolasco, 2022).

The use of distance-learning in occupational health and safety training for facility personnel holds both potential benefits and challenges in terms of raising safety awareness and improving occupational health. Here's a breakdown of the possibilities:

Potential Benefits:

- Increased accessibility and reach: Distance-learning methods like online courses, webinars, and virtual reality simulations can reach a wider audience, including geographically dispersed staff and those with busy schedules. This can be particularly beneficial for facilities with limited training resources or in remote locations.
- Improve engagement and interaction: Modern distance learning tools use multimedia elements, games and interactive exercises, making the learning process more engaging and effective compared to traditional classroom lectures. This can lead to better knowledge retention and application of safety procedures.
- Cost-effectiveness: Distance-learning can be more cost-efficient than traditional classroom training, as it eliminates travel expenses, instructor fees, and venue rentals. Additionally, online courses can be easily updated and scaled, further reducing costs.
- Standardization of training: Distance-learning platforms allow for consistent delivery of training materials across different locations and departments, ensuring everyone receives the same essential safety information.
- Data-driven insights: Online platforms can track learner progress and engagement, providing valuable data to identify areas for improvement in training programs and assess their effectiveness in improving safety outcomes.

Potential Challenges:

- Technology barriers: Some workers may have limited access to technology or lack the necessary digital skills to participate in online training. This can create a knowledge gap and hinder training effectiveness.
- Lack of hands-on practice: Certain safety procedures and equipment operation may require hands-on practice, which can be difficult to replicate in a virtual environment. This can compromise the effectiveness of training for specific tasks.
- Reduced engagement and motivation: Online learning may lead to decreased motivation and attention compared to face-to-face instruction, especially for individuals who require more personalized guidance or interaction.
- Cybersecurity concerns: Ensuring secure access to training materials and protecting sensitive information is crucial with online platforms.

RECOMMENDATIONS

- Hybrid approach: Combining distance-learning with in-person sessions can combine the benefits of both methods, addressing the need for both theoretical knowledge and practical skills.
- Tailored training programs: Develop training programs that cater to the specific needs and learning styles of different employee groups, addressing technology access and hands-on training requirements.
- Interactive platform design: Utilize engaging multimedia elements, simulations, and interactive exercises to promote active learning and knowledge retention.
- Support and guidance: Provide technical support and training to help employees navigate the online platforms and maximize their learning experience.
- Effective assessment: Use a variety of assessment methods to gauge knowledge retention and skill development, ensuring the training program is achieving its goals.

It is necessary to have preparedness in DL in order to avoid these issues. The administration, the instructors and learners of the institution must all be prepared. Many distance education students report general levels of satisfaction and indicate they would take distance education courses again when compared to similar educational experiences in the on campus classroom (Nolasco, 2022). Distance education programs need enrollment in an educational institution

that offers lesson materials produced in a logical and sequential order for students to study independently. Facilitators or trained teachers review, evaluate, comment on, and provide feedback on the assigned work after each class. Programs for distance learning are delivered using three approaches, all of which are centered on the needs of the learner as well as the context of culture and resources. Each distance education model addresses some or all of these issues with a different technology.

- **Distributed Classroom:** The experience is comparable to being in a classroom for both the instructor and the learner because classrooms require regular attendance by the instructors and the learners at specified locations at specific times. A class given in a classroom can be expanded to include students from one or more additional locations by using interactive telecommunications technologies. Every learner gets the opportunity to talk with the instructor and with each other during class. Both in-person and remote learners may be able to visually interact with the instructor and other learners in the classroom, depending on the technology being used.
- **Independent Learning:** With a thorough syllabus at their disposal, learners can study at their own speed and communicate with instructors via a variety of technological means. In addition to course materials, learners get access to an instructor who guides them, responds to inquiries, and assesses their work. The amount of communication that learners start with their instructors varies greatly. Interactive conversations can take place when computer conferencing and/or email are available.
- **Open Learning + Class:** With this model, learners can study at their own pace using a combination of printed guides and other media (like computer disks or videotapes), with sporadic use of interactive telecommunications technologies or trips to designated locations for group meetings with an instructor or facilitator for all enrolled learners. Problem resolution is a common use case for these meetings (Knebel, 2001).

Businesses, employees, their families, and communities all suffer significant and frequently protracted physical, psychological, and financial consequences as a result of occupational diseases and injuries. Public health researchers, practitioners, and healthcare providers must make a concentrated, ongoing effort to investigate the personal and occupational risk factors that lead to poor health in the health care workforce due to the ongoing burden of work-related morbidity and mortality. The artificial boundary separating "work life" from "home life" has become increasingly hazy, and illnesses and injuries suffered by workers in all industries—including health care—are caused by both personal and occupational risk factors, according to a growing number of public health researchers, practitioners, and medical professionals (Guerin and Sleet, 2020).

