

Original Research Paper

A Profile of Workplace Accidents and Injuries at Bengaluru

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Abstract:

Workplace related injuries are the most important cause of work absence, disability retirement, mutilation, and even mortality.^{1,2} A detailed study of workplace accidents and fatal injuries at workplace provides valuable data for implementing effective preventive measures to reduce the burden of injuries related mortality and morbidity and to strengthen legal measures. Vydehi hospital, a tertiary care hospital, receives most of the medico-legal cases from eastern part of Bengaluru, both for treatment and autopsy services. This part of the city is considered as one of the major hubs of IT sector, concentrated by many migrated laborers from various parts of the country, who get employed at the construction sites as laborers. An autopsy study of deaths due to fatal injuries at workplace was conducted with an aim to know the incidents, age, sex, details of education, occupation wise distribution, availability of preventive measures, events leading to patterns of injuries and cause of death. Data in the current study was collected from all the cases of fatal injuries at workplace autopsied for a period of 5 years from September 2007 to August 2012. Male and young workers constituted the bulk. Majority of the victims were construction laborers. Majority of cases lacked pre-recruitment checkups, regular medical checkup and first aid facility at workplace. Falls from height was common type of event, followed by fall of objects. Protective measures were not available in most of the cases.

Key Words: Workplace Injuries, Construction Laborers, Fall from Height, Protective Measures

Introduction:

The World Health Organization (WHO) defines work-related injury as an epidemic problem in the field of public health in developing countries.^{2,3} According to the International Labor Organization (ILO), 1 out of 10 workers is involved in these injuries annually, and 5% of national labor days are lost.^{4,5} Accidents in any form or degree inflict many economic damages for the worker, employer, and the society.

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This damage can directly or indirectly affect the individual and society^{6,8} although many attempts are made to reduce the occupational morbidities and mortalities.^{9,10} It also compromises the safety and health of the laborers, due to economic factors and leads to an increase in the number of workplace accidents and disease.¹¹ Today's intense urbanization, which has affected all the major cities in the recent past, has its own role to play in causing fatal injuries at work place. There is an alarming increase in fatal work place injury deaths in Bengaluru city, which is the hub of all developmental activities due to changing patterns of social, cultural, economic development. In this altered scenario there is very much a need for studying various patterns of deaths through skillful analysis and to incorporate preventive strategies to avert further tragedies. A prompt attempt has been made to study the same.

Materials & Methodology:

The data was collected from cases of fatal injuries at work place from 2007 to 2012,

autopsied at the mortuary of the department of Forensic Medicine and Toxicology, Vydehi Institute of Medical Sciences and Research Centre, Bengaluru. The approval for the study was obtained from the college Ethics Committee. The particulars of deceased in the form of age, sex, occupation, education, work experience, events leading to fatal injuries, protective measures, along with the cause of death are studied, based on the autopsy reports, police records and information from relatives. It was an observational study, to collect data regarding magnitude and type of problems involved. A descriptive and inferential statistical analysis was carried out and Fisher Exact test was used to find the significance of study parameters.

Observations and Results:

A total number of 848 autopsies were carried out over a period of 5 years from September 2007 to August 2012 in the mortuary of the department. There were 78 cases of deaths due to fatal injuries at workplace constituting 9.2 % of unnatural deaths at our centre. (Figure 1) Of these, 73 [93.6%] were males & 5 [6.4%] were females. (Figure 2)

Figure 1: Represents burden of deaths due to fatal workplace injuries.

