Occupational Hazard among Hospital Workers in Rivers State

Righteous, Innime
School of Public Health
University of Port Harcourt

Chibuzor, Chika
Ignatius Ajuru University of Education
Rumuolumeni, Port Harcourt
Department of Human Kinetics, Health and Safety Studies

Abstract
The investigate on occupational health hazards faced by healthcare workers in Rivers State and the control measure, these was done in consideration of cross-sectional studies that utilized several quantitative data collected from some health facilities in Rivers State. In the light of the above, the following areas were demystified; The concept of occupational health, the main focus of occupational health, different types of occupational hazards prevalent among Rivers State Health Workers, which includes, the biological, chemical, physical, psychosocial/psychological, musculoskeletal disorder/ergonomic. Effects and control measures of the hazards were considered. It was also necessary for roles of the occupational health worker towards mitigating the hazards to be pointed out as well as major recommendations.

INTRODUCTION

Health care workers define to be all people engaged in actions whose primary intent is to enhance health. They make important contributions and are critical to the functioning of most health systems. Health care workers face a wide range of hazards on the job; including needle stick injuries, back injuries, latex allergy, violence, and stress.

Health-care workers (HCW s) need protection from these workplace hazards just as much as do mining or construction workers. Yet, because their job is to care for the sick and injured, HCW s are often viewed as "immune" to injury or illness. Their patients come first. They are often expected to sacrifice their own well-being for the sake of their patients. Indeed health protecting health-care workers has the added benefit to contribute to quality patient care and health system strengthening.

The 2006 World Health Report Working Together for Health on human resources reported on a global shortage of health personnel which had reached crisis level in 57 countries and called for the support and protection of the health workforce. Unsafe working conditions contribute to health worker attrition in many countries due to work-related illness and injury and the resulting fear of health workers of occupational infection, Including HIV and Tuberculosis. The 2006 World Health Report Working Together for Health reported on a severe health workforce crisis in fifty-seven countries, most of them in Africa and Asia.

The WHO Global Plan of Action on workers health calls on all member states to develop national programmes for health worker occupational health and to develop national campaigns for immunizing health workers against hepatitis B. WHO global burden of disease from sharps injuries among health workers, showed that 37% of the hepatitis B among health workers was the result of occupational exposure. Infection with the hepatitis B virus is 95% preventable with immunization but less than 20% of health worker in some regions of the world have received all three doses needed for

immunity. While less than 10% of the HIV among health workers is the result of an exposure at work. Needle stick injuries, the cause of 95% of the HIV occupational seroconversions, are preventable with practical, low-cost measures and have the co-benefit of preventing exposure to other blood borne viruses and bacteria.
A National Institute for Occupational Safety and Health (NIOSH) report indicated that an estimated 600,000 to 800,000 percutaneous injuries occur annually to HCWs, (Department of Health and Human Services, 1999). The Association of Peri Operative Registered Nurses (AORN) says in its position statement on workplace safety, "Nurses practicing in the perioperative environment are at distinct risk for percutaneous injury due to prolonged exposure to open surgical sites, frequent handling of sharp instruments, and the presence of large quantities of blood and other potentially infectious body fluids. (Jagger, Bentley, and Tereskerz, 1998). Particular concerns to an aging nursing population are ergonomic-related injuries. Back injuries pose a significant risk to perioperative nurses and are the most prevalent occupational injury in the healthcare industry 5. Direct costs associated with occupational back injuries of HCWs average $37,000, while indirect costs associated with back injuries can range from $147,000 to $300, 000, (Blackmon, 1999). According to AORN's workplace-safety position statement, "Key indicators to an organization's culture and commitment to ensure a safe workplace include maintaining safe equipment, providing adequate nurse staffing levels, and fostering safe work practices. An unsafe workplace contributes to work-related injuries and diseases that often result in physical, emotional, and financial difficulties for perioperative nurses. Occupational injuries resulting from an unsafe workplace impact the healthcare organization by increased costs and a reduced ability to provide services. Occupational hazards in the workplace have been identified as a major contributor to nurses leaving the profession, contributing to the growing nursing shortage, (Clarke., et al. 2002).

The Concept of Occupational health

Occupational health is a multidisciplinary field concerned with the safety, health, and welfare of people at occupation. These terms also refer to the goals of this field, (Mosby's Medical Dictionary). So their use in the sense of this article was originally an abbreviation of occupational safety and health program/department etc.
The goal of an occupational safety and health program is to foster a safe and healthy occupational environment. Fanning Fred (2003). OSH also protects all the general public who may be affected by the occupational environment, (Guidance note: 2005).
In common-law jurisdictions, employers have a common law duty to take reasonable care of the safety of their employees, (WPRO 2015). Statute law may, in addition, impose other general duties, introduce specific duties, and create government bodies with powers to regulate occupational safety issues: details of this vary from jurisdiction to jurisdiction.

