

## **The occupational hazards of healthcare personnel in hospitals: A study based on review of literature**

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### **Abstract**

*Hospitals have many unique hazards that can potentially affect the health of employees. These hazards include biological hazards, chemical hazards, ergonomic hazards, hazardous drugs, ionizing and non-ionizing radiation, shift work, stress, and violence. These hazards, if not taken seriously, by the hospitals and the healthcare organizations can have adverse effects on the health of the healthcare personnel. Severe health hazards and injuries can lead to workers missing work or being assigned to restricted or modified duty. This might bring down the productivity of the hospitals and would also leave the healthcare workers in a poor state of health. This paper attempts to identify the different occupational hazards faced by the healthcare personnel in the hospitals and puts an effort to suggest some probable measures to reduce the effect of these hazards.*

**Keywords:** Occupational hazards, health hazards, healthcare personnel, hospitals, health services

### **Introduction**

Hospitals require a diverse healthcare workforce like doctors, nurses, technicians, laboratory workers, social worker's maintenance, security administration, food services, housekeeping, mortuary and so on. Health care personnel (HCP) are those working in a healthcare setting who have the potential for exposure to patients and/or to infectious materials, including body substances, contaminated medical supplies and equipment, contaminated environmental surfaces or contaminated air. Health services are also provided in a variety of settings, small or large, including outpatient, inpatient, labor rooms, operation theatres, emergency care, clinics and nursing homes. Hazardous elements include blood borne pathogens (biological), chemicals, drugs, anesthetic gases, laser, workplace violence, radiation exposures, biomedical waste, ergonomic hazards and repetitive tasks. Some of the potentially hazardous chemicals include formaldehyde (used for preservation of tissue, organs) and numerous other chemicals used in laboratories.

As per a survey in the year 2011, U.S. hospitals recorded 253,700 work-related injuries and illnesses. This computes to a rate of 6.8 work-related injuries and illnesses per 100 full-time healthcare personnel.

In a document "Facts about Hospital worker safety" published by Occupational Safety and Health Administration (OSHA) under the United States Department of Labor in September 2013, it was stated that the rates of recordable injuries and illnesses as surveyed by OSHA are broadly

decreasing across all industries in the United States, including the hospital sector. However, the rate of injury and illness in hospitals remains nearly double the rate for private industry as a whole. The study also states that the rate of occupational hazards in hospitals remains more than those in construction and manufacturing which are generally thought to be relatively hazardous. In the last 20 years, there have been considerable improvements in workplace safety in both construction and manufacturing have surpassed those in hospitals.

Occupational hazards or the rate of injuries which might lead to the healthcare workers missing their duty or restriction or modification of assigned duty is referred to as the Days Away, Restricted, or Transferred (DART) rate. In the most recent year (2011) for which data are available, 58,860 cases of injury or illness were found to be experienced by the private hospitals, which were a result of days away from work.

It has been observed in various research studies that thousands of hospital employees continue to work through modified duty assignments even if they are injured or ill. Hospitals are reported to have a higher rate of “days away” cases than those in other private industries or manufacturing and construction industry.