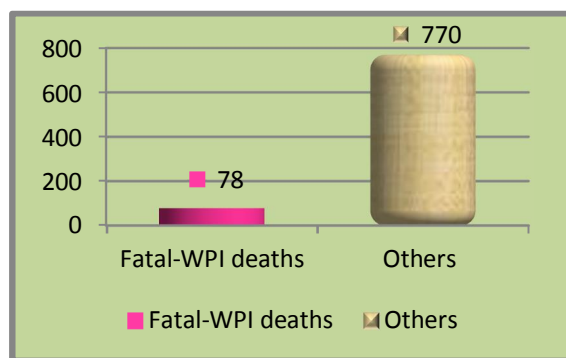
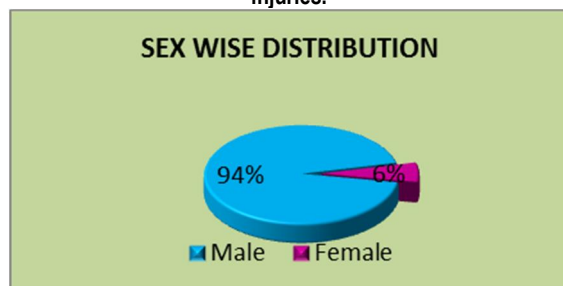
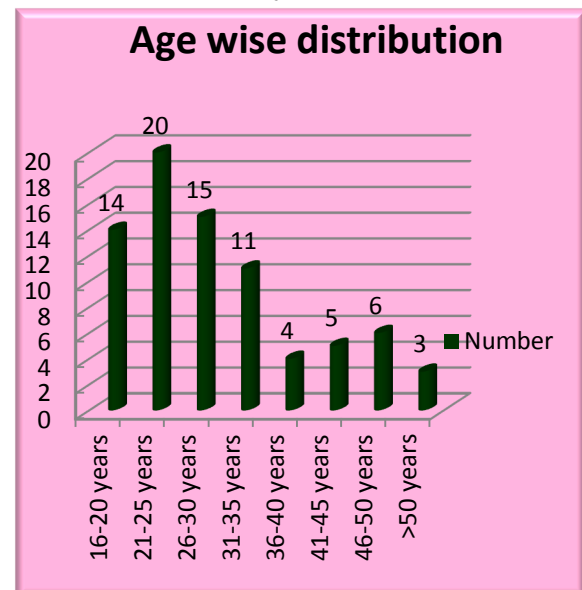


Figure 1: Shows the sex wise distribution of fatal Workplace injuries.



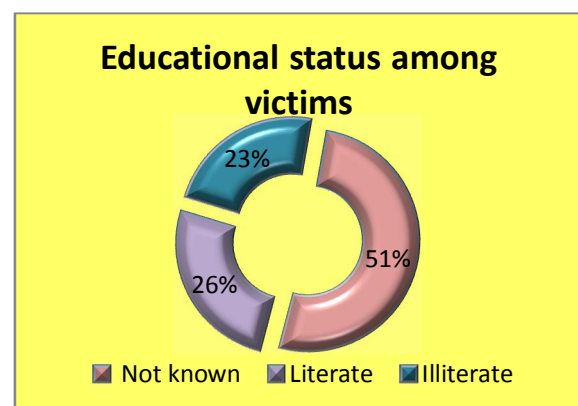
Individuals were grouped in a range of 5 years to get the accurate age of incidence. Highest incidence of 20 cases [25.6%] was noted in the age group of 21 to 25 yrs, followed by 15 cases [19.2%] in the age group of 26-30 yrs and 14 cases [17.9%] in the age group of 16 to 20 yrs. (Figure 3)

Figure 3: Shows age wise distribution of fatal Workplace injuries.



Details of education were known only in 38 cases, of these, 20 [52.6%] were literate. & 18 [47.4%] were illiterate. (Figure 4)

Figure 4: Shows educational status among victims of fatal Workplace injuries



Majority of the fatalities [69.2%] took place at the construction site involving the laborers. (Figure 5) 26 individuals had a work experience of 6 months to 1 year, followed by 24 with 1 to 2 yrs experience. (Figure 6)