Definition of occupational health

According to Righteous and Chibuzor (2021), Occupational health is the total well being of workers at work zone in the absent of harm and injury infliction on the body.
As defined by the World Health Organization (WHO) "occupational health deals with all aspects of health and safety in the workplace and has a strong focus on primary prevention of hazards. (WHO 2016). Health has been defined as "a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity. (Occupational Health Services And Practice. 2013). Occupational health is a multidisciplinary field of healthcare concerned with enabling an individual to undertake their occupation, in the way that causes least harm to their health. It aligns with the promotion of health and safety at work,

which is concerned with preventing harm from hazards in the workplace. Since 1950, the International Labour Organization (ILO) and the World Health Organization (WHO) have shared a common definition of occupational health. It was adopted by the Joint ILO/WHO Committee on Occupational Health at its first session in 1950 and revised at its twelfth session in 1995.

The main focus of Occupational health

The main focus in occupational health is on three different objectives:

(i.) The maintenance and promotion of workers' health and working capacity;

(ii.) The improvement of working environment and work to become conducive to safety and health.

(iii.) Development of work organizations and working cultures in a direction which supports health and safety at work and in doing so also promotes a positive social climate and smooth operation and may enhance productivity of the undertakings.

The concept of working culture is intended in this context to mean a reflection of the essential value systems adopted by the undertaking concerned. Such a culture is reflected in practice in the managerial systems, personnel policy, principles for participation, training policies and quality management of the undertaking.

Those in the field of occupational health come from a wide range of disciplines and professions including medicine, psychology, epidemiology, physiotherapy and rehabilitation, occupational therapy, occupational medicine, human factors and ergonomics, and many others. Professionals advise on a broad range of occupational health matters. These include how to avoid particular pre-existing conditions causing a problem in the occupation, correct posture for the work, frequency of rest breaks, preventive action that can be undertaken, and so forth.

Occupational health should aim at: the promotion and maintenance of the highest degree of physical, mental and social well-being of workers in all occupations; the prevention amongst workers of departures from health caused by their working conditions; the protection of workers in their employment from risks resulting from factors adverse to health; the placing and maintenance of the worker in an occupational environment adapted to his physiological and psychological capabilities; and, to summarize, the adaptation of work to man and of each man to his job.

Given the high demand in society for health and safety provisions at work based on reliable information, occupational safety and health (OSH) professionals should find their roots in evidence-based practice. A new term is "evidence-informed decision making". A working definition of evidence-based practice could be: evidence-based practice is the use of evidence from literature, and other evidence-based sources, for advice and decisions that favor the health, safety, well-being, and work ability of workers. Therefore, evidence-based information must be integrated with professional expertise and the workers' values. Contextual factors must be considered related to legislation, culture, financial, and technical possibilities. Ethical considerations should be heeded. (Van Dijk, Frank 2012).

The Different Type of Hazards Prevalent Among the Health Care Workers in Rivers State.

a. BOLOGICAL HAZARDS: Biological hazards include occupational exposure to blood borne pathogens and infectious agents or diseases (see Table).Exposure to blood borne pathogens, particularly hepatitis B virus (HBV) and human immunodeficiency virus (HIV), is of greatest concern today.

HBV and HIV: The Occupational Safety and Health Administration (OSHA) estimates that more than 5.6 million health care and related occupations are at risk of exposure to blood

borne pathogens such as HIV and HBV and other potentially infectious materials. Of these health care workers, approximately 3 million work in hospitals, physicians' offices, and government clinics. In 1991, OSHA estimated that 18,000 health care workers with occupational exposure to blood borne pathogens will become infected annually with HBV, and 250 will die of related complications (DiBenedetto, 1992a). Needle stick injuries pose the greatest threat to health care workers for exposure to blood borne pathogens, including HBV and HIY. Exposure to these pathogens occurs when contaminated blood or body fluid from an infected individual comes in direct contact with the healthcare worker through accidental injection (needle stick), an open lesion on the health care worker's skin, or through exposure to mucous membranes (e.g., eyes, mouth). OSHA promulgated a standard on occupational exposure to blood borne pathogens (29 CPR 1910.1030), which took effect in March 1992. The standard protects employees who have occupational exposure to blood borne pathogens, including, but not limited to: physicians, nurses, phlebotomists, dentists, emergency medical personnel, therapist's orderlies, nurses' aides, laundry workers, and other health care workers. OSHA requires employers covered by the standard to establish an exposure control plan that comprises:

