

PROFILE OF OCCUPATIONAL INJURIES REPORTING TO THE EMERGENCY OF A TERTIARY HOSPITAL IN BANGALORE-AN OBSERVATIONAL STUDY

Nikhil Paul¹, Santosh Pandey², Keerthana Manoharan K K¹, Archu M J¹

Received : 06/05/2025
Received in revised form : 24/06/2025
Accepted : 12/07/2025

Keywords:

Occupational injuries, needle stick injury, occupational hazards, mechanical factors, mode of injury.

Corresponding Author:

Dr. Archu M J,
Email: archu.mj@manipal.edu

DOI: 10.47009/jamp.2025.7.4.80

Source of Support: Nil,
Conflict of Interest: None declared

Int J Acad Med Pharm
2025; 7 (4); 429-433



¹Department of Emergency Medicine, Kasturba Medical College Mangalore, Manipal Academy of Higher Education, Manipal, India.

²Department of Emergency Medicine, Maharaja Agrasen Hospital, New Delhi, India

ABSTRACT

Background: Occupational hazards account for 2.3% of Disability Adjusted Life Years (DALY) lost in middle-income nations. Only the most severe and incapacitating injuries are reported, although work-related traumatic fatalities and injuries are simpler to detect than chronic illnesses or disease-related deaths. Because of the enormous growth of the informal labour sector brought on by economic globalization, it is becoming more and more difficult to monitor work-related injuries in emerging nations. Aim of this study was to assess epidemiology of occupational injuries and related factors. **Materials and Methods:** Every patient who arrived at the emergency room with work-related injuries was chosen for the study. Age group, sex, type of injury, mechanism of injury, part of body affected, time of day of injury, type of work, educational background, professional training, addictions, time after injury to present to emergency room, effectiveness of first aid provided at work, and degree of morbidity were all taken into consideration when classifying the patients. Data analysis and compilation were completed. **Result:** According to our study the mean age group of workers was 30.95 years. 65.2% of those who were injured were males. Most of the injuries occurred at 12 PM – 6PM (48.2%). Unskilled workers were found to have the greatest number of injuries (28.6%). In our study upper limb (61.6%) is the most affected part of the body. **Conclusion:** We concluded that to prevent workplace injuries people should be taught about safety procedures. Additionally, needle stick injuries were a significant issue among medical personnel that required investigation.

INTRODUCTION

Occupational injury is any personal injury, disease or death resulting from an occupational accident; an occupational injury is therefore distinct from an occupational disease, which is a disease contracted as a result of an exposure over a period of time to risk factors arising from work activity.^[1]

Work conditions, age, educational status and safety training, experience, smoking, alcohol, psychosocial factors, shift of work, speed of work are all designated as responsible factors.^[2]

Majority of occupational injuries occurs in developing countries where people involve in occupations like agriculture, mining, construction works and other informal works. Around the world the statistics of occupational injuries are based on formal sector occupations. But majority of injuries occur in informal sector. In a developing country like India where most of the workforce belongs to the

informal sector, the statistics tend to underestimate the burden of occupational injuries.

Common modes of occupational injuries are contact with electrical voltage, high temperatures, hazardous substances; drowned in liquid, buried under solid, enveloped by gas or airborne particles; fall or crash into a stationary object; struck by objects in motion; contact with sharp, pointed objects; trapped or crushed by objects; acute overloading of body, physical constraint; bites, kicks, blows, etc. From animals and human beings.^[3]

Occupational hazards contribute to 2.3% of Disability Adjusted Life Year (DALY) lost among middle income countries.^[4] Work-related traumatic fatalities and injuries are easier to identify than chronic diseases or deaths from disease but only the most disabling and serious injuries only gets reported.^[5] surveillance of work-related injuries in developing countries is increasingly more difficult due to the rapid expansion of the informal work sector caused by economic globalization.

It is estimated that 100,000,000 occupational injuries occur in the world per year which leads to 100000 deaths according to the same study Indian data shows a total of 17,000,000 nonfatal and 45000 fatal injuries per year.^[5]

The purpose of the study is to evaluate the occupational injuries presenting to a tertiary care hospital and interpret the risk factors.

MATERIALS AND METHODS

We conducted this observational study after getting clearance from the institutional ethical committee from August 2016 to September 2018. All the study participants were informed about the study and consent was taken. Aim of this study was to assess the epidemiology of occupational injuries in patients in a tertiary care hospital in Bangalore. Our objectives were to analyse outcome variables such as type of occupation, educational qualification, mechanism of injury, time of injury, and part of the body affected

Study was conducted at Bangalore Baptist hospital, a tertiary care centre. We included patients presenting to emergency with acute injuries related to work. Exclusion criteria included patients coming with occupational medical illnesses of longer duration Sample size was calculated based on a previous study assuming the prevalence of falls as 30% 6 with a precision of 7% the sample size is calculated as 112 at 95% confidence interval level.

