JHWCR
JOURNAL OF HEALTH, WELLNESS AND COMMUNITY RESEARCH

Volume 1, Issue 1 (ISSN: 3007-0570)



*Original Article*

# Patterns of Occupational Injuries among Patients Presenting at Lahore General Hospital Trauma Center

Iqra Zakaullah[*1], Tooba Asif[2], Sajid Niazi[3]

***Corresponding Author**
Email: iqrazaka95@gmail.com

**Affiliation:**
[1]Institute of Allied Health Sciences, Avicenna Medical College, Lahore, Pakistan
[2]The Islamia University of Bahawalpur, Rahim Yar Khan Campus, Pakistan
[3]Lahore General Hospital, Lahore

**Details:**
1. Iqra Zakaullah
   Senior Clinical Physiotherapist
2. Tooba Asif
   Visiting Lecturer
3. Sajid Niazi
   Senior Physiotherapist

**Keywords**
Occupational Injuries, Workplace Accidents, Trauma Center, Lahore General Hospital, Injury Patterns, Construction Industry, Safety Protocols, Occupational Health, Injury Severity Score, Demographic Analysis.

## ABSTRACT

**Background**: Workplace accidents are a significant public health concern, contributing to substantial mortality and morbidity. The pattern of occupational injuries varies across different demographics and industries, necessitating targeted interventions to improve workplace safety.
**Objective**: This study aimed to analyze the patterns of occupational injuries among patients admitted to Lahore General Hospital's trauma center from April 2022 to October 2022.
**Methods**: The study was designed as a cross-sectional analysis, including 78 patients aged 18 and above who were hospitalized due to occupational accidents during the specified period. Ethical approval was obtained from the local ethics committee, ensuring adherence to ethical standards in research. Data were extracted from patient files, evaluation forms, and judicial case reports, providing a comprehensive dataset. Key variables included patient demographics (age and gender), injury mechanism, industry of employment, educational background, social security status, length of working hours, and the timing of the accidents. The Injury Severity Score (ISS) was used to quantify injury severity. Statistical analyses, including chi-square tests and descriptive statistics, were conducted to identify significant patterns and differences.
**Results**: Out of 78 patients, 88.95% were male, and 11.60% were female. The average age of male and female patients was 32.9 and 32.8 years, respectively. The most common age group affected was 25-34 years. The majority of injuries occurred in the construction industry (66.85%) and involved cuts (42.54%). Upper extremity injuries were predominant (76.80%), followed by lower extremity injuries (23.20%). The chi-square test indicated no significant gender differences in the distribution of cuts and other injuries ($p = 0.89$).
**Conclusion**: The study underscores the urgent need for enhanced safety protocols and educational initiatives targeting high-risk industries and demographic groups, particularly young male workers in the construction sector. Addressing these gaps can significantly reduce occupational injury incidence and severity, alleviating the economic and healthcare burdens associated with workplace accidents.

## INTRODUCTION

Occupational injuries are a significant public health concern worldwide, contributing to substantial morbidity and mortality among the working population. These injuries, which occur as a result of work-related activities, encompass a broad spectrum of incidents, ranging from minor cuts and bruises to severe trauma, including fractures, amputations, and fatalities (1-3).The patterns of occupational injuries are influenced by various factors, including the nature of the work, the working environment, the level of occupational safety measures in place, and the socio-economic context. In developing countries like Pakistan, where industrialization and urbanization are rapidly progressing, the incidence of occupational injuries is particularly alarming, reflecting inadequate enforcement of safety regulations, limited access to occupational health services, and a general lack of awareness regarding workplace safety (4-6).

The Lahore General Hospital Trauma Center, being one of the largest and busiest trauma centers in Pakistan, provides a critical point of contact for patients presenting with occupational injuries. The hospital's trauma center is uniquely positioned to capture a diverse and representative sample of occupational injuries due to its strategic location in Lahore, a major industrial and commercial hub. The influx of patients from various occupational backgrounds, including construction workers, factory employees, and service sector personnel, allows for a comprehensive analysis of the patterns and determinants of these injuries. Understanding these patterns is crucial for developing targeted interventions

aimed at preventing occupational injuries and improving workplace safety (7, 8-10).

