



Occupational Health & Safety Measures in the Mortuary of Forensic Medicine Department, IGIMS Patna

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Abstract

Introduction: Occupational Health & Safety measures are well comprehended in industrial sector due to Factories Act and local legislations. Such measures are not percolated in the Health Sector due to the lack of awareness, 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. **Objectives of the study:** To identify existing practices and Occupational Health and Safety (OSH) measures in a Mortuary and to assess the use of Personal Protective Equipment (PPEs) among Health Care Workers. **Material and. Methods:** This is a cross-sectional study in mortuary of Forensic Medicine Department, IGIMS Patna. A Guidance Check-List for Occupational Safety and Health (OSH) Basic Activities; from ILO website, used for the assessment of OSH management system [1] **Results:** The staff involved in moving the body to the mortuary are exposed to biological risks, including contact with the deceased's bodily fluids and splashes, spills, and aerosols as a result of post-mortem room activities. Injuries from slips and falls are the possible physical risks. Contact dermatitis and allergic asthma caused by exposure to formalin vapors in situations of embalming and drugs/chemicals consumed by the deceased are the potential chemical dangers. The workers are susceptible to HIV, Covid19, hepatitis C, pulmonary tuberculosis, and hepatitis. Radiation exposure risk for the X-Ray technician and assistant. Musculoskeletal conditions and repetitive stress injuries at the shoulder, elbow, and small joints of the hand are possible ergonomic dangers. PPEs use was not consistent in most areas of the mortuary. There is a need to do periodic Occupational health surveillance and to use risk reduction strategy by employing Hierarchy of controls like Elimination, Substitution, Engineering Controls, Administrative controls and PPE.

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

1. Introduction

Any person engaged in a job-related activity is susceptible to occupational hazards, whether they are working on a computer or in a steel melting shop, travelling to meet clients, or studying for an upcoming test. If ignored, several of these risks can result in occupational illnesses. Most occupational diseases are mitigated or prevented by knowledge of the risks and adequate preventive measures. In other words, there are risks associated with any job and they can all be avoided. [2]

The Joint International Labor Organization/World Health Organization (WHO) Committee on Occupational Health stated during its inaugural session, held in 1950, that the goal of occupational health should be the adaptation of work to the individual and of the individual to his or her job. [3] As in any industrial or agricultural context, occupational health and safety is crucial in the healthcare industry. [4] The categorization of a health care worker's employment and the setting in which they operate determine how exposed they are to hazardous agents (HCW). [5]

Worldwide, there are 59.8 million health care workers, according to the WHO. A third (19.8 million) work in management and support, including those in ancillary departments like laundry, diet, centralized sterilization and supply department (CSSD), laboratory, mortuary, ambulance services, and administrative departments. About two-thirds (39.5 million) provide health services. [6]

There are numerous research available that show: the frequency of needle stick injuries and workplace dangers among HCWs; [7,8] With regard to the staff of the mortuary department, there are, however, very few research. [9,10] For the personnel and visitors of the deceased who are visiting the mortuary, the mortuary or post-mortem facility is a potential source of risks and hazards.

OBJECTIVES OF THE STUDY

1. To identify existing practices and occupational safety measures in Mortuary of Department of Forensic Medicine, IGIMS Patna
2. To assess the use of PPE by the staff of Mortuary.

MATERIAL AND METHOD

Study design: Cross sectional study

Study area /Location: The study was conducted in a government tertiary care hospital with 1000 beds and a bed occupancy rate of almost 95% in Patna, Bihar. Specialty and super specialty services are offered by the hospital. The forensic medicine department has a mortuary attached to it. Every day, on average, one postmortem is performed.

Selection of the Study population:

Inclusion Criteria: A person who is currently employed in forensic medicine and gave their consent to take part in the study.

Study Period: The study was undertaken between December 2021 to November 2022.

Instruments used For Study: A Guidance Check-List for Occupational Safety and Health (OSH) Basic Activities; from International Labor Organization website, used for the assessment of OSH management system. Apart from it checklist of Occupational Hazards in mortuary developed with discussion about different activities with the domain expert and information contained on Health and Safety Authority (HSA)Ireland website. [11]. The questions were developed based on a review of the literature on the risks for the workers engaged in these occupations.