All patients presenting to emergency department with occupational injuries was selected for study. Selected

patients were explained about the study and the advantages and disadvantages were discussed. Informed consent was taken (verbally from them in the best understood language). Classification was done, based on age group, sex, type of injury, mechanism of injury, part of body affected, time of the day when injury occurred, type of work, educational qualification, professional training, addictions, time taken after the injury to present to emergency department, adequacy of first aid given at workplace and extent of morbidity. Data was compiled and data analysis was done.

Baseline variables were checked for comparability between the two arms. The outcome variables were checked for normality using histogram. The mean pain score before and after the study was compared using paired t test and the difference between the two groups were assessed using student t test. Chi square and Fischer's exact test were employed to compare distribution of qualitative data. Statistical significance was accepted at value less than 0.05.

continuous variables were presented as means (Standard Deviation (SD)). Categorical variables were expressed as actual numbers and percentages. Statistical analyses were performed using the Statistics Package for Social Scientists (SPSS: windows version 16.0.)

RESULTS

The average age group of injuries was 30.95 (10.73). Out of all the patients 58.9% were below the age of 30 whereas 2.7% of people were above the age of 60.

Table 1: Distribution of study subjects according to their age group (n = 112)

Age (in years)	No.	Percent
≤ 30	66	58.9
31-40	29	25.9
41-50	11	9.8
51-60	3	2.7
>60	3	2.7
Mean (sd)	30.95 (10.73)	
Range	18-78	

Table 2: Distribution of study subjects according to the gender (n=112)

Gender	No.	Percent
Female	39	34.8
Male	73	65.2

It was found that 65.2% of total injured were males and the rest females. The male to female ratio was 1.8:1

Table 3: Distribution of study subjects according to the occupation (n = 112)

Occupation	No.	Percent
Skilled worker	24	21.4
Semiskilled worker	10	8.9
Unskilled worker	32	28.6
Professional	20	17.9
Semi-professional	21	18.8
Farmer	5	4.5

The distribution of injured according to the occupation shows that unskilled workers accounted for (28.6%) followed by skilled workers (21.4%),

semi-professional (18.8%), professional (17.9%), semi-skilled workers (8.9%) and farmers (4.5%)

Table 4: Distribution of study subjects according to the mechanism of cause of injury (n = 112)

Mechanism of injury	No.	Percent
Animal bite	9	8.1
Burns & corrosions	3	2.7

Electric shock	5	4.5
Falls	24	21.5
Needle stick injury	41	36.6
Sharp equipments	30	26.8

In the mechanism of cause of injury, sharp equipment caused 26.8% of the injuries, whereas needle stick injury caused 36.6% followed by falls (21.5%). Other

injuries like electric shock (4.5%), animal bite (8.1%) and burns and corrosions (2.7%).

Table 5: Distribution of study subjects according to outcome (n=112)

Outcome	No.	Percent
Admitted from emergency department	21	18.8
X ray/ ct scan done	40	35.8
Operative procedures done	12	10.7
Discharged from emergency dept	87	77.6
Deformity	11	9.8
Death	1	0.89%

Based on the outcomes of the injured, it is identified that 77.6% discharged from emergency department and the rest were admitted. Out of the workers 35.8% injured got their x-ray and CT scan done. Operative procedures done in 10.7% of workers and deformity were present in 9.8% of them. There was one death due to occupational injuries.

DISCUSSION

We analysed occupational injuries reported to emergency department in a tertiary hospital in Bangalore. The number of occupational injuries reported during the study period was 112. According to our study the mean age group of workers was 30.95. Maximum number of patients belonged to the age group 18-30 years followed by 31-40 years which accounted for 25.9%. Only 2.7% of people were found to be above the age of 60. This was consistent with the study conducted in the United States by Jackson *et al*,^[7] in 1998, in which 55% of the injured were found to be under the age of 35. Other studies like the one done by Celik *et al* in Turkey in 2013 also suggest that the maximum number of occupational injuries belongs to the young age group.^[8] This can be attributed to lack of experience, alcohol use, risk taking behavior and increasing unemployment pushing the youth to go for hazardous jobs without adequate personal protection. The next parameter which was studied was the gender. The results shows that 65.2% of those who were injured were males. The studies conducted all over the world suggest the same finding uniformly. According to the same study by Jackson 11770% of injured were males and according to the study by Celik *et al* 93.4% were males.^[8] According to another study conducted by Sahyan *et al* in Turkey the male to female ration was found to be 11.54:1. These data can be explained by the fact that in the informal work sector most of the workers are males.^[9]