Figure 5: Shows occupation of the victims

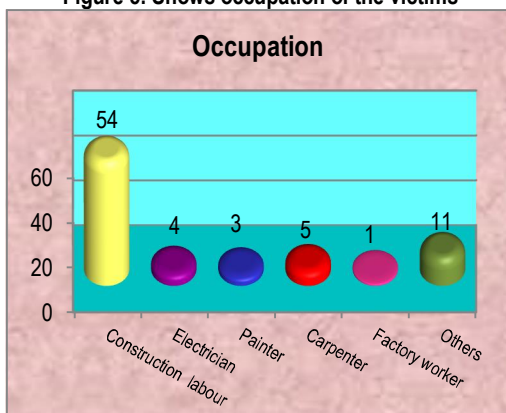
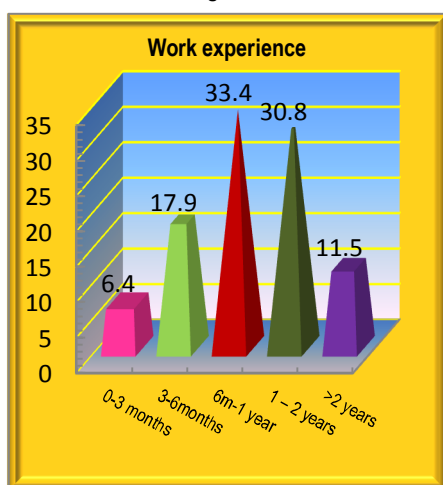


Figure 6: Shows distribution according to work experience among victims.



22 deaths [28.2%] occurred between 12 noon to 4 pm, followed by 21 deaths from 4 pm to 8 pm & 20 deaths between 8 am to 12 noon. (Figure 7)

According to the history, majority of deaths were due to fall from height [59%], followed by fall of objects [15.4%], and electrocution [15.4%], respectively. 2.6% were due to burns, 3.8% due to combination of fall and electrocution/electrocution and burns. 1.2% due to drowning. (Figure 8)

Majority of deaths were due to shock and hemorrhage [46.1%], followed by shock [10.3%]. Coma and head injury constituted 10 and 8 cases, respectively (Figure 9). Protective measures at workplace were available in 5 [6.2%] cases. Of these, 3 cases [3.8 %] had utilized the facility and 2 [2.6%] had not. For 44 cases [56.4%], details were not known (Figure 10).

Figure 7: Shows time of incidence

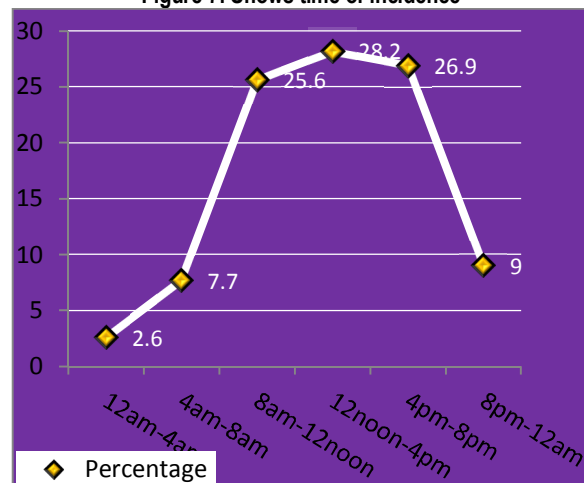


Figure 8: Shows history of incident

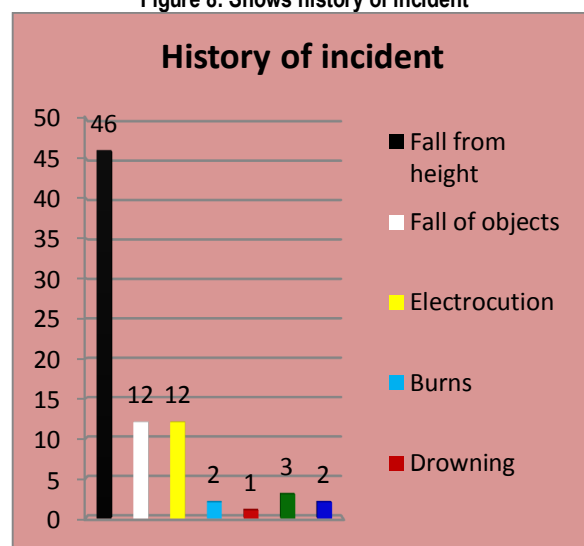


Figure 9: Shows causes of death.