Validation of observation: Three occupational health experts validated the checklist, and their recommendations were incorporated into the final version. For the purposes of this study, it was field tested and verified.

METHOD OF DATA COLLECTION

1.Non-Participatory Observation: To record the work procedures and occupational safety measures in place there, the researcher made many trips to the mortuary and watched activities occurring before, during, and after the post-mortem.

2. Worker interviews: Workers' informed consent was obtained. To determine the elements affecting the proper use of PPEs, a pretested interview schedule was used. A surprise visit was also made to witness PPE usage in action.

3. Qualitative Data: The methods used to record the qualitative data are as follows:

1. During the visits, on-site discussion with workers was conducted to ascertain the causes of PPE non-use.
2. Using a semi-structured questionnaire, key informant interviews (KII) were undertaken.

The following individuals served as the study's primary informants:

- a) the head of the Forensic Medicine department;
- b) other teaching personnel in the Forensic Medicine department.
- c) Selected mortuary personnel

ANALYSIS OF DATA

A Google Form created to input raw data from participants and responses downloaded in Excel Spreadsheets and data analyzed using Microsoft Excel. Frequency tables were used to describe the study variables in the population. Pie charts of different study variables obtained from Google Form responses.

FINDINGS

I. A description of the mortuary's physical layout:

Based on the activities that take place in each sector, the mortuary has been separated into numerous sections.

This includes:

1. Receiving Area-An area where the deceased are received from or outside of the hospital.
2. Cold Storage Area—A location where the mortuary stores the deceased bodies it receives. The body is kept in storage until it is properly disposed of. The body is given to the family members in all cases of natural death, whereas those involving unnatural deaths are kept in storage until the forensic experts can perform the postmortem procedure.
3. Post-mortem Procedure Room- This room features a hallway and a bathroom. The post-mortem apparatus and mortuary table are located in the hall, which also has a restroom where the staff can wash up and take a bath after the process.
4. Common Area-This area is shared by the post-mortem rooms and the cold storage area. Before being moved to a storage area or post-mortem room and before being given to the attendants, the bodies of the deceased are temporarily placed in this location.
5. Prayer Area - The body is temporarily positioned here to allow the family to carry out rituals.
6. Doctor's Room – At this location, forensic professionals communicate with law enforcement officials as well as the deceased's friends and family members.
7. Room for mortuary technicians and attendants

II. Biological Hazards of mortuary department.

The body fluids present in the deceased's body when being transferred to the trolley in the ward and to the mortuary expose the people involved in the transportation of the deceased (body) to biological hazards.

- The staff is at danger of exposure to bodily fluids while transporting (loading) a body in the car. The nursing staff and the deceased's companions need to maneuver the body into the vehicle when it is small. They run the danger of contracting infections because of their intimate contact with bodily fluids.
- The exposure to body fluids (spills and splashes) during the post-mortem procedure places the mortuary attendants, the forensic expert, and the mortuary technician at risk of contracting an infection. The employees who are providing care may inhale the aerosols that are being produced from decomposition of dead body.

The staff members are vulnerable to cutting injuries, particularly while helping to dissect the body for inspection using a scalpel, cutting the costo-chondral joints to open the chest, using a bone-saw to cut the skull, and suturing the skin to close the chest, skull, and abdominal cavities. While moving the body from one location to another, taking anthropometric measures, and prepping the body for transfer, the attender's exposed body parts (part of the forearm) come into contact with the body fluids.

III. Physical and the environmental hazards at the mortuary

The workers are exposed to the odors in the cold storage room and gases created by the decomposition of the remains.

The workers are at risk of slips and falls in the post-mortem room during the process if the floor is damp.

IV. Ergonomic Hazards at the mortuary

- It was noted that the persons engaged maintain awkward/bad postures and stances and utilize force to twist their trunks as a result of the vehicle's limited space, which could lead to back injuries.
- When moving a body from one location to another, performing a post-mortem, and preparing the body for transfer to the family, the personnel are at risk for MSDs.
- RSIs could result when using a bone saw to cut the skull.