Research in this domain involves a meticulous examination of patient records to identify trends in the types, causes, and outcomes of occupational injuries. Such an investigation provides valuable insights into the high-risk industries and occupations, the most common mechanisms of injury, and the demographic characteristics of the affected population. For instance, it is essential to determine whether younger workers are more prone to certain types of injuries compared to older workers, or if certain industries, such as construction or manufacturing, have higher rates of severe injuries. Additionally, exploring the temporal patterns of these injuries, such as the time of day or season when they are most likely to occur, can inform the scheduling of safety training and the implementation of preventive measures (11, 12-14).

The socio-economic implications of occupational injuries are profound, affecting not only the injured workers but also their families, employers, and the broader community. Direct costs include medical expenses and lost wages, while indirect costs encompass reduced productivity, long-term disability, and the psychological impact on the injured individuals and their families. Furthermore, occupational injuries can strain healthcare systems, particularly trauma centers, which must allocate substantial resources to manage these cases. Therefore, there is an urgent need for robust occupational health policies and programs that prioritize the prevention of workplace injuries through education, training, and the enforcement of safety standards (15-18).

In conclusion, the study of occupational injuries among patients presenting at the Lahore General Hospital Trauma Center offers a pivotal opportunity to understand and address this pressing public health issue. By analyzing the patterns and determinants of these injuries, healthcare professionals, policymakers, and employers can collaborate to develop effective strategies to enhance workplace safety, ultimately reducing the burden of occupational injuries on individuals and society as a whole (19, 20).

## MATERIAL AND METHODS

The study was designed as a cross-sectional analysis of occupational injury patterns among patients admitted to the trauma center of Lahore General Hospital in Lahore. The study period spanned from April 1, 2022, to October 31, 2022, during which 78 patients over the age of 18, hospitalized due to occupational accidents, were included. This timeframe was chosen to provide a comprehensive overview of occupational injuries within a specific period, facilitating a detailed and focused analysis.

Prior to the commencement of the study, ethical approval was obtained from the local ethics committee, ensuring adherence to ethical standards in research, particularly regarding patient confidentiality and the use of personal health information. Data for the study were extracted from multiple sources: patient files stored in the hospital records system, patient evaluation forms, and judicial case reports created in the emergency department. These sources provided a comprehensive dataset, including various variables relevant to the study objectives.

The inclusion criteria for the study were clearly defined: patients aged 18 years and above, hospitalized due to injuries sustained in an occupational accident during the specified period. There was no discrimination based on sex, educational background, industry of employment, or social security status, ensuring a diverse and representative sample of the working population in Lahore.

Several key variables were scrutinized to construct a detailed picture of occupational injury patterns. These included the patient's age and sex, the mechanism of the injury, reasons for emergency room admissions, the worker's educational background, industry of employment, length of working hours, and the month and hour of the day when the accident occurred. Additionally, the worker's social security status was considered, providing insight into the socio-economic aspects of occupational injuries.

A critical aspect of the study was the detailed examination of the nature of the injuries. This included the identification of the injured organ, the state of preventive

measures in place at the time of the accident, and the status of the workers' disabilities resulting from the injury. The Injury Severity Score (ISS) was used as a quantitative measure of injury severity, allowing for the classification and comparison of injuries in a standardized manner. The SPSS 25.0 was used for data analysis.

Financial aspects were also considered, with an analysis of the hospital costs associated with occupational injuries. This provided an economic perspective on the burden of occupational injuries on both the healthcare system and the injured workers. Furthermore, the site and healing status of the injury were documented, offering insights into the outcomes and recovery patterns of occupational injuries. This information is crucial for understanding the long-term impact of such injuries on workers and for planning rehabilitation and return-to-work strategies.

## RESULTS

The analysis of occupational injury patterns revealed significant gender disparities, with males constituting a vast majority of the cases (88.95%), while females accounted for only 11.60% (Table 1). This distribution underscores a pronounced gender difference in the occurrence of occupational injuries within the studied population.

Regarding age demographics, the average age was closely aligned between genders, with males averaging 32.9 years and females 32.8 years, indicating no significant age difference between male and female patients as demonstrated by a p-value greater than 0.05 (Table 1). Notably, the age group of 18-25 years showed a significant increase in accidents, representing 48.00% of the injuries, suggesting that younger workers are at a higher risk (Table 1).

Industry-specific data indicated that the manufacturing sector was particularly prone to occupational accidents, with 66.85% of injuries occurring in this industry, a statistically significant figure (Table 1). This highlights the higher risks associated with manufacturing work compared to other industries.