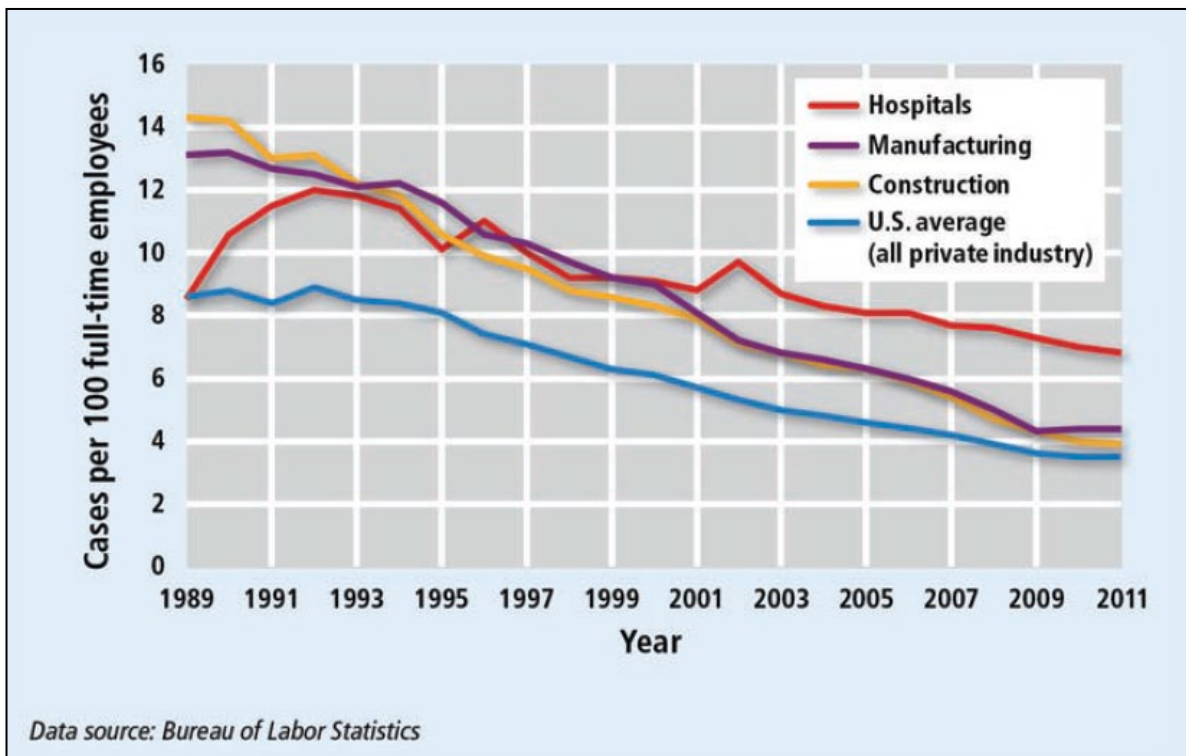


Fig 1: Injury and Illness rates by Industry, 1989-2011

The above graph shows injury and illness rates per 100 full-time equivalent employees (FTEs) which is also known as the Total Case Incidence Rate (TCIR). The TCIR in the above graph includes hospitals, manufacturing, construction and other selected industries from the year 1989 to 2011. This figure includes data for all recordable illness and injuries as recorded by OSHA, regardless of whether they resulted in days away from work or from modified duty assignments.

Healthcare personnel (HCPs) need protection from these workplace hazards just as much as do mining or construction workers. HCPs are often viewed as “immune” to injury or illness just

because their job is to care for the ill and the injured. For them, their patients come first. They are often expected to sacrifice their own well-being for the sake of their patients. Healthy healthcare workers are a must to provide quality patient care and health system strengthening.

The 2006 World Health Report Working Together for Health on human resources reported that there is a global shortage of health personnel which had reached a crisis level in 57 countries. The World Health Organization (WHO) has called on all its member nations for the support and protection of the health workforce. Health worker attrition in many countries is due to unsafe working conditions, work-related illness and injury and the resulting fear of getting infected by occupational infection, including HIV and Tuberculosis. Less than 10% of the HIV among health workers are the result of an exposure at work like needlestick injuries. However, the cause of 95% of the HIV occupational seroconversions, are preventable with practical, low-cost measures. They also have the co-benefit of preventing exposure to other blood-borne viruses and bacteria.

## Objectives

1. To review some existing literature related to occupational hazards in hospitals.
2. To identify the different occupational hazards, that affects the health conditions of the healthcare personnel, from the existing literature.
3. To suggest probable solutions that can help in reducing the effect of the occupational hazards.

## Research Design

The study mainly involves a Descriptive Research as it gives a description of the different occupational hazards prevalent among the healthcare personnel in the hospitals and an effort has been made to suggest some probable measures to reduce the effect of these occupational hazards on the health conditions of the personnel. In this study, the researcher has no control over the variables and can only report the affairs that has happened.

This study is based on Secondary Data and literatures have been reviewed from various publications, websites, books etc. From this secondary data, the different occupational hazards faced by the healthcare personnel have been identified.

## Literature Review

Gestal (1987) in the research paper "*Occupational hazards in hospitals: accidents, radiations, exposure to noxious chemicals, drug addiction and psychic problems and assault*" has highlighted that accidents, photonic radiations and charged particle radiations to which the health workers get exposed to while conducting radiological tests, electrical accidents and exposure to noxious chemicals, drug addictions and psychic problems are some of the major occupational hazards in hospitals. The author has also revealed that one of the most common causes of casualties during hospital fires is asphyxia by smoke which accounts for 78% of deaths and 43% of non-fatal casualties. The author has emphasized on conducting mock fire drill program for the employees to avoid such casualties during fire accidents.