Employing an ordinary saw to cut the skulls puts them at risk for repetitive stress injuries (RSIs), in addition to the risk of cuts from using sharp instruments throughout the autopsy.

V. Chemical Hazards at mortuary

The employee stated that while making the formalin solution and embalming the body, they occasionally have severe coughing fits, breathing problems, and eye irritation.

Rarely, personnel may be exposed to the poisonous drugs or chemicals that patients consumed while receiving treatment in a hospital or at home. The specialists claim that it is quite uncommon.

VI. Personal Protective Equipments (PPEs)

- During the activity, those participating in the transportation of the deceased (body) did not wear the proper PPE.
- The medical personnel who were with the deceased's (body's) body wore aprons, gloves, shoes, and masks. Gloves and mask usage, however, varied widely. The explanations given were that they frequently forget when changing shifts due to urgency and when moving a child's body because relatives typically handle it themselves.
- Because it is assumed that the security officers stationed at the mortuary do not handle remains, they were not provided with masks, gloves, or aprons to wear. However, in actuality, they do help with the transfer of bodies as and when necessary.
- The employee wore shoes and a set of disposable gloves. The foul smell of the dead kept here is also exposed to them. The mortuary assistant and technician were seen changing into temporary plastic aprons that only covered the front of the body while wearing masks and throwaway plastic clothing during the post-mortem operation. They lacked boots and goggles.

VII. Characteristics of workers in the mortuary

There are 19 persons in mortuary section in which 17 were males and 2 were females. [Table-1][Chart-1]. Among males 35.3 % were in 36-45 year age groups followed by 23.6 % males in 46-55 year age group. 41.2% of males were in 6-10 year experience category. [Table-4][Chart-4]. Only 15.8% of mortuary worker were permanently employed, 84.2 % of the employee were casual, contractual or temporary. [Table-2][Chart-2]. Among Forensic Expert 100 % were male. 100 % Females were represented in assistant designation only. [Table-3][Chart-3]

DISCUSSION

Occupational Hazards

The staff members who move the body around the mortuary face the risk of getting sick from coming into contact with bodily fluids or inhaling aerosolized body fluids. A study by the Collins et al [12,13] have highlighted that the risk of developing tuberculosis for workers in necropsy rooms is thought to be between 100 and 200 times higher than that of the general population. They are also at a significant risk of developing hepatitis B and HIV infections. These risks are higher among professionals and technicians in India due to a lack of sanitation, and they are particularly high for forensic medical experts and mortuary technicians. These hazards include biological, chemical, and physical risks. During KII, the Head of Department

made a reference to this concern. It was discovered that none of the employees in the KII had received the Hepatitis B vaccine.

The attendee was also exposed to the formaldehyde solution used in embalming, which can occasionally cause coughing fits, eye irritation, and redness.

The individuals responsible for the body's transportation and loading into the storage area must hoist the body over their shoulders to load into the cold storage chamber. MSDs might result from this.

Forensic experts were consulted to perform post-mortems on all unnatural deaths.

Only 9% to 10% of the bodies received at the mortuary are the result of unnatural causes, as was noted during the KII with the Department Head.

Personal Protective Equipment

It was noted that the people responsible for the body's transportation did not wear the proper PPE during the activity. The following list of causes:

The nurses admitted that they occasionally forget to put on their gloves and face mask.

When shifts change, as well as when it is thought that they are not in risk because they don't frequently come into contact with the dead person's body.

Because they didn't know how to acquire gloves and masks, the security staff and attendees didn't utilize them.

Table-1: Age & Sex distribution of the Workers in 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)