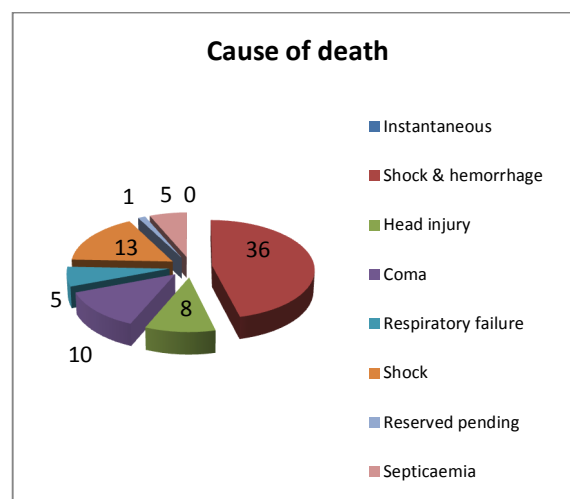
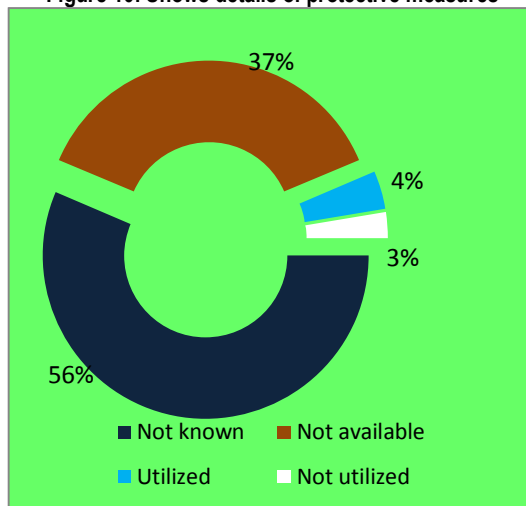


Figure 10: Shows details of protective measures



Discussion:

In the present study, few salient and interesting observations were recorded and these have been analyzed, discussed and compared with findings of other workers in similar studies.

Of a total of 848 autopsies conducted at Vydehi hospital, 78 cases of fatal workplace injuries were noted, which constituted 9.2% of unnatural deaths. A study conducted at Aurangabad city observed that fatal occupational injuries accounted for 6.85% and in a study in Qatar, the rate was 8.6%.^{12,13}

Male predominance [93.6%] was noted in our study which is consistent with studies done at Qatar, Aurangabad and Uttaranchal.¹²⁻¹⁴

The age group of the victims in our study ranged from 18 years to more than 50 years. Maximum number of deaths occurred in the age group of 21 to 25 years [25.6%], followed by 26 years to 30 years [19.2%]. The rate is in accordance with the study done at Victoria Hospital, Bangalore,¹⁵ where maximum number of deaths occurred in the age group of 18 years to 27 years [53.1%], followed by 28 to 37 years [27.3%]. Similar findings were also observed in another study done at Aurangabad which showed the age range as 21 ñ 30 years [31.5%] and in Uttaranchal, 18 ñ 36 yrs [64.28%].^{13,14,16.}

Construction sector accounted for more fatal work injuries than any other industry, according to the Bureau of Labor Statistics and this correlates with our study, where in 69.2% fatalities were among construction laborers. In

another study, majority of the accidents occurred in construction sectors (48.4%) and demolition sites (16.4%). Accidental falls and being struck by falling objects accounted for 1 in 10 cases. Males and those working at construction were at the greatest risk.¹⁷⁻¹⁹