Community health nurses play a crucial role in raising safety awareness and promoting occupational health within various "facilities," depending on the specific context. Here's how they contribute:

1. Awareness and Education:

- Conducting workshops and training sessions: Community health nurses can educate facility staff on safety protocols, hazard identification, and risk prevention strategies relevant to their workplace. This could include training on ergonomic practices, handling hazardous materials, preventing slips and falls, or using personal protective equipment.
- Developing and distributing educational materials: They can create pamphlets, posters, and infographics on safety topics, tailored to the specific needs and risks of the facility. This ensures ongoing access to information and reinforces key safety messages.
- Facilitating group discussions and forums: Creating opportunities for open dialogue and knowledge sharing allows staff to raise concerns, address specific issues, and learn from each other's experiences. This fosters a culture of safety within the facility.

2. Assessment and Surveillance:

- Conducting workplace safety assessments: Community health nurses can systematically evaluate a facility's environment, procedures, and equipment to identify potential hazards and assess the overall safety culture. This data helps inform targeted interventions and improvements.
- Monitoring injury and illness incidents: Tracking trends in workplace injuries and illnesses helps identify areas where safety measures need to be strengthened. Community health nurses can analyze these trends and recommend appropriate preventive measures.
- Collaborating with management: They can work with facility management to implement safety recommendations, develop safety policies, and ensure compliance with occupational health regulations.

3. Advocacy and Support:

- Educating workers on their rights and responsibilities: Community health nurses can empower workers to raise safety concerns without fear of reprisal, understand their rights regarding safe working conditions, and participate in safety decision-making processes.

- Providing individual counseling and support: They can offer support to workers who have experienced workplace injuries or illnesses, connect them with relevant resources, and help them advocate for their needs.
- Promoting healthy lifestyles: Community health nurses can also promote healthy habits among facility workers, including stress management, physical activity, and healthy eating, which can contribute to overall well-being and reduce the risk of occupational health problems.

Community health nurses manage a wide range of duties and responsibilities in their work, including direct patient care, management, administration, consultation, education, and research in many contexts. Community health nurses may serve a number of roles and engage in diverse activities connected to occupational health and facility safety, depending on the type of facility (e.g., industries, schools, healthcare facilities), local legislation, and the specific requirements of the community (Ward *et al*., 2011). Enhancing workers' occupational health and safety (OHS) competencies and preventing work-related diseases and injuries require OHS training. Training is another essential component of organizational OHS management systems. It's crucial to keep in mind that workplace training effectiveness is determined by training transfer, or the application of newly acquired knowledge, skills, and abilities to performance when employees return to work after training (Pham *et al*., 2023).

Programs for occupational health and safety (OHS) must be effective if workers apply the knowledge, skills, and abilities they have gained from OHS training to their post-training performance in the workplace. Numerous research concentrate on extrinsic variables that influence training transfer that are related to the work environment (e.g., social support) or the content and delivery of training courses (e.g., training design). Apart from external factors, training transfer can also be significantly predicted by individual-level characteristics. Viewing training transfer as a human choice or decision-making process, it is recommended that trainees' transfer intents be taken into account when investigating the phenomenon of training transfer. Intention to transfer is defined as "an endpoint of the motivational process that encompasses his or her motivation to transfer," denoting an individual's decision to use knowledge and skills they have gained. Studies show that people's intentions—referred to as transfer intentions—about using newly acquired knowledge, skills, and talents are a good indicator of their transfer behavior (Pham *et al*., 2023).

By applying the following strategies, CHNs can leverage the power of technology to make a significant difference in the lives of workers and strengthen the overall health and safety culture within their communities:

Content Creation and Delivery:

- Develop online modules: Create engaging e-learning modules covering various occupational hazards, risk assessment, prevention strategies, emergency preparedness, and relevant regulations. Platforms like Moodle or Google Classroom can be utilized for accessibility.
- Utilize interactive tools: Incorporate multimedia elements like videos, infographics, quizzes, and simulations to enhance engagement and knowledge retention. Gamification can also be explored to promote a competitive learning environment.
- Live webinars and Q&A sessions: Host live webinars on specific topics facilitated by CHNs or invited experts. This allows for real-time interaction and clarification of doubts. Regular Q&A sessions can address emerging concerns and provide ongoing support.

Tailored Training Based on Facility Needs:

- Conduct needs assessments: Collaborate with facility management to understand specific risks and hazard profiles of their operations. This helps tailor training content to address their actual needs and workplace realities.
- Target different worker groups: Develop separate modules for various job roles with specific safety concerns, ensuring the information is relevant and actionable for each group.
- Microlearning for busy schedules: Break down training into bite-sized modules that can be easily accessed and completed in short bursts during busy work schedules.

Accessibility and Outreach:

- Utilize mobile technology: Make training modules accessible through mobile apps or platforms, encouraging participation through on-the-go learning. This cater to geographically dispersed workforces or those with limited internet access at work.
- Offer offline options: Provide downloadable materials or offline versions of modules for situations with limited internet connectivity.
- Partnerships with local resources: Collaborate with relevant government agencies, NGOs, or occupational health specialists to share resources and expertise, broadening the reach and impact of training programs.

