



Research Article

Hazard Identification and Risk Assessment (HIRA) in the Autopsy Activity: An Observational Study

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Abstract

Occupational Health & Safety measures are well comprehended in the industrial sector due to the Factories Act and local legislation. Such measures are not percolated in the health sector due to the lack of awareness, and very few studies available in this area. The range of services offered by a tertiary healthcare facility includes mortuary services. The medical staff and the relatives of the deceased may be at risk in mortuaries or post-mortem rooms. The study aimed to analyze existent practices and Occupational Health and Safety (OSH) measures in autopsy activity and to identify inherent hazards and associated risks. This is an observational study conducted at the mortuary of the Forensic Medicine Department, in a Government tertiary care hospital in Patna, Bihar (India). Standard Methodology of Hazard Identification and Risk Assessment followed from ILO publication. Biological risks include coming into contact with the deceased's bodily fluids and splashes, spills, and aerosols as a result of post-mortem room activities for the staff members involved in moving the body to the mortuary. The physical risks include slip-and-fall accidents and related injuries. Potential chemical risks include contact dermatitis and allergic asthma caused by exposure to formalin vapours during embalming

processes and medications/chemicals used by the deceased. The personnel are susceptible to a number of illnesses, including hepatitis, lung TB, hepatitis C, HIV, and COVID-19. exposure to radiation a possibility for the X-ray technician and assistance. Musculo skeletal conditions and injuries brought on by repeated action in the shoulder, small joints of the hand, and elbow are examples of ergonomic dangers. PPEs were rarely used consistently in most mortuary areas. The use of risk reduction techniques like replacement, engineering controls, administrative controls, and personal protective equipment (PPE) is necessary, as is periodic occupational health surveillance.

Keywords: Occupational Health and Safety, Autopsy, Occupational Hazards, PPE.

Introduction

Whether a person is working on a computer or in a wire rod mill, travelling to meet clients, or studying for an approaching test, they are all subject to occupational dangers. Some of these dangers can lead to occupational illnesses if they are neglected. By being aware of the hazards and taking appropriate preventative actions, the majority of occupational diseases can be lessened or avoided. To put it another way, there are hazards involved with every employment, but they can all be avoided.[1]

The goal of occupational health should be the adaptation of work to the individual and of the individual to his or her job, according to the Joint International Labor Organization/World Health Organization (WHO) Committee on Occupational Health, which made this declaration during its first meeting in 1950.[2] Occupational health and safety are essential in the healthcare sector, just as they are in any industrial or agricultural setting.[3] The classification of a

healthcare worker's job and the environment in which they work affect how exposed they are to dangerous substances.[4]The WHO estimates that there are 59.8 million healthcare professionals worldwide. One-third (19.8 million) of the workforce is employed in management and support, which includes personnel from auxiliary divisions like laundry, food, the centralized sterilization and supply department (CSSD), laboratory, mortuary, ambulance services, and administrative divisions. 39.5 million people, or around two-thirds, work in the health sector.[5]

The prevalence of needle stick injuries and workplace risks among healthcare workers (HCWs) are both shown by a number of studies that are now available.[6,7] There are, however, very few studies involving the mortuary department's workers.[8,9]The mortuary or post-mortem facility is a potential source of risks and hazards for the personnel and visitors of the deceased who are visiting it. The present study aims to analyze existent practices and Occupational Health and Safety (OSH) measures in autopsy activity and to identify inherent occupational hazards and associated risks.

Methodology

The present study was an Observational Study conducted at Patna, Bihar, a government tertiary care hospital with 1,000 beds. The study was undertaken between September 2020 to January 2023. A mortuary is attached to the Department of Forensic Medicine. Persons who were working in the Forensic Medicine department and gave consent to participate in the study were included in the study. The OSH management system was assessed using a Checklist for Basic Activities in Occupational Safety and Health (OSH) from the International Labor Organization website. Also, using data from the Health and Safety Authority (HSA) Ireland website and input from a subject matter expert, a checklist of occupational hazards in mortuaries was developed.[10] The questions were created using a review of the literature on the dangers experienced by workers in various professions. Occupational health experts

validated the checklist, and their recommendations were incorporated into the final form. Data was collected using the non-participatory Monitoring method. In order to record the work procedures and occupational safety measures that were in place there, the researcher made multiple excursions to the mortuary and watched autopsy-related activities that took place prior to, during, and after the postmortem. Employee interviews were also conducted. Workers' informed consent was acquired. In order to identify the variables influencing the proper usage of PPEs, a pre-tested interview schedule was used. In addition, a surprise visit was performed to see how PPE was used.

Qualitative information was captured during the visits. Personnel were immediately questioned to determine their reasons for not wearing PPE. Key informant interviews (KII) were carried out using a questionnaire that was semi-structured. The head of the forensic medicine department, an Additional professor in the forensic medicine department and a few workers at the mortuary served as the study's main sources of information

A Google form that allowed users to enter raw data was made, and the form's raw data was entered by users as individual responses, downloaded as Google Spreadsheets, and then the data was analyzed using Microsoft Excel. Frequency tables were used to describe the population's research variables. Based on responses to Google Forms, pie charts of several study variables.

