

Socio Demographic Profile and Pattern of Injuries Due to Workplace Accidents in a Tertiary Care Hospital at Kancheepuram District

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Abstract

Workplace (occupational) injuries pose major public health and socioeconomic developmental issue leading to mental and physical disability. However, efforts towards investigation of determinants among factory workers are very minimal in developing countries. Thus, this study aimed at evaluation of the Socio demographic profile, identify determinants and pattern of occupational injury among victims of industrial accidents was undertaken. This retrospective study was conducted over a period of 2 years in a Tertiary care centre at Kancheepuram district. Total of 4693 work place accident cases visited the hospital (OP and IP) between January 2018 to December 2019. On statistical analysis, Male preponderance was noted and 3/4th of the study population belonged to age group of 20-40 years. Most of accidents 2815 (59.98%) took place in semi urban area and 1549 (33.01%) victims occurred in the Urban locality. 44.13% of the cases (2071) occurred in the summer season. 36% of the events were seen between 12 Noon to 6 PM. It was noted that abrasion was the commonest injury noted (69%, 3238) and the least common were burns injury (12%, 563). Upper limb injuries were noted in almost 3/4th of the cases (3426) and intracranial haemorrhages were observed in 55 cases. Only 1/3rd of the cases used protective gear during the incident. Lack of effective training, sleeping disturbance, and job stress increased the risk of occupational injury. Hence, providing health and safety education with importance given to the younger male workers, reducing stressors, and offering sleep health education were recommended.

Keywords: Occupational injuries, Workplace, Demographic profile, Safety, Construction workers.

Introduction

Occupational injury is any physical injury condition sustained on the worker in connection with the performance of his or her work. Employed people in industries spend at least one third of a day at work which have a strong effect on their health

and safety due to work and work-related injuries. The International Labour Organization (ILO) estimates that 860,000 people sustain injury or ill health at work daily, and nearly 1000 people die worldwide as a result of occupational injuries daily. Worldwide in 2005, an estimated of 250 million occupational injuries and 5.4 million deaths due to injuries occurred annually. From this, over 90 percent was in low- and middle income countries where the greatest concentration of world's workforce and low level of factories found. This problem costs the world a loss of roughly 4% of the gross national product. Despite this, only 5 to 10 percent of the workforce in developing countries has access to some kind of occupational health and safety services. In 2010 alone, over 313 million suffered non-fatal injuries at work globally leading to at least 4 days of absence from work. Unintentional industrial accidents across the

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globe accounts to 3.40 lakhs injuries every year. This is because of rapid urbanisation and industrialisation with labour oriented markets which depends on automation and mechanisation at workplace.^(1,2,3)

Industrial accidents are related to certain factors like lower support of the society, low job opportunity, violence among the co-workers in the industries, also depends on physical and mentally associated factors. The highest rate is associated with low socio economic people, male sex, overweight, and other factors that are controversial are age, smoking, drinking alcohol, marital history and number of children in the house.⁽⁴⁾

Industrial accidents are caused due to exhaustion of energy caused due to long hours of working shift, sleeplessness, lack of safety equipment. Over time working without any food cause hypoglycaemia which induce tiredness, giddiness, loss of concentration will lead injury during working hours. Every labours working in the industrial sector should be given proper training about the work and usage of personal protective gear for working to prevent the accident.^(5,6)

Appropriate evidence is required for injury prevention and control triumphantly although most studies have focused on general causes rather than association of different factors with occupational injury. Hence, our study surveyed the socio-demographic, work environment and behavioural factors associated along with the occupational injuries pattern in order to inform relevant injury prevention and control efforts.

Methodology

A retrospective study for a period of 2 years (January 2018 to December 2019) was conducted at Saveetha Medical College and Hospital where the data of 4693 cases of occupational injuries were collected from the medical records department. These cases presented to the emergency department and other Outpatient/ Inpatient departments of the hospital.

Necessary information for the study was gathered with the help of a detailed proforma for the purpose of recording history, epidemiological data, type of the industry involved and the details of injuries. The information thus collected, was Statistical analysed with SPSS software version 24.