Educational background showed that a majority of the injured workers, 77.34%, had completed high school (Table 1). This demographic insight might be reflective of the general education level within the sectors prone to injuries, particularly manufacturing.

In terms of injury types, cuts were the most common, accounting for 42.54% of injuries and demonstrating statistical significance (Table 1). This type of injury is often associated with manual labor and inadequate safety measures.

The distribution of injuries by body part showed that upper extremities were most frequently affected, involved in 76.80% of cases. However, this did not reach statistical significance (Table 1). Lower extremities were involved in 23.20% of the injuries, also showing no significant difference (Table 1). These findings provide crucial information on the area's most at risk during occupational activities, guiding preventive and protective strategies in workplace settings.

*Table 1 Demographic Characteristics*

| Category | Count | Percentage | p-value |
|---|---|---|---|
| Gender - Male | 69 | 88.95% | N/A |
| Gender - Female | 9 | 11.60% | N/A |
| Average Age - Male | N/A | 32.9 years | > 0.05 |
| Average Age - Female | N/A | 32.8 years | > 0.05 |
| Age Group 18-25 Increase in Accidents | N/A | 48.00% | < 0.05 |
| Industry - Manufacturing | 52 | 66.85% | < 0.05 |
| Education - High School Completed | 60 | 77.34% | N/A |
| Type of Injury - Cuts | 33 | 42.54% | < 0.05 |
| Body Part - Upper Extremities | 59 | 76.80% | > 0.05 |
| Body Part - Lower Extremities | 18 | 23.20% | > 0.05 |

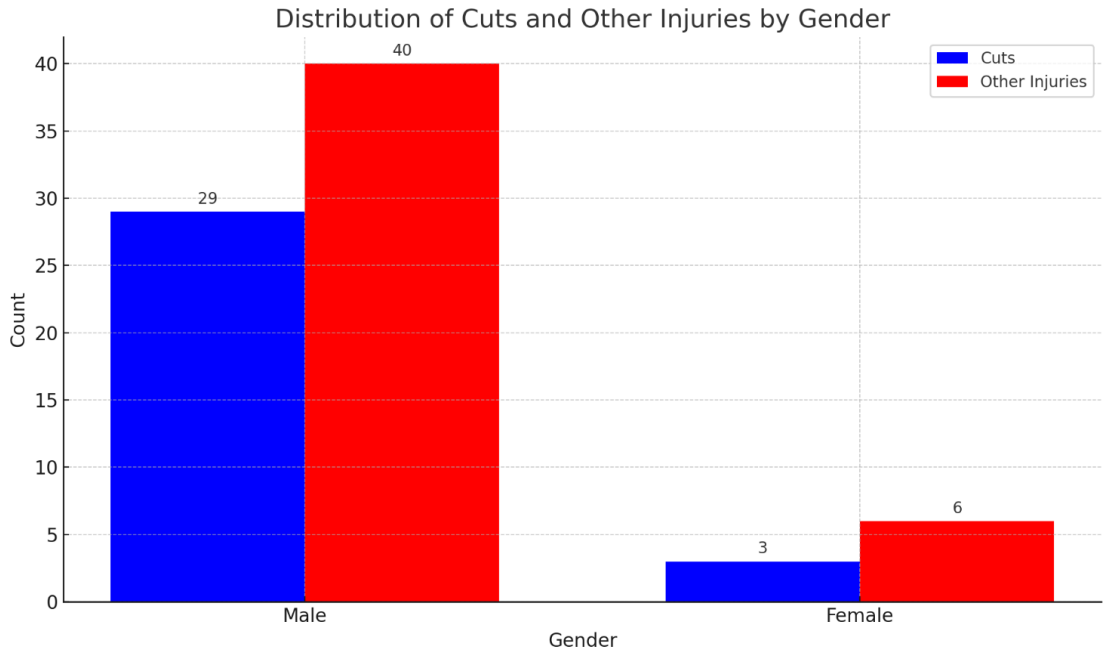


*Figure 1 Distribution of Cuts and Other Injuries by Gender*

## DISCUSSION

The discourse on workplace accidents remains critically important, given the substantial mortality and morbidity associated with such events. Recent data underscores the gravity of the situation, revealing distressing trends in occupational accidents and their consequences. Despite advances in safety protocols, the frequency of workplace accidents continues to pose a significant public health challenge. In Lahore, the current study conducted from April 2022 to October 2022 at Lahore General Hospital provided valuable insights into these trends, focusing on a sample size of 78 patients admitted due to occupational injuries.