It was noted that there is no impact on duration working hours on incidence of occupational injuries. People working in normal working hours 8 (47.3%) to 7 (17.9%) working hours per day were the most injured. Long working hours like 10 (13.4%), 11

(0.9%) and 12 (11.6%) contributed below 15% of total occupational injuries. Adding on to the above study on working hours per day, most of the injuries occurred at 12 pm – 6pm (48.2%). These are the usual working timings of most of the workers. Odd hours such as 12 am-6 am accounted only for 3.4% and 6 pm- 12 am accounted for only 14.3%. On considering the educational status of the workers, 50% of the workers had school level education, 30.4% were graduates and 12.5% were illiterates. Though there were a few illiterates in the study group, the maximum injuries were present in workers who just had their primary school education. This clearly shows that education is associated with the risk of occupational injuries.

Unskilled workers were found to have most number of injuries (28.6%). The injuries among farmers were only 4.5%. This shows that the informal work sector which employs a lot of unskilled labourers plays a role in the increase in occupational injuries. The injuries among farmers suggest that many injuries are under reported. It was also found that most of the injuries among farmers were snake bites.

Average monthly income of the workers was identified as 20674.3 rupees. But most of the injured had a monthly income less than 10000 rupees. This has an impact on the workers because the hospital expense is often huge for them to meet. Most of the workers don't go for the proper treatment and end up in deformities and reduced quality of life.

Mechanism of cause of injuries was considered. The most number of injuries other than needle stick injuries belonged to sharp equipment. Together they accounted for 63.4 % whereas sharp equipment alone caused 26.8% of injuries which was followed by falls (21.5%), animal bite (8.1%), electric shock (4.5%) and burns and corrosions (2.7%). This was correlating with the study conducted by Jackson in the US where 50% of injuries were due to contact with equipment.^[6] According to a study conducted in Saudi Arabia by Al-Dawood *et al* in the year 2000 the most common type mechanism of cause of injury were falls(33.4%) followed by tool related injuries(23.9%).^[10]

According to the study on type of injury puncture wounds accounted for 40% followed by cut lacerated wounds (27.7%). Fractures were considerably less (12.5%). Other minor injuries were bruises and contusions (6.3%), burns (7.1%). About 2.7% of the study population had multiple types of injuries. According to the study conducted by Jackson et al, the types of injuries are lacerations (22%), punctures (4%), amputations (1%) together which constituted 25% which was followed by contusions and bruises (22%).^[7] the statistics looks similar according to both studies.

In our study upper limb (61.6%) is the most affected part of the body according to the study, followed by lower limb (23.2%), thorax (8.9%), head (7.1%), eye (6.3%) and abdomen (0.9%). According to the study done by Celik et al in Ankara, Turkey the most common affected body part was upper limb (53.7%) followed by lower limbs (15.3%).^[8] According to Al-Dawood, the most common injured body part was hands and fingers (32.1%) followed by multiple parts (20%) and lower limbs (20.5%).^[7] According to the study conducted by Sahyan mb et al in Edirne, Turkey most common body part affected was extremities (65.5%) out of which upper limb injuries were 51.2%.^[9]

Various contributing factors for occupational injuries were analysed. The results shows that 51.8% of the population were professionally trained and the rest were untrained. The majority of the professionally trained were hospital professionals who had needle stick injuries. Only 0.9% of the workers had a pre-existing disease. Out of the 112 workers who were considered for study, 2 people were found to have consumed alcohol at work (1.8%). The number of workers who used personal protective equipment at work were 34.8%. About 7.1% of the injuries were associated with lack of proper sleep. According to study conducted by Bijay Mihir Kunar et al in 2003-2004 no formal education, regular consumption of alcohol, presence of disease, risk taking behaviour and big family size were associated with high risks of occupational injuries.^[11]

Outcome of the injuries were studied based on various parameters and we found that 18.8 % of the reported patients were admitted for further management. The rest of the patient were either treated or discharged from the emergency department or went against medical advice. This rate of admission is high compared to other studies across the world. The average final hospital expense following admission was 41861 rupees and it ranged from 8156- 1, 66,518 rupees. This has to be considered along with fact that most of the workers were getting a monthly income of less than 10000 rupees. This causes a huge financial burden on most of the workers.