Observation and Results

Sex: Among 4693 patients included in the study,

4177 were male (89%) and 516 were female (11%) victims. [Fig 1]

Age: Majority of the victims belonged to 20 to 30 years of age group accounting to 40% (1877) victims and 34.99% (1642) cases belonged to age group between 31 to 40 years. 17.02% (799) patients were from age group between 41 to 50 years and age group above 50 years amounted to 7.99% (375) patients only. [Fig 2].

Time of accident: Maximum cases were noted between midnight to 6 pm (1689, 36%) followed by that between midnight to 6 am (1314, 28%). 892 (19%) cases were noted between 6 pm to 12 midnight and from 6 am to 12 noon, 798 (17%) of them had injuries. [Table 1]

Place of injury: The site of study being in the semi urban zone, the maximum cases presented from semi urban, 59.98 % (2815) locality followed by those which occurred in Urban area, 33.01% (1549) and a very minimal case belonged to the village accounting to 7.01 % (329) cases. [Table 1].

Seasonal variation: In this retrospective study patients sustained injuries most commonly in summer season (2071, 44.13%) followed by winter season (1498, 31.92%) and rainy season (1124, 23.95%). [Table 1].

History of substance abuse: History of alcohol usage was found in 15.89%, 746 cases and Tobacco consumption in the form of bidis, cigarettes and Khaini was noted in 34.23%, 1606 cases. Combined usage was noted in 27.99 %, 1314 cases. History with regards to substance abuse was undetermined in majority of cases. [Table 1].

Socioeconomic status: According to Modified Kuppuswamy scale 2020, majority of the cases belonged to upper lower socioeconomic class (2019, 43.02%), followed closely by lower middle socioeconomic class (1025, 21.84%). The least numbers belonged to Upper socioeconomic status (239, 5.1%). [Table 1].

Type of the industries: The victims sustained injuries in their respective workplaces which are as follows: Automobile industry showed 36% (1689) cases, welding industry had 29% (1361) cases, Construction site and textile industry accidents accounted to 11% (516) and 8.99% (422) cases respectively. The other industries involved were electrical and chemical industry amounting to 7.99% (375) and 7.02% (330) of respective cases.

Parts of the body injured: Injury to the Upper limb was seen in 73% victims(3426), lower limb injuries were noted in 21% (986) patients. 4 % of the cases of head injury were noted in this study accounting to 188 cases. Intracranial haemorrhages were noted in 29% or 55 cases of the head injury cases (n=188). Injuries over the other body parts amounted to 9% (422) of cases. [Table 1]

Type of injury: In this retrospective study, the most common injury found was abrasion in 69% (3238)

patients, laceration was noted in 44.60 %(2093) cases, contusion was seen in 33.41% (1568) cases. Fracture caused by the accident accounted to 21% (986) of cases followed by cut injury accounting to 19% (892) injuries and injury due to burns was noted in 12% (563) patients. [Table 2].

Usage of protective gears: More than 2/3rd of the cases were not using protective gear (68%, 3191). [Fig 3].