Measuring Impact and Continuous Improvement:

- Track completion rates and engagement metrics: Monitor how workers are interacting

with the training materials to identify areas for improvement.

- Conduct post-training assessments: Evaluate the effectiveness of the training through knowledge tests, safety audits, or incident reports to track any behavioral changes or improvements in safety practices.
- Regular updates and revision: Regularly update training materials to reflect changes in regulations, emerging risks, or technological advancements.
- By embracing modern distance learning techniques, CHNs can become powerful advocates for occupational health and safety in their communities. Their unique role allows them to bridge the gap between healthcare and workplaces, ensuring a safer and healthier working environment for all.

Additional Points:

- Cultural sensitivity: Consider the cultural backgrounds and languages of workers when developing training materials to ensure inclusivity and accessibility.
- Sustainability: Implement strategies to ensure long-term engagement with the training programs, such as incorporating incentives or follow-up sessions.
- Evaluation and research: Conduct research to evaluate the effectiveness of different distance learning approaches in promoting occupational health and safety awareness among diverse populations.

CHNs can plan and evaluate the efficacy of worker safety and health initiatives more easily by using behavioral theories, which are valuable resources. It has been recommended to apply behavioral modification theories to injury prevention and primary care settings. These theories have the potential to be useful in developing policies and procedures aimed at preventing OSH-related illnesses and injuries in healthcare settings. One of the most reliable motivating theories that explains people's behavior by taking into account their psychological processes is the Theory of Planned Behavior (TPB). It has gained popularity as a behavioral paradigm for creating and assessing behavior modification programs and their results. It has been shown that the TPB, an expansion of the theory of reasoned action, accounts for a significant amount of the variation in intention to carry out a variety of health-related behaviors. According to the TPB, a person's intention to engage in a behavior is directly influenced by their attitude, subjective norms, and perceived behavioral control. The degree to which someone views a specific behavior favorably or adversely is referred to as their attitude. Subjective norms are related to the urge to imitate other people's behavior and describe whether significant others (such family members and coworkers) accept or disapprove of a behavior. "Perceived ease or difficulty of performing the behavior" is the conceptual definition of perceived behavioral control. According to this model, the most significant predictor of an individual's real behavior (Guerin and Sleet, 2020).

The potential for embracing distance-learning modern approaches in community health nursing to raise within-facility safety awareness and occupational health is significant and multifaceted. Here's how:

Enhancing Education and Training:

- Accessibility and Flexibility: Distance learning platforms like e-learning modules, interactive simulations, and webinars can reach nurses in remote areas or busy schedules, improving access to vital safety and health training.
- Cost-effectiveness: Compared to traditional in-person workshops, distance learning can be cheaper, saving on travel, venue costs, and staff time.
- Standardized Training: Consistent and up-to-date safety protocols can be delivered to all nurses across facilities through centralized online resources.
- Targeted Learning: Specific programs can be tailored to address unique safety risks and occupational hazards within different facilities.

Improving Safety Awareness and Compliance:

- Interactive Learning: Engaging formats like virtual reality simulations and gamified quizzes can increase knowledge retention and encourage safe practices.
- Regular Refresher Courses: Distance learning allows for frequent and easily accessible safety awareness updates, keeping protocols fresh in nurses' minds.
- Performance Tracking: Online platforms can track individual and facility-wide safety compliance, allowing targeted interventions and improvements.
- Communication and Collaboration: Online forums and communities can foster knowledge sharing and peer support among nurses, promoting a culture of safety.

Benefits for Occupational Health:

- Reduced Workplace Injuries: Improved safety awareness and training can lead to fewer accidents and injuries, lowering healthcare costs and promoting staff well-being.
- Enhanced Productivity: A safer work environment can reduce absenteeism due to work-related injuries, boosting productivity and efficiency.
- Improved Morale: Feeling safe and well-trained can lead to higher morale and job satisfaction among nurses, contributing to a positive work environment.

Challenges and Considerations:

- Technology Access and Skills: Some facilities may lack adequate internet access or staff with necessary digital skills, requiring investment in infrastructure and training.
- Engagement and Motivation: Keeping nurses engaged in online learning requires interactive formats, personalized feedback, and incentives.
- Practical Skills Training: Certain safety procedures may require hands-on practice, necessitating a blended approach with in-person components.
- Evaluation and Assessment: Effectively measuring the impact of distance learning on safety outcomes requires robust evaluation methodologies.

Abbreviations

AAOHN: American Association of Occupational Health Nurses
CAPMAS: Central Agency for Public Mobilization and Statistics
CHNs: Community Health Nurses
DL: Distant Learning
ILO: International Labor Office
OHS: Occupational Health and Safety
TPB: Theory of Planned Behavior
WHO: World Health Organization

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