- Identifying jobs/titles with occupational exposure to blood or other potentially infectious materials.
- Developing and training workers in exposure control methods/procedures.
- Establishing post-exposure and follow up procedures.
- Providing appropriate personal protective equipment.
- Offering HBV vaccine at no charge to the employee.
- Establishing house keeping and safety procedures.
- Maintaining appropriate records related to the exposure control program, training, and exposures.
- Establishing procedures for evaluating the circumstances of an exposure incident.
- The exposure control plan must be in writing and made available to workers and OSHA representatives, and must be updated annually or whenever changes in procedures create new occupational exposures to blood borne pathogens.

Tuberculosis

A resurgence of tuberculosis (TB) in the mid 1980s was largely attributable to the HIV epidemic, influx of persons from Asia, physicians' non-adherence in prescribing recommended drug regimens, the emergence of antibiotic resistant strains of TB, and a decrease in resources for prevention and elimination of TB (Hellman,1993). Because of recent outbreaks of TB in healthcare settings, including outbreaks of multi-drug resistant strains of Mycobacterium TB, the Centers for Disease Control and Prevention (CDC) has expressed heightened concern about nosocomial transmission (Hellman, 1993).

Reported cases of drug resistant TB generally have been the result of contact with other persons with drug resistant TB or inadequate treatment of initial TB infection. The magnitude of occupational risk of transmission varies considerably by type of health care setting, client population, job category, and the work site area in which an employee works.

Higher risks anticipated for employees in contact with persons with TB who are provided care before diagnosis (for example, in clinics or emergency rooms) or when diagnostic or treatment procedures that stimulate coughing are performed at the health care facility (Hellman, 1993). However, all health care workers in all employment settings share the risk of TB transmission once the hazard of an infectious patients present. The CDC has developed detailed recommendations and precautions for exposure to TB in health care settings which OSHA has adopted in evaluating an employer's TB exposure control plan. CDC final guide

lines issued October 28, 1994 (Guide lines, 1994) list the characteristics of an effective TB infection control program:

- Assignment of responsibility for the TB infection control program to qualified person(s).
- Risk assessment (and periodic reassessment) for TB exposure in the facility.
- A protocol for the early identification and management of persons with active TB.
- Written TB Infection Control Plan.
- Engineering controls.
- Written procedures to reduce TB exposure of personnel during cough inducing or aerosol generating procedures.
- Respiratory isolation rooms for suspected or confirmed infectious TB patients. These rooms must be maintained under negative pressure within side air exhausted to the outside.
- Training and information on signs and symptoms of TB, medical surveillance, therapy, and site specific protocols, including the use of controls (administrative, engineering, and use of personal protective equipment, i.e., respirators).
- Provision of respiratory protection (i.e., respirators) where administrative and engineering controls may not provide adequate protection: in TB isolation rooms or in rooms/enclosures for cough inducing or aerosol generating procedures (such as bronchoscopy, suctioning); when transporting patients with infectious TB; and during urgent surgical/dental treatment prior to rendering the patient" non-infectious." It should be noted that the use of high efficiency particulate air (HEPA) respirators is emphasized as a last resort in controlling exposure to TB. When these respirators are used by employees, employers must provide appropriate health assessment, training, fit testing, and maintenance according to OSHA's Respiratory Protection Standard (29CFR1910.134).
- Free medical screening including pre-placement evaluation, administration, and interpretation of Mantoux skin tests every 3 months for employees with high risk of TB and annually for other employees.
- Evaluation and management of workers with a positive skin test or a history of positive skin tests who are exhibiting symptoms of TB, and appropriate work restrictions for affected employees

Infectious Agents and Their Sources	
Infectious Agents	**Source of Transmission**
HepatitisA	Feces
HepatitisB	Blood and body fluids
Hepatitis C (non-A, non-B hepatitis)	Blood and body fluids
Hepatitis D (found only in patients with HBV)	Blood and blood products
Hepatitis E	Feces
Rubella (German measles)	Respiratory secretions; virus shed in urine and stool
Rubeola (measles)	Respiratory secretions
Mumps	Respiratory secretions, saliva
Influenza	Respiratory secretions
Scabies	Contact with infected skin lesions
Varicella zoster virus (VZV) Chickenpox and Shingles	Airborne droplet nuclei(chickenpox only)
Herpes simplex virus (HSV), Type I, Type II, Herpetic whitlow	Secretions of lesions, saliva (both chicken pox and shingles) Secretions of lesions, saliva
Acquired immunodeficiency syndrome (AIDS)	Blood and body fluids
Pulmonary tuberculosis	Airborne droplet nuclei
Sa/manella, Shigella,	Feces
Campy/obaeter	Blood and body fluids
Cytomegalovirus(CMV)	Respiratory secretion
Respiratory syncytial virus (RSV)	