Robert D. Oexman *et al.* (2002) in their paper “*Working While the World Sleeps: A Consideration of Sleep and Shift Work Design*” have emphasized on the evolution of society and economic pressure that has provided the impetus for operating on a 24-hour basis in many industries. This has occurred with relatively little attention toward sleep deprivation and related problems facing shift workers and the organizations employing them. This paper discusses the move towards shift work and some sleep problems associated with it. The authors have also suggested some alternative schedules for shift work implementation like Fixed or Rotating Schedule, Straight shifts & Oscillating shift. In the paper the authors also highlight the fact that a lack of attention to the sleep needs of employees leads to higher absenteeism, a decrease in health (with an increase in healthcare costs), lower employee morale, an increase in accidents, and a decrease in productivity. The consequences associated with sleep problems may be even greater than those associated with drug and alcohol abuse on the job.

Orji *et al.* (2002) investigated occupational health hazards among healthcare workers in an obstetrics and gynecology unit. The common occupational health hazards were work-related stress (83.3%), needle-stick injuries (75.6%), bloodstains on skin (73.1%), sleep disturbance (42.3%), skin reactions (37.2%) assault from patients (24.3%), and hepatitis (8.9%).

Gorman *et al.* (2013) in their comprehensive study “*Controlling Health Hazards to hospital workers*” have identified the different biological and chemical hazards, hazards due to shift work, stress and violence and hazardous drugs among the healthcare personnel”. In their study, they have identified the different engineering and administrative control methods used to reduce these hazards. They have published their study in the form of a reference guide and have presented the information in a way so that it is easily accessible to the hospital employees and healthcare safety professionals.

Ndejjo R. *et al.* (2015) conducted a study on the employees of 8 major health facilities in Kampala, Uganda. In their research article, “*Occupational health hazards among healthcare workers in Kampala, Uganda*”, they have highlighted that out of the 200 respondents, 50% reported about experiencing occupational health hazard, out of which 39.5% experienced biological hazards and 31.5% experienced non biological hazards. The basic associated factors were not wearing necessary Personal Protective Equipment (PPE), working overtime, job related pressure and working in multiple facilities. Some of the control measures to mitigate hazard were availing separate areas and containers to share medical waste and provision of safety tools and equipment.

Shakuntala (2016) in her research study “*Health hazards among healthcare personnel*” mentioned that the major health hazards in healthcare workers are caused due to biological factors (viruses, bacteria and parasites); chemical factors (disinfectants, drugs and diagnostics), needle prick injuries, radiation exposure, violence and psychiatric disorders. The healthcare workers are also at a high risk for musculoskeletal disorders due to patient handling compounded by the increasing number of obese patients. The author has pointed out that many healthcare personnel lack awareness about prevention of health hazards and above that there is a lack of conducive environment and the policies of prevention are also not clear.

Nwankwo *et al.* (2018) in their research article “*The occurrence of occupational hazards in district health facilities in Kigali, Rwanda*” have revealed that regular information regarding the occupational health hazards is critical and crucial for setting priorities necessary to enhance workers health and safety. In their study they have found that backache and accidents experienced by the health workers contribute to most of the occupational hazards. Lack of proper policies regarding the process of collection, sorting, marking, storage and transportation of biomedical

waste also adds to hazard cases.

## Occupational Hazards of Healthcare Personnel Identified from Literature Review

Based on the different literatures reviewed, the following occupational hazards are identified to be the most common and the major contributors which affect the health conditions of the health care personnel:

### 1. Physical injuries and accidents

As per a survey of Occupational Safety and Health Administration (OSHA), recordable work-related injuries have greatly increased in the hospitals throughout the past 20 years. In 2011, injuries accounted for 93% of the total cases recorded; whereas hazards due to illnesses accounted for the remaining 7%. Occupational illnesses of the health workers are under-reported relative to injuries as they are often not identified as work-related.

#### a. Nature of injury

Sprains and strains are identified to be the most common injuries resulting in days away from work are, and this accounts for 54% of the reported injuries. Apart from this, the top six injury categories are bruises, soreness, fractures, multiple trauma, cuts and punctures. The “days away” data tend to under count needle-prick injuries, exposure to TB or other communicable diseases, and other events that might have adverse health effects even when they do not cause the injured worker to miss work immediately.