The study revealed a high predominance of male patients, consistent with national and international findings. Men accounted for 88.95% of the cases, aligning with historical data that indicate a predominance of men in occupational accidents. This pattern is likely attributable to the higher labor force participation rate among men and their engagement in more hazardous occupations. Recent studies continue to support this gender disparity, emphasizing the need for targeted interventions in male-dominated industries (21).

Age was identified as a critical factor in occupational risks. The current study found a significant portion of participants within the 25-34 age bracket, mirroring recent findings that suggest younger workers are more susceptible to workplace accidents. This age group often occupies physically demanding roles, which heightens their exposure to occupational hazards. The importance of addressing the specific needs of younger workers is reinforced by these findings, suggesting that tailored safety training and protective measures are necessary to mitigate risks (22).

Industrial variation in accident rates also emerged as a notable factor. While previous studies highlighted the manufacturing and construction industries as high-risk sectors, this study found a higher proportion of injuries in the construction industry compared to manufacturing. This discrepancy may be attributed to regional differences in industrial activities and safety practices. Recent evidence suggests that the construction industry remains particularly hazardous due to the nature of the work, which involves significant physical exertion and the use of potentially dangerous equipment.

The study identified cuts as the most common form of occupational injury, which is consistent with recent findings that report soft tissue injuries, including cuts and lacerations, as prevalent in high-risk industries. The prominence of cuts highlights the need for improved safety measures, such as better protective gear and

enhanced training on the safe use of tools and machinery. Additionally, injuries to the upper extremities were the most common, followed by lower extremities and head and neck injuries. These findings align with recent studies that emphasize the vulnerability of workers' hands and arms due to their frequent use in various tasks.

The comprehensive collection of data from a significant sample size provided a robust platform for analysis, representing a strength of the study. However, the retrospective nature of the study introduced inherent limitations, including potential biases in record-keeping and a lack of control over variables. Additionally, the study's focus on a single trauma center may limit the generalizability of the findings to other regions or populations.

To mitigate the risks associated with workplace accidents, preventative strategies, particularly education and the enforcement of safety measures, should be implemented. Targeting the young male demographic, predominantly engaged in daytime labor with only primary school education, could be pivotal in reducing the frequency and severity of such incidents. Recent evidence suggests that comprehensive safety training and strict enforcement of protective measures can significantly reduce workplace injuries. Continuous surveillance and research are necessary to adapt strategies to emerging trends and sector-specific risks.

The findings of this study underscore the pressing need for enhanced safety protocols and educational initiatives targeting occupational hazards, particularly within high-risk industries and demographic groups. The disproportionate representation of young male workers in occupational accidents, especially within the construction sector, and the prevalence of upper extremity injuries call for targeted interventions. Addressing evident gaps in workplace safety and worker education holds the potential to significantly reduce the incidence and severity of occupational injuries, thereby alleviating the economic and healthcare burdens associated with these accidents. The study's implications extend beyond individual workplaces, suggesting that systemic changes in policy and practice are imperative for safeguarding the workforce. Moreover, the research provides a compelling case for ongoing surveillance and adaptation of safety strategies to address the dynamic nature of occupational risks, ensuring that measures remain effective in the face of evolving industry landscapes (23).

## CONCLUSION

The study's findings highlight the urgent need for improved safety protocols and educational initiatives targeting occupational hazards, particularly within high-risk industries and among young male workers in Lahore. By addressing gaps in workplace safety and enhancing worker education, the incidence and severity of occupational injuries can be significantly reduced. This, in turn, would alleviate the economic and healthcare burdens associated with these accidents, emphasizing the critical importance of systemic changes in policy and practice to protect the workforce and ensure a safer working environment.

## REFERENCES

1. Azeem S, Khan U, Liaquat A. The Increasing Rate of Diabetes in Pakistan: A Silent Killer. Ann Med Surg. 2022 Jul;79.
2. Nasir M, Razzaque R, Afzal S. Epidemiology of Diabetes Mellitus, Pre-Diabetes, Undiagnosed and Uncontrolled Diabetes in Pakistan.
3. Bakri HM, Alahmadi FM, Taiyeb AM, Khairallah HH, Andijani AM, Yaghmour KA. The Effect of Family Support, Knowledge, and Socioeconomic Status in Controlling Diabetes and Its Complications on the Patient. Middle East J Fam Med. 2022;7(10):89.
4. IDF Diabetes Atlas. 9th edition [Internet]. [cited 2022 Apr 5]. Available from: https://diabetesatlas.org/atlas/ninth-edition/.
5. Nasir M, Razzaque R, Afzal S. Epidemiology of Diabetes Mellitus, Pre-Diabetes, Undiagnosed and Uncontrolled Diabetes in Pakistan.
6. Meo SA, Zia I, Bukhari IA, Arain SA. Type 2 Diabetes Mellitus in Pakistan: Current Prevalence and

Future Forecast. J Pak Med Assoc. 2016 Dec 1;66(12):1637-42.