b. CHEMICAL HAZARDS

Health care workers are occupationally exposed to a multitude of chemical hazards including disinfectants (e.g., isopropyl alcohol, iodine, betadine, chlorine), sterilizing agents (formaldehyde, glutaraldehyde, ethylene oxide [ETO]), solvents (alcohol, acetone, benzoin), anesthetic agents (e.g., gases such as nitrous oxide, enflurane, halothane, isoflurane), chemotherapeutic agents (e.g., antineoplastic and cytotoxic drugs, pentamidine [an anti-protezoan agent], and ribavirin [an antiviral drug]). Latex (as in latex gloves) (Shama, 1993), detergents, tissue fixatives, and reagents are among other chemical hazards to which health care workers are exposed (Behling, 1993; New YorkState Nurses Association 1992).

Just as employees are in other employment settings covered by the OSHA Hazard Communication Standard (HazCom), so are health care workers. OSHA requires that employees in all employment settings be informed, by their employer, of the hazards associated with the chemicals used in the workplace. By law, manufacturers and distributors must provide information in the form of a material safety data sheet (MSDS) for each chemical substance or mixture of chemicals.

The MSDS provides information about the chemical trade and generic names, in gradients, safe handling and exposure information, emergency contact information, reactivity data, health effects, storage, spill handling, and personal protective equipment requirements. While the MSDS may vary from manufacturer to manufacturer, categories of information are mandated by OSHA. MSDS must be readily available and accessible to the workers who use the chemical(s) (DiBenedetto, 1992a). Chemicals enter the body through various routes and are ranked according to order of occurrence inhalation (of gases, vapors, fumes, dust, mists), percutaneous skin absorption, ingestion, and accidental needle stick.

c. PHYSICAL HAZARDS

Occupational physical hazards for health care workers include exposure to needles and other sharp instruments, ionizing and non-ionizing radiation, electrical hazards, compressed gases, noise, extremes of temperature, and various forms of aggression and violence. Physical hazards also include ergonomic hazards associated with repetitive strain or motion and musculoskeletal injuries.

Back Injuries: Musculoskeletal injuries are the most common physical hazard to health care workers. According to a study of more than 600,000 workers' compensation claims, more than one third of all claims are due to back injuries. Over 50% of these back injuries occurred within the health care field, a direct result of lifting; nurses and nurse's aides incur the highest number of musculoskeletal or back injuries (National Safety Council, 1993). Approximately 25% of all workers' compensation claims indemnity expenditures in eight states were for back injuries (Fieldstein, 1993).

Back injuries are caused, in part, by job design, improper body mechanics, equipment and patient handling, and transfers. Tasks such as transferring dependent patients often exceed the maximal permissible lift as defined by the National Institute of Safety and Health (NIOSH) (Fieldstein, 1993). Each year 40,000 nurses report illness due to back pain, and over 764,000 lost work days are incurred. At least one in 15 nurses will experience back injury serious enough to interfere with their professional career (Garrett, 1992).

A University of California at Los Angeles study of 179 nurses found that training the workers in proper lift techniques did little to keep them from being injured. The 18 month study also revealed that factors such as physical load and past back injury put the workers at considerable risk for on the job back injury. The researchers concluded that formal training in proper lift technique did not appear to be of significant protective value, and suggested that when training is overemphasized, it can cause the nurses to fail to recognize other physical factors that can increase potential risk of back injury (News roundup, 1994).

Radiation: Ionizing radiation is used for a variety of diagnostic and treatment procedures including radiographs, fluoroscopy, angiography, computerized axial tomography (CAT) and nuclear medicine scans, teletherapy, and cobalt treatments. Ionizing radiation has cumulative and long term effects, and, while all of the above procedures have significant medical benefits, all radiation is harmful to living tissue. Occupational exposure limits are established by the Nuclear Regulatory Commission and enforced (through a memorandum of understanding) by OSHA.