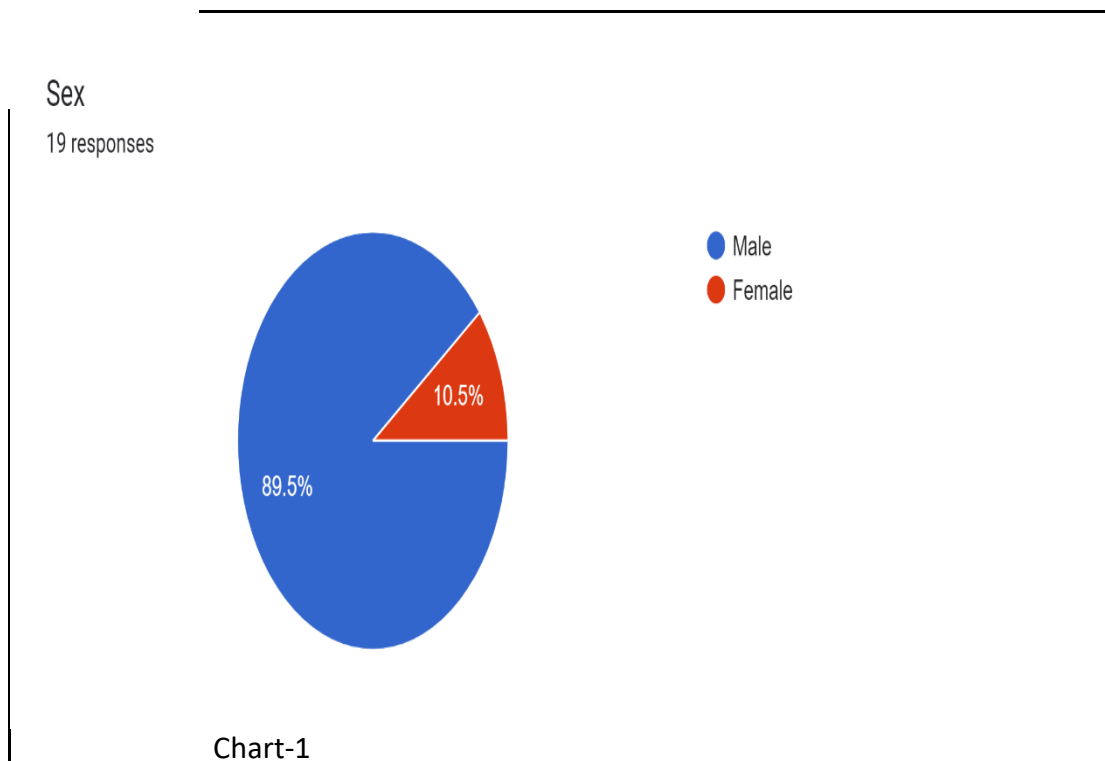


Table-2: Distribution of the Workers based on employment status

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)