Figure 2 below shows the distribution of the types of injuries and illnesses resulting in days away from work, in hospitals in the United States in the year 2011. These categories are coded as “nature of injury” in Bureau of Labor Statistics data sets.

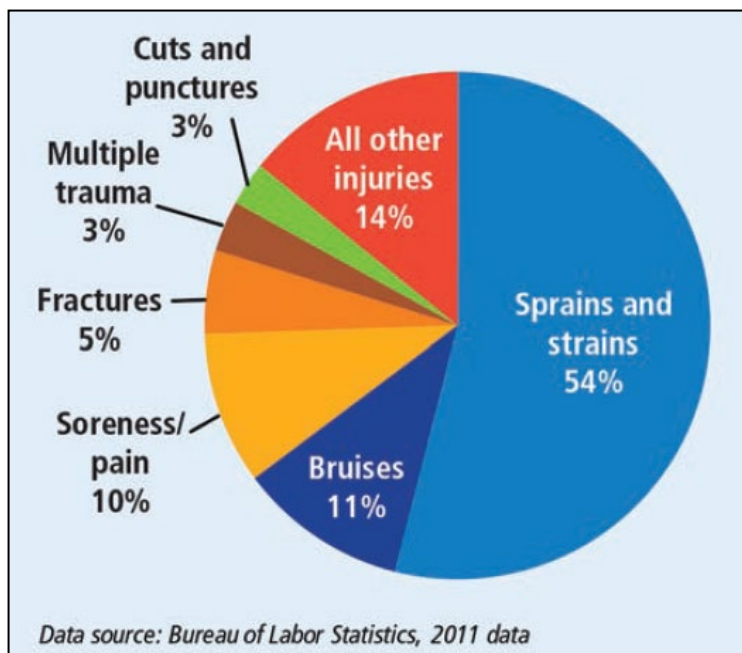


Fig 2

## b. Source of Injury

Roughly one-third of the injuries, of the hospital workforce, resulting in days away from work (32.7% in the year 2011) occur as a result of interaction with the patients. This category encompasses patient handling activities (e.g., Lifting, repositioning, transfer of the patients from one ward to another) as well as violence committed by patients. As per data records of the year 2011, 72% of these patients related injuries resulted in an injury classified as Musculoskeletal Disorder (MSD). Of all occupations, nursing staffs and clinical attendants had the highest rates of MSD as reported in the year 2010. The incidence rate of work-related MSD for these occupations was 249 per 10,000 workers. The other common source of injury includes contact with furniture and rough surfaces.

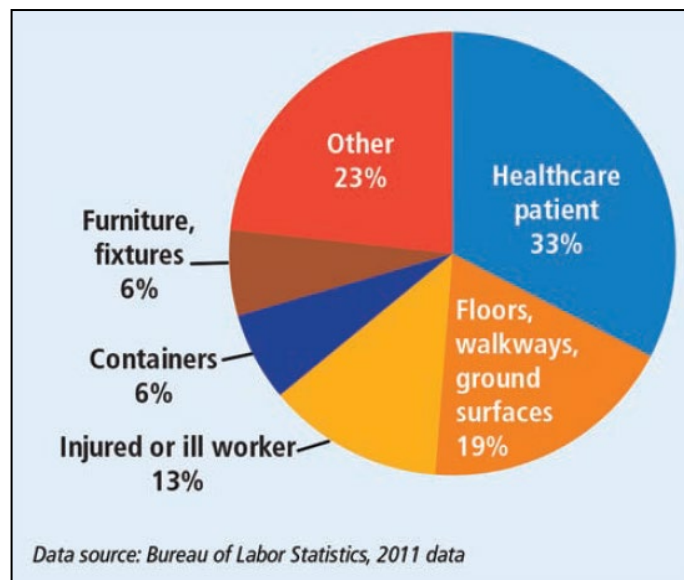


Fig 3

Figure 3 above highlights the causes of injuries and illnesses resulting in days away from work, in hospitals in the United States, in 2011. These categories are coded as “source of injury” in Bureau of Labor Statistics data sets. The source of injury or illness identifies the substance, objects, radiation exposure or bodily motions that directly inflict the injury or illness.