Non-Ionizing Radiation: Non-ionizing radiation includes lasers, ultraviolet lighting, microwaves, and magnetic fields. Lasers, used primarily in the operating room, pose a danger to the skin and eyes because of light and heat. Health care facilities should establish laser safety programs specific to the use of lasers in their facility and educate exposed health care workers about the establishment's laser precautions, which should address the following:

- Assigning a knowledgeable person as a Laser Safety Officer (LSO) with the authority and responsibility for laser program oversight who will monitor and enforce the control of laser hazards.
- Establishing laser policies and use procedures.
- Training employees in the proper use of lasers. Employees requiring laser training include, but are not limited to the LSO, laser physicians, nurses, medical support staff; laser technical support staff; and laser system service support personnel.
- Ensuring that laser impact points are free of flammable and combustible substances.
- Ensuring that warning signs are posted at entrances to laser use areas.
- Establishing use precautions, including: provision and use of appropriate goggles/glasses for affected patients and health care workers; skin and tissue protection while laser is in use; and surgical high filtration masks (respirators) if procedure produces a "plume"; baseline and periodic medical surveillance (i.e., eye and skin examinations) for exposed personnel.

Violence: Health care workers are at risk from both verbal and physical aggression. Incidents of both are considered to be under reported due to peer pressure, the desire to avoid lengthy paperwork, fear of reprisal, and concern about accusations of patient abuse (New York State Nurses Association, 1992). Violence toward health care workers is an emerging issue (Lipscomb, 1992). A special report on occupational violence appeared in the December 1993 issue of the OEM Report, and an entire issue of the MORN Journal was devoted to the subject in May 1992. The professional literature acknowledges that the health care industry is at greater risk for violent incidents than other businesses (Felton, 1993).

d. PSYCHOSOCIAUPSYCHOLOGICAL HAZARDS

Psychosocial or psychological hazards in the health care setting include exposure to stress or stressors in the workplace, burnout, substance abuse, mental illness, the effects of shiftwork, and sexual harassment. Emotional stress is considered one of the most significant health hazards for health care workers. Constant demands on their time, energy, and professional skills, along with the stress of direct responsibility for patient care, exposure to death and dying, and anxious and suicidal patients (all of which may be exacerbated by hectic work patterns that do not allow for restful breaks), put them at high risk. Health care workers, especially physicians, have a high incidence of depression (Behling, 1993).

Shiftwork: Research has documented the negative health effects of shiftwork and the negative impact on the shift worker's social life (strained relationships, fewer friends). Health care workers who work on a rotating or night shift schedule report a higher incidence of sleep disturbances, chronic fatigue, stress, and eating and elimination disorders. Studies also indicate that female rotating shift workers have a higher incidence of miscarriages and low birth weight babies (Behling, 1993).

e. REPRODUCTIVE HAZARDS

Occupational hazards studied in relation to adverse reproductive outcomes include radiation, chemotherapeutic agents, solvents, video display terminals (VDTs) (McAbee, 1993), and shiftwork (Behling, 1993). Exposure to occupational hazards has been associated with altered fertility, gene size defects, chromosomal abnormalities, spontaneous abortions, late fetal deaths, congenital malformations, altered gestational length, intrauterine growth retardation,

neonatal deaths, infant deaths, developmental disorders, chronic disease, and malignancies (New York State Nurses Association, 1992). When workers or their spouses are considering pregnancy, special attention should be paid to the workplace hazards that may impact on fertility, the developing fetus, and/or the mother's health. McAbee (1993) noted synergy between the adverse reproductive effects among nurses from multiple workplace factors, including radiation, VDTs, and chemotherapeutic agents; this finding warrants further investigation. Part of prenatal care should include clinical evaluation of the woman's medical and obstetrical status, work requirements and activities, physical demands of the job, and potential for exposure to reproductive hazards (McAbee, 1993).

f. MUSCULOSKELETAL DISORDERS/ERGONOMIC HAZARD: Over 5000 manual handling injuries are reported each year which occur in health services. Approximately half of these happen during the handling of patients. The handling of patients is a major cause of these injuries, but it is not the only one. Ancillary staff can also suffer from injuries related to manual handling of loads. Stresses and strains arising from awkward or static postures when treating patients can also give rise to problems (WPRO 2015). Some staff may have to adopt and hold awkward postures as part of their work, such as ultrasound operators and operating theatre staff.
Extensive evidence suggests that the numbers of workplace injuries and illnesses reported annually by the U.S. Department of Labor, Bureau of Labor Statistics, are underestimated for all private employers. Several states have passed safe patient handling legislation to reduce work-related musculoskeletal disorders (WMSDs) among health care workers. Research is needed to improve accurate reporting of these types of injuries to allow assessment of the effectiveness of this legislation and to enable hospitals and nursing homes to better target interventions to areas at high risk for WMSDs, (WHO 2016). Health care workers show a higher prevalence of low back pain (LBP), (Andersen, Clausen, Mortensen, et at 2011). than many other occupational groups, (Ijzelenberg, Burdorf, 2005), (Johansson 1995) and (Karahan, Kav , et al, 2009). The annual prevalence of LBP among health care workers is as high as 77%, (Karahan, Kav , et al, 2009). Health care workers are generally characterized by having a high physical work load and high prevalence of overweight, (Faber, Giver, Stroyer, Hannerz, 2010) and (Luime, Kuiper, Koes, 2004). A risk may arise from anything — whether work materials, equipment, work methods or practices — that have the potential to harm. Workers can be at risk of MSDs in virtually every workplace. The risks in the healthcare sector are related to the following aspects of work