In our study maximum number of deaths occurred during the day, with time period between 12 noon to 4 pm [28.2%], followed by 4 pm to 8 pm [26.9%] and it correlates with a study at Bangalore where maximum number of industrial accidents occurred during 12.00 pm to 4.00 pm (43.8%). These findings are also similar to the findings observed by them where time of incidence was 12 noon - 6 pm in 34.57%.^{15 19}

Majority of the victims had a work experience of 6 months to 1 yr [33.4%], followed by 1 yr to 2 yr [30.8%] and this is similar to their study where majority of the accidents at workplace involved workers having 6 months to 2 years of work experience [44.5%]. According to that study, approximately 50% of the employees had accident in first six months of employment, followed by 23% in the next months and 3% subsequently.^{15, 20}

In our study, details of protective measures were not known for 56.4 %. Protective measures at workplace were available in 6.2 % cases. Of this, 3.8 % had utilized the facility and 2.6 % had not utilized the facility. According to their study, equipment insufficiency has doubled as a cause of work place accident. In another study, similar findings were observed where in 88.3% of the cases safety equipments were not available and in 10.2% of cases safety equipments were utilized, however they could not prevent the accidents which can be attributed to equipment failure.^{21.}

The findings in our study are in accordance with the report which states that an effective training and proper recruitment procedures can reduce number of injuries and death and illness. Lack of these facilities had a clear impact on the outcome of fatalities in our study.^{22.} First aid facility was not available in 20 cases, 1 case had not undergone and 2 cases had undergone first aid facility. In the remaining cases, details were not available. In a similar study, it was observed that 99.2% of the cases, first aid facility as well as first aid training were

not available. According to their study it was observed that the first aid facilities and first aid training had positive effect on occupational safety and health behaviors of the workers.²³ the severity of the injury, lack of first aid at worksite, longer distance to travel for medical facilities probably contributed for death within 1 hour after accident.²⁴

In our study, majority of deaths were due to fall from height (59%); 15.4% each due to fall of objects and electrocution. 2.6 % were due to burns, 3.8 % due to combination of fall and electrocution/electrocution and burns and 1.2 % due to drowning. In their study, falls, being struck by falling objects and machinery were implicated as leading causes of work related injury and death. Similar findings were observed in another study where, 52.4% of the cases were due to injuries, followed by electrocution, burns, traumatic asphyxia and the least were due to drowning.²⁵

A rare case of death due to suffocation as a result of fall of mud at construction site was reported by them which correlate with our study where one similar case was found among 78 cases.²⁶ Causes of death in 46.1% were shock and hemorrhage, followed by coma due to head injury. 23.1%. This is consistent with the other two similar studies.^{15,16}

External injuries frequently noted were abrasions and combinations of other injuries. Head and other parts of the body were commonly injured. Fissure fracture of base of skull is common among head injuries.

Conclusion:

Fatal injuries at workplace constituted 9.2% of unnatural deaths. Majority of the victims were male, and the incidence was common among the 21 to 30yrs. Majority of the victims were construction laborers, having work experience of 6 months to 2 yrs. Falls from height was the common type of event leading to fatal injuries, which adds to the few reports on work related injuries in India, a developing country with high immigration from rural to urban areas, where immigrants have little training and experiences and therefore enter job opportunities. That is why the incidence of work-related injuries among developing countries in

construction workers is on rise. Majority of the cases lacked pre-recruitment medical checkup, regular medical checkup and first aid facility at workplace. Protective measures were not available in most of the cases. People working in the industries prove to be inadequate in using proper protective measures. Thus enforcement and use of proper personnel protective equipment will decrease the incidence of deaths to a considerable amount. The results confirm that the gender, age and accident types, medical checkup, protective measures in the workers were significantly different in incidence rates and mortality rates.

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