## 2. Exposure to Radiations

The health workers might suffer serious occupational hazards due to the medical use of ionizing radiation. The radiation to which hospital staff may be exposed includes both photonic radiation (x rays and gamma rays) and charged particle radiation (alpha and beta rays). X rays are generated by conventional radio diagnostic equipment and x ray therapy equipment and by high energy x ray tubes. Gamma rays are produced by cobalt and cesium bombs and by radioelements encapsulated in needles, tubes, or pearls, which may also emit, beta rays.

## 3. Overtime work shifts

Most of the medical professionals like the nurses, health attendants, technicians and the doctors are engaged in prolonged task and works which may be overtime hours and night shifts. The normal working hours are eight hours per day, 180 hours per month, but it is found out that at times the health workers are made to work for 200 and even 210 hours per week. In most cases

this happens due to shortage of staff in the hospitals. (Nwankwo *et al*, 2018)

#### **4. Lack of proper use of Personal Protective Equipment (PPE)**

Personal protective equipment (PPE) helps prevent the spread of germs in the hospital. This can protect people and health care workers from infections. The different types of PPE include surgical masks, respiratory masks, eye protection shields, face protection shields, and special clothing like aprons, gowns, head coverings, shoe covers. Badges like thermo-luminescent dosimeter (TLD) which helps to measure ionizing radiations should be renewed from time to time. In most of the hospitals, the PPEs are not adequately used or renewed which also leads to occupational hazards among the healthcare workers.

#### **5. Work related emotional stress**

This is another major health hazard which affects the hospital personnel, especially the students or young graduate nurse and clinical employees, which is derived from direct contact with the dying, with seriously ill children, and with sorrowful, anxious, and suicidal patients. Working in intensive care units also gives rise to situations that, depending on the personality of the individual, may cause pathological psychic disorders. Stalking of health professionals is another common hazard, yet it remains under-researched and underreported. It can lead to significant distress and psychiatric morbidity

### **Probable Solutions to Reduce Occupational Hazards in Hospitals**

1. In most of the studies, it is found that that patient handling is the leading cause of serious injuries among hospital workers. These injuries can be prevented by the hospitals by reducing associated costs and improving patient care. This can be done by undertaking comprehensive programs to promote safe lifting, repositioning, and transfer of patients. Safe and effective patient handling programs can include:
  - a) Equipment, like from the ceiling-mounted lifts to simple slide sheets that would be helpful in lateral transfer
  - b) Patient assessment tools
  - c) Training for caregivers and for dedicated lifting teams which are associated with patient lifting
2. A safety and health management system can be formulated to find and fix workplace hazards before employees are injured or fall ill. The following six core elements can be included in the system:
  - a) Hazard prevention and control
  - b) Program evaluation and improvement
  - c) Management leadership
  - d) Hazard identification and assessment
  - e) Education and training
  - f) Employee participation
3. Every hospital should evaluate and maintain access to a rich source of data from injury and illness records. These data can help the hospital management to identify the frequent nature

and source of injuries and other occupational hazards. This can also help the hospital authorities to carry out further research and correlate the incidents to probable solutions like change of work methods, purchase or renewal of new equipment and other necessary actions. This insight can help the hospital management to control the hazards that can lead to injuries and illnesses.

Additional recordkeeping is required for special cases like needle-sticks and sharps injuries, exposure to tuberculosis, occupational hearing loss and adverse reactions to work-related vaccinations.

4. The hospitals can formulate their own Health and Safety Committees which will be responsible to continuously evaluate the leading factors causing occupational hazards in the hospital and find out measures to reduce them. The committee can also be responsible to keep track of the incident report in the workplace.
5. The Human Resource Department of the Hospital can conduct counselling sessions for the employees who might suffer from work related emotional stress. The employees should be given clinical treatment or medical assistance if required.
6. The HR department should also supervise that the workload is universally distributed among the health workers and manpower requirements are fulfilled as and when required. This would help to reduce the work stress related to shortage of staff.

## Conclusion

Healthcare Personnel continues to face several occupational hazards in the hospitals. These hazards vary from physical hazards, biological hazards, and radiation exposure in the workplace to work related emotional stress. These hazards can not only reduce the productivity of the healthcare personnel, but also adversely affect the health conditions of the workers and in certain cases even leading to death. Thus, the hospital management needs to be proactive in evaluating the root cause of these hazards and subsequently make efforts to reduce their effect on the healthcare workers. This will also create a better work environment for the healthcare workers in the hospitals.

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