Technical factors include:

- Poor ergonomic design of the building;
- Adverse working environment (e.g. hot, cold, draughts from air conditioning);
- Insufficient space for working activities which may lead to awkward postures and unsafe displacement of goods;
- Unsuitable ergonomic design of the workplace, such as workplace arrangement, height and arm-reach;

Organizational factors may include:

- Tasks that are too strenuous; the tasks are, for example, carried out too frequently or for too long a time or workers work too long without breaks;
- Lack of training and follow-up training;
- Non-provision of suitable personal protective equipment, such as footwear and working gloves.

Factors due to the work task include:

- Manual handling of loads carried out by one or more workers such as lifting, holding, lowering, pushing, pulling, carrying or moving loads.
- Manual handling of patients which covers all activities where the weight or part of the patient's weight is raised, pushed, pulled, transferred or carried.
- Awkward postures or movements such as bending and/or twisting, raised arms, bent wrists, over reaching and over exertion;
- Repetitive activities/handling (not likely to be found in healthcare);
- Prolonged standing such as in the operating theatre at the operating table, often combined with a bent over or awkward position;

Other infectious disease (Hazard) exposures:

Many investigations have addressed the risks of occupationally acquired infections among health care workers from exposures to numerous sources, including patients, visitors, other health care workers, and the environment. Also, numerous opportunities exist for health care workers to increase the risk of infection in patients. For example, a health care worker with a transmissible infection may transmit it to a patient during a patient care interaction. Reducing these risks requires identification and management of infected workers as well as appropriate vaccination of workers, (CDCP 1997) (Weber, Rutala, Hamilton, 1996) (Poland, Schaffner, Pugliese 2000). Positive patient outcomes related to worker health have been reported. For example, influenza vaccination of health care workers has reduced influenza-related mortality in the elderly in long-term care facilities and hospitals, (Poland, Schaffner, Pugliese 2000) (Potter, Stott, Roberts, et al1997).

Common hazards and risks in healthcare and hospitals

- lifting, supporting and moving patients
- moving and handling equipment such as wheelchairs and trolleys
- work-related stress
- occupational violence
- slips, trips and falls
- bullying and harassment

Effect of Occupational Hazard on health workers

Effect from non-accidental exposure

Non-accidental exposure to HCW mainly occurs in developing and transitional countries, by intentional re-use of disposable medical equipment, in particular plastic "single use" syringes. An important body of evidence suggests that in such countries where hepatitis B and hepatitis C lead to a high burden of chronic liver disease, re-use of injection equipment without sterilization causes a high proportion of new cases of infection, (DIRECTIVE 93/88/EEC, 1993). Each year, re-use of injection equipment in the absence of sterilization causes an estimated 8 to 16 million HBV infections, 2.3 to 4.7 million HCV infections, and 80,000 to 160,000 HIV infections, (Kane, et al. 1999), costing 1.3 million future early deaths, 26 million of years of life lost, and US$ 535 million direct medical costs.8 Among reported breaks in infection control practices, the failure to dispose of disposable syringes in order to reuse them in the absence of sterilization is one of the most common.

Little evidence is available on the health impacts of other re-used medical devices, but there is documentation on the re-use of bandages and other medical items. Re-use of disposable injection equipment in the absence of sterilization is caused by, (Simonsen et al. 1999), an

absence of awareness among patients and healthcare workers that re-use of dirty injection equipment can transmit infections, (Kane, et al. 1999), shortages of injection equipment, and (Miller et al, 1999), a failure to adequately dispose of injection equipment at the point of use. Of the observed re-use of injection equipment, the available evidence does not allow calculating the proportion of re-use that is attributable to lack of awareness, shortages of supplies, or poor waste disposal. However, the only way to ensure that disposable syringes and needles are not re-used and do not lead to accidental needle stick injuries is efficient, safe, and environment-friendly sharps waste management.