Results

There were 19 people in the mortuary section, with 2 women and 17 men. [Table 1] Men aged 36 to 45 made up 35.3% of the population, while men aged 46 to 55 made up 23.6%. Males with 6–10 years of experience made up 41.2% of the total. [Table 4] Only 15.8% of mortuary workers had permanent jobs; the remaining 84.2% were temporary, contract, or casual workers. [Table 2] 100% of forensic experts were men. Only the assistant classification had a female representation of 100%. [Table 3]

Discussion

Employees who handle the body while it is being moved around the mortuary incur the danger of becoming ill from inhaling bodily fluids that have been aerosolized or from coming into touch with bodily fluids. The risk of contracting tuberculosis is believed to be between 100 and 200 times higher for employees in necropsy rooms than it is for the general population, according to research by Collins et al. [11,12] Moreover, they have a high chance of getting hepatitis B and HIV. These dangers are increased among technicians and professionals in India due to poor sanitation, especially among forensic medical specialists and mortuary workers. These risks include physical, chemical, and biological. During KII, the department head brought up this problem. It was found that none of the KII employees had received a Hepatitis B vaccination.

The participant was also exposed to the formaldehyde solution used in embalming, which can occasionally cause coughing fits as well as eye irritation and redness. Those in charge of transporting and loading the body must lift it over their shoulders and place it in the cold storage chamber. MSDs might result from this. Before interment, forensic professionals evaluated each unusual death. Just 9% to 10% of the bodies received at the mortuary are the consequence of

unnatural causes, as was noted during the KII with the Department Head.

It was observed that the personnel in charge of moving the body didn't wear the proper personal protection equipment during the action. The nurses said that they occasionally forget to put on their gloves and face masks. When shifts change and it is thought that they are not in danger since they do not frequently handle the body of the deceased. Because they didn't know how to get gloves or masks, the attendees and security officers didn't use them.

The hierarchy of control concepts which is usually seen in a common industrial setting where the occupational health management system is robust; is largely scarce in the healthcare area. Personal protective equipment is considered the last control measure in the elimination, substitution, engineering control and PPE to reduce occupational risk. Even the last one is also not adhered to strictly. No onsite emergency plan as well as no fire prevention plan is in place. No training on occupational health and safety was imparted to the stakeholders. There is no awareness in this area present. No training on fire extinguisher use was imparted to staff. No assembly point was designated for disaster or accident. No SOP (Standard Operating Procedure) was written or displayed on the shop floor.

Table-1: Age & Sex distribution of the Workers in the Forensic Medicine department

Age in Years	Sex		Total (%)
	Male	Female	
25 & Below (%)	3 (75)	1 (25)	4 (21.1)
26-35 (%)	3 (75)	1 (25)	4 (21.1)
36-45 (%)	6 (100)	0 (0)	6 (31.6)
46-55 (%)	4 (100)	0 (0)	4 (21.1)
56 & Above (%)	1 (100)	0 (0)	1 (5.3)
Total (%)	17 (89.5)	2 (10.5)	19 (100)

Table-2: Distribution of the Workers based on employment status

Employment Status	Sex		Total (%)
	Male	Female	
Permanent (%)	3(100)	0(0)	3(15.8)
Casual/Contractual/ temporary (%)	14(87.5)	2(12.5)	16(84.2)
Total (%)	17(89.5)	2(10.5)	19(100)

Table-3: Distribution of the Workers based on working category

Work Designation	Sex		Total (%)
	Male	Female	
Forensic Experts (%)	5(100)	0(0)	5(26.3)
Technicians (%)	1(100)	0(0)	1(5.3)
Assistants (%)	4(66.7)	2(33.3)	6(31.6)
Attendants (%)	7(100)	0(0)	7(36.8)
Total (%)	17(89.5)	2(10.5)	19(100)

Table-4: Categorization of the worker based on the Year of Experience

Years of Experience	Sex		Total (%)
	Male	Female	
Up to 5 Years	6(85.7)	1(14.3)	7(36.8)
6-10	7(87.5)	1(12.5)	8(42.1)
11-15	3(100)	0(0)	3(15.8)
16-30	1(100)	0(0)	1(5.3)
Total (%)	17(89.5)	2(10.5)	19(100)

Conclusions

A variety of Occupational Health and Safety Hazards unique to a Mortuary Section were discovered by the study. Healthcare professionals face ergonomic, physical, chemical, and biological dangers. It was discovered that environmental and physical dangers were very common in the post-mortem room. The dangers may be reduced by performing standardized and routine housekeeping duties. The proper and consistent use of PPEs was not always followed. Ongoing instruction, encouragement, and oversight will help to improve PPE use compliance. Plans are in place by educational institutions for the welfare of medical professionals. No onsite emergency plan and fire prevention plan is communicated to fourth-grade staff. Occupational Health and Safety Management System needs to be cultivated.

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