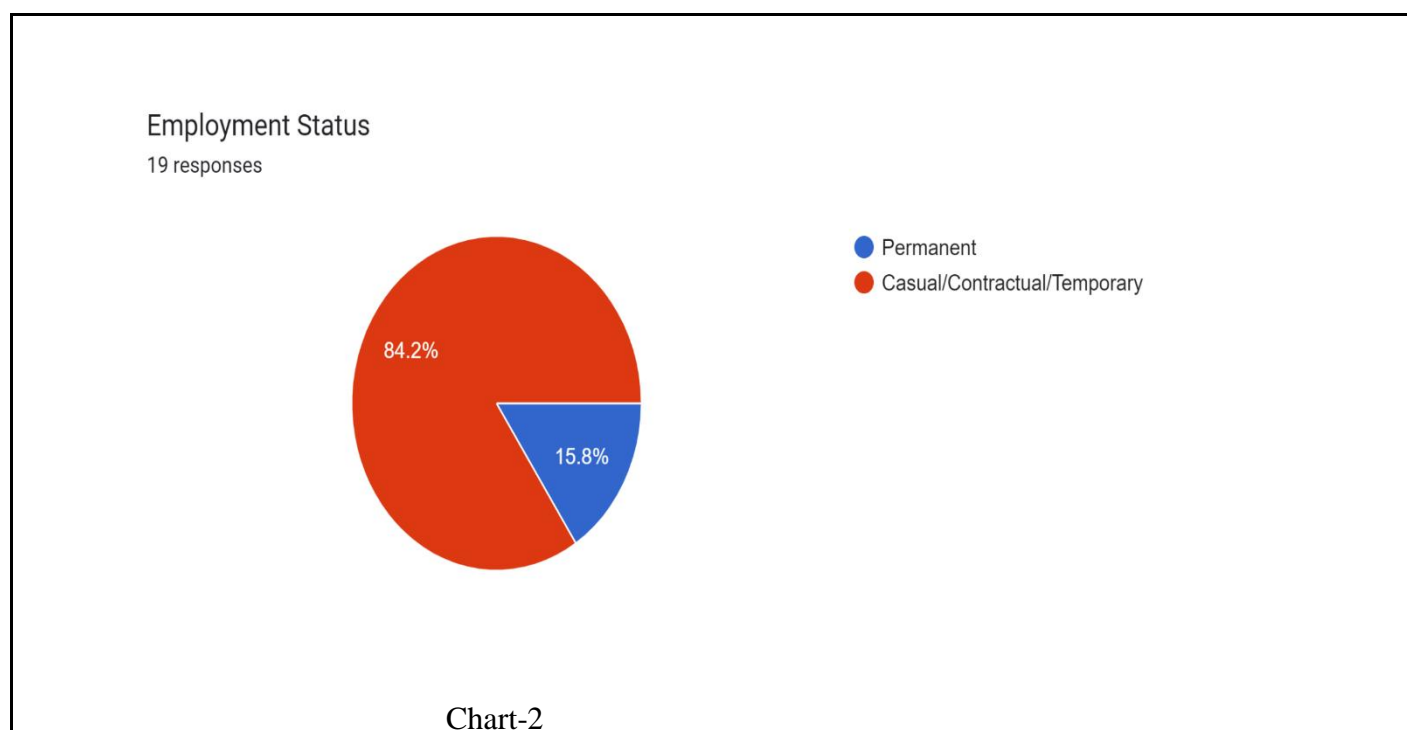


Table-3: Distribution of the Workers based on working category

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)

Work Designation

19 responses

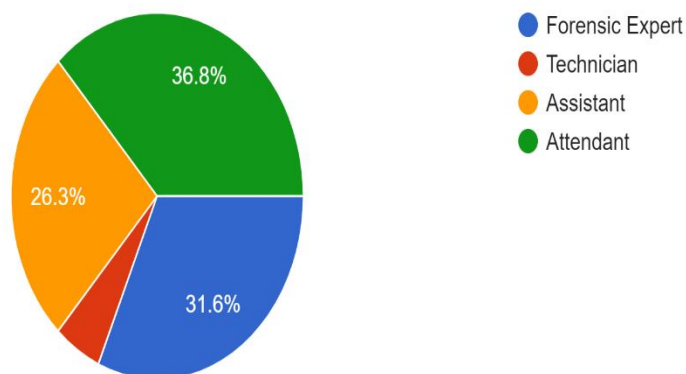


Chart-3

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)

Experience in completed Years

19 responses

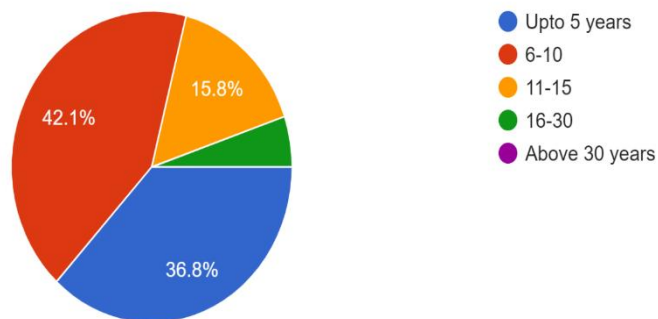


Chart-4

CONCLUSIONS

1. The study identified a number of Occupational Health and Safety Risks specific to a Mortuary Section.
2. Ergonomic, physical, chemical, and biological hazards were posed to healthcare professionals.
3. The Post-mortem Room was found to have a high prevalence of environmental and physical hazards. Regular and standardized housekeeping tasks may be able to lessen the risks.
4. The consistent and appropriate use of PPEs is not always adhered to.
5. Regular teaching sessions, encouragement, and supervision will help to increase compliance with regard to PPE use.
6. The educational institutions have plans for the health care professionals' welfare.

Acknowledgement: Staff of Forensic Medicine Department, IGIMS Patna

Source of Funding: Self

Conflict of Interest: Nil

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