Effects of Biological Agents on Health (Infectious Hazards)

Many micro-organisms have the ability to colonise human hosts, particularly parts of the body that are moist and where there are plenty of nutrients present, eg the eye and the mucous membranes of the respiratory, digestive and urogenital tracts. Most of these organisms, known as "commensals", are harmless and may even be beneficial.

A relatively small number of organisms have developed specific mechanisms to enable them to colonise hosts, evade or counter host defence mechanisms and cause disease. These are called "pathogens" and include the causative agents of anthrax, tuberculosis, cholera, malaria and influenza.

Some organisms, while not able to cause disease in normal, healthy hosts, may be able to harm people with reduced resistance to infection, eg individuals with a defective immune system. These organisms are known as "opportunist pathogens".

Health effects of chemical hazard

Accidents or incorrect use of household chemical products may cause immediate health effects, such as skin or eye irritation or burns, or poisoning.

There can also be longer-term health effects from chemicals. When these occur, they are usually the result of exposure to certain chemicals over a long period of time.

Depending on the chemical, these longer-term health effects might include:

- organ damage
- weakening of the immune system
- development of allergies or asthma
- reproductive problems and birth defects
- effects on the mental, intellectual or physical development of children
- cancer

Control Measures for Occupational Hazards

How to control Biological hazards

Starting from the assumption that all biological substances are potentially harmful and that contamination is almost always the result of a human error, Safety at Work legislation has introduced the obligation of special preventive measures to protect against biological hazards and infectious diseases at the workplace.

High biological hazard jobs and consequences of direct or involuntary contact with free bacteria Some industrial sectors have deliberately introduced the analysis of biological agents at the workplace in order to voluntarily exploit their properties. Therefore, biological risk is a constant of the production process in analysis and health care laboratories – this, notwithstanding mandatory hygiene and disinfection policies. We speak of indirect biological hazard when the pathogen is not directly introduced into the active cycle, but contact is inevitable even if undesirable, e.g. in hospitals, in local health care centres as well as in veterinary surgeries, on agricultural and livestock farms and in the food industries, in fact, the risk of involuntary exposure to microorganisms is high even if the organic substances that

contain them are not manipulated directly. These microorganisms are usually airborne or in the form of droplets (which are disseminated and spread through coughing and sneezing), by direct contact, by exposure to biological fluids and the resulting infectious diseases can be grouped together as follows:

- Hepatitis B and hepatitis C caused by two different viruses;
- Tuberculosis: a bacterial infection that generally affects the lungs, but also other organs (e.g. kidneys, skin);
- HIV virus, the cause of acquired immunodeficiency syndrome (AIDS);
- Other infections such as meningitis, cytomegalovirus, chickenpox, some intestinal infections, influenza viruses and pest infestations (lice, scabies);
- Connatural infections (Rubella, Toxoplasmosis, cytomegalovirus).

Current Occupational Health and Safety Laws have introduced the obligation of special preventive measures, named second-level containment (Art. 275, para. 3, Legislative Decree 81/08), for protection against biological hazards and infectious diseases of people who are exposed to these substances at the workplace. As a first preventive measure, legislation introduced standardized procedures, staff training specifications and prescribed the diffusion of information on possible hazards, workers' behaviour, prevention, hygiene and procedures in case of injury or accidents. Secondly, the supply of suitable protective equipment and the prophylaxis to be followed by workers. In addition, the optimization and the ordinary and extraordinary maintenance of the equipment used for the processing, analysis and storage of potentially harmful substances. The host environment must be kept clean and free from any instrument or tool that is not closely related to the activity at hand, sealed containers for the collection of infected waste must always be close by. Equipment used in hazardous areas must not be taken into risk free areas. In particular, only authorised personnel wearing the prescribed protective clothing may be allowed access into places exposed to pathogens. All work garments and equipment i.e. protective suits or gowns, gloves, headgear, shoe covers, masks, eyewear and respiratory protective devices should be removed at the end of each shift to avoid contamination of the skin.

KASCO srl supplies various types of respiratory protective devices for protection against biological hazards, such as the K80E T8X powered respirators which provide complete protection of the head, face, neck and ears. Both models are equipped with an audible alarm which signals imminent battery discharge and / or filter clogging.

How to control chemical hazards?

You can take steps to protect yourself and your family from chemical risks:

Read and follow all directions when using household chemical products. If you don't understand something on the label, contact the manufacturer.

Open windows to provide ventilation during and after use of certain household chemical products, since some of these can release chemicals into your indoor air. However, during periods of high levels of outdoor air pollution, you should take measures to reduce the air entering your home from outside, such as closing your windows and turning on your air conditioning.