Our study revealed that 35.8% of the patients required an imaging procedure (x-ray/CT scan). It also showed that 10.7% of them required operative procedures. About 9.8% of the workers injured had deformities present. The high rate of deformities

suggests that occupational injuries are leading cause of deformities among the working population. There was one death reported due to occupational injury. The death reported was due to electric shock at work. Needle stick injuries were analysed separately because the proportion of hospital professionals was more in the study population. Our study consisted of 41 needle stick injuries. The most common age group of injuries was 18-30 years (63.4%). Most of the needle stick injuries occurred in females (75.6%). The ratio of female to male population was 3:1. There was no significant relation between increasing working hours and needle stick injuries as 43.9 % of the injured had 7 hours shift whereas the other injured had more duration of work. Our study revealed that 61% of the injured were graduates followed by school educated (22%) and post graduates (17.1%). Injuries were equal in doctors and nurses, both accounting for 36.6 % followed by housekeeping staffs (17.1%) and paramedical personnel (9.8%). The study showed that most of the injuries took place in the afternoon hours (12pm-6 pm). It accounted for 39%. The average monthly income of the injured was 31656 rupees. Puncture wounds were the most common type of injuries (85.4%) followed by blood splash (14.6%). Most common affected body part was upper limb (85.4%) followed by eye (12.2%) and lower limb (2.4%).

Considering the contributing factors, 97.6% of them were professionally trained and 2.4% had a pre-existing illness. None of the hospital professionals who got injured had consumed alcohol at work. Our study revealed that 75.6% of the injured were using personal protective equipment. The personal protective equipment includes latex gloves, rubber gloves, goggles, aprons etc. A very small percentage (2.4%) of the study population had inadequate sleep on the previous night. All the needle stick injuries were treated in the emergency department and discharged.

CONCLUSION

Through this study we concluded that a fairly good number of occupational injuries comes to emergency department especially during to peak duty hours (12pm-6pm). Results also concluded that injuries were male predominant and affected the younger population who are breadwinners for their respective families. Sharp instrument and needle stick injuries contributed to majority of injuries and puncture wound was the most common type. The injuries affected mostly the upper limb. Patients and healthy young individuals should be educated regarding safety practices to avoid injuries in work. We also found that needle stick injuries were a major problem among health care professionals which needs to be looked into.

Limitations: Ours is a single centre study. Only cases reported to emergency department of Bangalore Baptist Hospital was considered

REFERENCES

1. Alves O, Gonçalves M, Brito P, Monteiro E, Jacinto C. Environmental impact and occupational risk in gasification plants processing residues of sewage sludge and refuse-derived fuel: a review. *International Journal of Occupational and Environmental Safety*. 2018 Oct 3;2(2):50-63.
2. Melamed S, Yekutieli D, Froom P, Kristal-Boneh E, Ribak J. Adverse work and environmental conditions predict occupational injuries: the Israeli cardiovascular occupational risk factors determination in Israel (cordis) study. *American journal of epidemiology*. 1999 Jul 1;150(1):18-26.
3. Sakurai K, Nakata A, Ikeda T, Otsuka Y, Kawahito J. How do employment types and job stressors relate to occupational injury? A cross-sectional investigation of employees in Japan. *Public Health*. 2013 Nov 1;127(11):1012-20.
4. World Health Organization. Global health risks: mortality and burden of disease attributable to selected major risks. *World Health Organization*; 2009 Oct 28.
5. Leigh J, Macaskill P, Kuosma E, Mandryk J. Global burden of disease and injury due to occupational factors. *Epidemiology*. 1999 Sep 1;10(5):626-31.
6. Eyayo F. Evaluation of occupational health hazards among oil industry workers: A case study of refinery workers. *IOSR J Environ Sci*. 2014 Dec;8(12):22-53.
7. Jackson LL. Non-fatal occupational injuries and illnesses treated in hospital emergency departments in the United States. *Injury prevention*. 2001 Sep 1;7(suppl 1):i21-6.
8. Celik K, Yilmaz F, Kavalci C, Ozlem M, Demir A, Durdu T, Sonmez BM, Yilmaz MS, Karakilic ME, Arslan ED, Yel C. Occupational injury patterns of Turkey. *World journal of emergency surgery*. 2013 Dec 28;8(1):57.
9. Sayhan MB, Sayhan ES, Yemenici S, Oguz S. Occupational injuries admitted to the emergency department. *JPMA. The Journal of the Pakistan Medical Association*. 2013 Feb 1;63(2):179-84.
10. Al-Dawood K. Non-fatal occupational injuries requiring admission to hospitals in Al-Khobar City, Saudi Arabia: prospective cohort study. *Croatian medical journal*. 2000 Sep 1;41(3):323-6.
11. Bhattacharjee A, Kunar BM, Baumann M, Chau N, Lorhandicap Group. The role of occupational activities and work environment in occupational injury and interplay of personal factors in various age groups among Indian and French coalminers. *International journal of occupational medicine and environmental health*. 2013 Dec;26(6):910-29.