Fig 1: Gender of the Victims Of Industrial Accidents

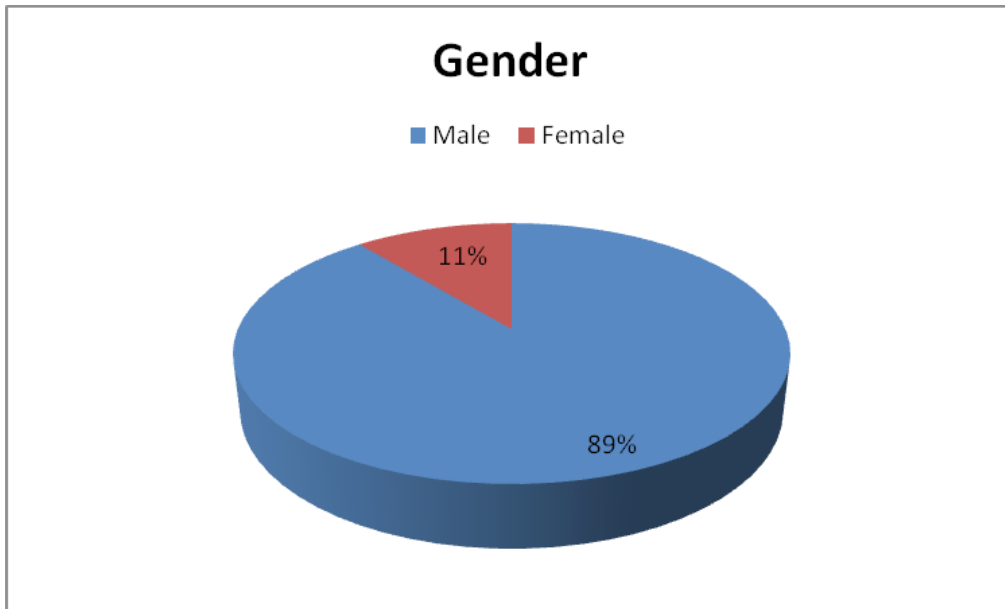


Fig 2: Age Groups of the Victims of Industrial Accidents

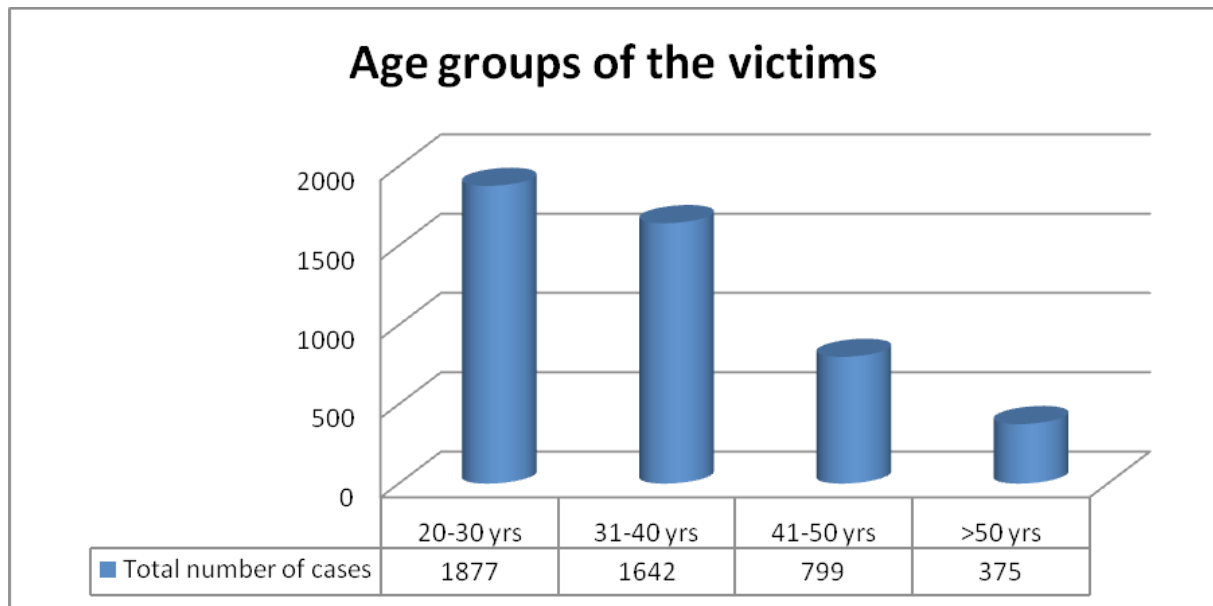
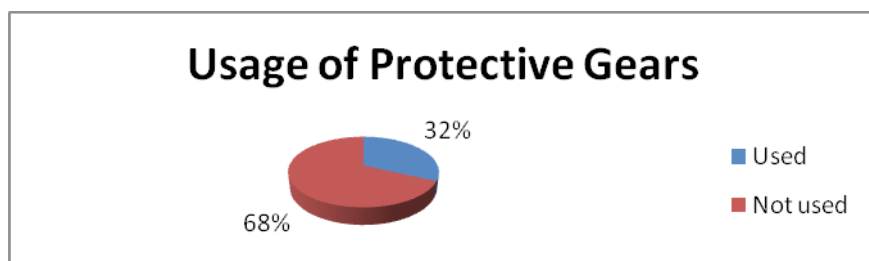


Fig 3: Usage of the Protective Gears/Devices.