Keep all household chemical products out of sight and out of reach of children and animals. Make sure closures on child-resistant containers are working.

Consult the Air Quality Health Index, and consider adjusting outdoor activities when air quality is poor, especially if you have heart or breathing problems.

How to Control Ergonomic Hazard

When ergonomic hazards are identified, it may be necessary to redesign aspects of a workspace or employee routine. Anything that could cause employees to experience long- or

short-term strain should be evaluated and alterations to procedures and work spaces should be considered. If it's determined that ergonomic hazards cannot be removed from a workplace, controls can be implemented to reduce risks that are involved.

Engineering controls

Engineering controls limit risk by reducing or eliminating safety hazards through physical means. Examples of engineering controls for ergonomic hazards include:

- Breaking down tasks and weight loads to reduce the exertion necessary by employees
- Limiting employee exertion by using equipment for heavy lifting
- Redesigning work spaces to accommodate individuals in order to reduce strain and improve posture
- Ensuring that all work spaces provide employees the full range of motion required to complete a task
- Repositioning objects and surfaces such as tables in the workplace to reduce the need for reaching

Administrative Control

- It reduces the risk by changing work processes and activities in order to make them more safe. Some examples of administrative controls for ergonomic hazards are:
- Provide employees with break periods that help to reduce short-term strain.
- Adjusting the pace of work to reduce exertion.
- Rotate employees working in repetitive or strenuous tasks, to reducing exposure.
- Store objects and tools where employees can retrieve them while maintaining neutral position.
- Label any heavy loads with their weight amount.
- Place requirements on weight loads by introducing group lifting policies.

ROLE OF THE OCCUPATIONAL HEALTH WORKER

The occupational health Worker has a primary role in helping the health care work force attain and maintain a maximum level of health by performing a variety of health and management functions. The specific functions are based on the hospital or health care facility environment, employer's need and expectations, corporate philosophy, and the occupational health nurse's professional expertise in occupational safety and health. As in other industries, the occupational health nurse should be a member of management to establish and direct a quality occupational safety and health program for the employer.

The occupational health Worker can provide a wide variety of quality services, which can increase in scope and complexity with appropriate education, certification, and work experience. Examples of the occupational health nurse's responsibilities can include (DiBenedetto, 1992a,b):

- Working collaboratively with other disciplines (e.g., risk management, infection control, radiology, occupational medicine) to establish and implement occupational health and safety policies and procedures.
- Developing and maintaining the hospital's hazard abatement program and occupational safety and health program/services.
- Participating on various workplace committees to provide occupational health expertise and ensure that operating procedures afford the greatest employee and patient protection during implementation (e.g., the use of lead aprons by patients during radiography, hand washing by staff between patient contacts).

- Directing and administering OSHA compliance programs, including, but not limited to: exposure to blood borne pathogens, TB, and documentation of occupational injuries and illnesses.
- Identifying health problems and appropriate nursing intervention; applying case management and health care cost containment measures to preserve the health and well being of the work force.
- Preventing injury and illness through health promotion and health education programs geared to the hospital or health care worker.
- Identifying real and potential hazards in the health care worker's environment by directing or conducting facility assessments and referring abatement to the appropriate discipline or members of management.
- Acting as a liaison between the worker, hospital health care employer, outside community, and professional resources to facilitate the lines of communication and professional cooperation.
- Providing crisis intervention and appropriate referral to the employee assistance program or outside agency

Conclusion:

The increasing prevalence of occupational hazards and work-related diseases among healthcare professionals in Rivers State is a concern. 66 Risk factors include exposure to hazards and a failure to follow hierarchical control strategies. Health care workers and administrators must work together to eliminate or minimize these hazards through the introduction of and strict adherence to engineering, administrative, and personal protective equipment (PPE) controls. The perceptions of workers can greatly affect their implementation of risk-mitigation strategies.

Recommendations

Much of the work on stress, as mentioned above, has been marked by few subjects and short follow-up. Furthermore, definitions vary. For example, "shift work" may include split shifts, rotating shifts, and flex time. Studies are usually uni-dimensional and may evaluate only health effects or workers' compensation, company medical files, absenteeism, turnover, or mortality. They virtually never investigate family, social, economic, or pre-existing personality or chemical dependency problems. The studies are almost never prospective or longitudinal, and assay methods are often idiosyncratic and poorly validated. More interdisciplinary work is needed and a much better understanding of work-related and non-work-related stress, since lives and work and health all interact. Finally, we should learn about the impact of a "stressed" health professional on the healing of a "stressed" patient. All of this information could be helpful in developing approaches to reducing and coping with stress for health professionals.

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