**Table 1: Profile of Industrial Accident Injury Cases (N=4693)**

| Characteristics | No. of Cases | Percentage (%) | |
|--|--------------------------|----------------|--------|
| Time of Accident | 12:01AM-06:00AM | 1314 | 28% |
| | 06:01AM-12:00PM | 798 | 17% |
| | 12:01PM-06:00PM | 1689 | 36% |
| | 06:01PM-12:00AM | 892 | 19% |
| Season | Summer | 2071 | 44.13% |
| | Monsoon | 1124 | 23.95% |
| | Winter | 1498 | 31.92% |
| Place of Accident | Urban | 1549 | 33.01% |
| | Semiurban | 2815 | 59.98% |
| | Rural | 329 | 7.01% |
| Socio Economic Status (Modified Kuppaswamy Scale 2020) | Upper Class | 239 | 5.1% |
| | Upper Middle Class | 636 | 13.55% |
| | Lower Middle Class | 1025 | 21.84% |
| | Upper Lower Class | 2019 | 43.02% |
| | Lower Class | 774 | 16.49% |
| History of Substance Abuse | Alcohol | 746 | 15.89% |
| | Tobacco | 1606 | 34.23% |
| | Both Alcohol And Tobacco | 1314 | 27.99% |
| Parts of the Body Injured | Undetermined | 3379 | 72% |
| | Upper Limb | 3426 | 73% |
| | Lower Limb | 986 | 21% |
| | Head And Neck | 188 | 4% |
| | Thorax And Abdomen | 422 | 9% |

Table 2: Injury Pattern with Respect to Industrial Accidents

| Type of Injury | Total Numbers | Percentage |
|----------------|---------------|------------|
| Abrasion | 3238 | 69 |
| Contusion | 1568 | 33.41 |
| Laceration | 2093 | 44.60 |
| Fractures | 986 | 21 |
| Cut Injury | 892 | 19% |
| Burns | 563 | 12% |

Discussion

A total of 4693 industrial accident cases were observed in this retrospective study done at a tertiary care hospital in Kancheepuram district between 2018 to 2019. On analysis it is found that males were more vulnerable to industrial accidents than females. Males being the breadwinner in majority of family are exposed more frequently to outdoor work than females. Also male workers have high willingness and inclination to engage in risk-taking behavior and work than female

workers. This explains the male preponderance in the study similar to the observation made by few authors.⁽⁸⁾

On comparison with working age groups in these industries who attained injuries, it was found that 20 to 40 years of age group people had the higher incidence of injuries compared with other age groups. Most study findings at various places by many authors reported that working at younger age increases the risk of sustaining more occupational injury among factory workers compared with older workers as the younger age group people are more employed in the factories. They also have inaccessibility to health and safety information, lack of training on health and safety, less work experience, low level of knowledge and skill towards the work.^(9,10) However the values of this study contradicts with a study done among coal mining industrial workers which reported that older age group workers were at higher risk of occupational injury than young age group workers.⁽¹¹⁾

Maximum cases were noted between mid noon to 6 PM, more in the summer season. This can be due to exhaustion caused by extreme heat and probable hypoglycemia caused delayed reflexes. Almost 1/3rd of the cases had history of substance abuse at workplace leading to accidents.

Regarding the place of industrial accidents, majority were seen semi urban and urban areas. This could be explained as many industries have been established due to the globalisation where youngsters are employed for better productivity.

In this retrospective study, it is found that most type of industrial accidents are involving abrasion followed by laceration fractures cut injuries and burns. Majority of the victims sustained injuries on their hands, feet, legs or head/neck, shoulder, chest, eye, back or abdomen. This indicates that personal protective equipment targeting extremities and other safe working practices would make a change in industrial accidents. These findings are in accordance with other studies who reported injuries to the upper and lower limbs, upper trunk and extremities, i.e. eyes, neck, back, shoulder, arm, finger, and hand.^(12,13)

Conclusion

The findings from this study provide an insight into the injury experiences of workers in the Semiurban locality of Kancheepuram District. The analysis shines light on the vulnerabilities faced by workers of lower

socioeconomic strata who experience work-related injuries.

There was a relatively high prevalence of injuries over upper and lower extremities leading to loss of a considerable number of productive days. Low income, job stress, lack of Personal Protective Equipments provision and poor safety environment were significantly associated with occupational injuries. Multimodal approach integrating education for behavioural change, creating awareness amongst workers to demand for their rights to safety and protection at work, and legislation enforcement should be implemented in the best interests of all the workers in the industries.

Conflict of Interest: Nil

Ethical Clearance: Obtained

Source of Funding: Self

References

1. Aderaw Z, Engdaw D, Tadesse T. Determinants of occupational injury: a case control study among textile factory workers in Amhara Regional State, Ethiopia. *Journal of tropical medicine*. 2011 Oct;2011.
2. Kiconco A, Ruhinda N, Kyobutungi V, Watya S, Bazeyo W. Determinants of occupational injuries among building construction workers in Kampala City, Uganda. *Annals of Global Health*. 2017 Jan 1;83(1):86.
3. Kumar SG, Dharanipriya A. Prevalence and pattern of occupational injuries at workplace among welders in coastal south India. *Indian journal of occupational and environmental medicine*. 2014 Sep;18(3):135.
4. d'Errico A, Costa G. Socio-demographic and work-related risk factors for medium-and long-term sickness absence among Italian workers. *The European Journal of Public Health*. 2012 Oct 1;22(5):683-8.
5. Murty O, Chung B, Yin L, Loo T, Nurul IP. Pattern of injuries in fatal accidents of construction workers: A retrospective study of 10 years (1996-2005). *The Malaysian Journal of Forensic Pathology and Science*. 2006 Dec;44.
6. Tanga A, Tessema F, Jilo G. Prevalence of occupational injuries and associated factors among small-scale Industries Workers in Arba Minch

- Town, southern Ethiopia, 2016. *Int J Pub Health Safe*. 2018;3(152):2.
7. Chercos DH, Berhanu D. Work related injury among Saudi Star Agro Industry workers in Gambella region, Ethiopia; a cross-sectional study. *Journal of occupational medicine and toxicology*. 2017 Dec 1;12(1):7.
 7. Riley K, Morier D. Patterns of Work-Related Injury and Common Injury Experiences of Workers in the Low-Wage Labor Market. UCLA Labor Occupational Safety and Health Program, Los Angeles, CA. 2015 Mar.
 8. Bronson M, Howard E. Gender differences and their influence on thrill seeking and risk taking. Department of Psychology. 2003.
 9. Bhattacharjee A, Chau N, Sierra CO, Legras B, Benamghar L, Michaely JP, Ghosh AK, Guillemin F, Ravaud JF, Mur JM, Group L. Relationships of job and some individual characteristics to occupational injuries in employed people: A community-based study. *Journal of occupational health*. 2003 Nov; 45(6):382-91.
 10. Tadesse T, Kumie A. Prevalence and factors affecting work-related injury among workers engaged in Small and Medium-scale industries in Gondar wereda, North Gondor zone, Amhara Regional State, Ethiopia. *Ethiopian journal of health development*. 2007 Sep 13;21(1):25-34.
 11. Ghosh AK, Bhattacharjee A, Chau N. Relationships of working conditions and individual characteristics to occupational injuries: a case-control study in coal miners. *Journal of occupational health*. 2004;46(6):470-80.
 12. Abbas RA, Zalat MM, Ghareeb NS. Non-fatal occupational injuries and safety climate: a cross-sectional study of construction building Workers in Mit-Ghamr City, Dakahlia governorate, Egypt. *Open Journal of Safety Science and Technology*. 2013 Dec 13;2013.
 13. Dong XS, Fujimoto A, Ringen K, Stafford E, Platner JW, Gittleman JL, Wang X. Injury underreporting among small establishments in the construction industry. *American journal of industrial medicine*. 2011 May; 54(5):339-49.