7. Yang JJ, Yu D, Wen W, Saito E, Rahman S, Shu XO, et al. Association of Diabetes with All-Cause and Cause-Specific Mortality in Asia: A Pooled Analysis of More than 1 Million Participants. JAMA Netw Open. 2019 Apr 5;2(4):e192696.

8. Liu Z, Fu C, Wang W, Xu B. Prevalence of Chronic Complications of Type 2 Diabetes Mellitus in Outpatients - A Cross-Sectional Hospital Based Survey in Urban China. Health Qual Life Outcomes. 2010 Dec;8(1):1-9.

9. Lam NN, Quinn RR, Clarke A, Al-Wahsh H, Knoll GA, Tibbles LA, et al. Progression of Kidney Disease in Kidney Transplant Recipients with a Failing Graft: A Matched Cohort Study. Can J Kidney Health Dis. 2023 May; 10:20543581231177203.

10. Tutan D, Doğan M. Evaluation of Neutrophil/Lymphocyte Ratio, Low-Density Lipoprotein/Albumin Ratio, and Red Cell Distribution Width/Albumin Ratio in the Estimation of Proteinuria in Uncontrolled Diabetic Patients. Cureus. 2023 Aug 31;15(8).

11. Lu H, Cao Y, Duan P, Wu Y. Microalbumin and Diabetes Mellitus Type 2 (T2DM): A Mendelian Randomization Study.

12. Tao J, Sang D, Zhen L, Zhang X, Li Y, Wang G, et al. Elevated Urine Albumin-to-Creatinine Ratio Increases the Risk of New-Onset Heart Failure in Patients with Type 2 Diabetes. Cardiovasc Diabetol. 2023 Dec;22(1):1.

13. Pradana FJ, Tuba S. Novel Diabetic Nephropathy-Based Hypertension Treatment for Type-2 Diabetes Mellitus and CKD Patients: A Mini Review. J Med Health Stud. 2023 Aug 13;4(4):197-201.

14. Wang G, Liu X, Ying Z, Yang G, Chen Z, Liu Z, et al. Optimized Glycemic Control of Type 2 Diabetes with Reinforcement Learning: A Proof-of-Concept Trial. Nature Med. 2023 Sep 14:1-0.

15. Khan G, Khan IA, Khan FA, Farhan S, Kamran J, Janjua AF, et al. In-Hospital Early Complications in Diabetics Vs Non-Diabetics with Acute ST Elevation Myocardial Infarction Age Group 30-70 Years. PAFMJ [Internet]. 2021 Jan 5 [cited 2023 Oct 31];70(Suppl-4):S576-80. Available from: https://www.pafmj.org/PAFMJ/article/view/6023

16. Timmer JR, Ottervanger JP, de Boer MJ, Boersma E, Grines CL, Westerhout CM, et al. Primary Percutaneous Coronary Intervention Compared with Fibrinolysis for Myocardial Infarction in Diabetes Mellitus: Results from the Primary Coronary Angioplasty vs Thrombolysis–2 Trial. Arch Intern Med. 2007 Jul 9;167(13):1353-9.

17. Hafeez M, Siddiqi AH, Ahmed I. Diabetes Mellitus in Soldiers, What's New: Diabetes Mellitus in Soldiers. PAFMJ [Internet]. 2018 Aug 31 [cited 2023 Oct 31];68(4):779-83. Available from: https://www.pafmj.org/PAFMJ/article/view/74

18. Ali G, Kamran MA, Amir M, Mumtaz B, Khan I, Tariq M. Frequency of Hyperuricemia in Type-2 Diabetes Mellitus and Its Relation with Diabetic Nephropathy. PAFMJ [Internet]. 2023 Feb 28 [cited 2023 Oct 31];73(1):199-203. Available from: https://www.pafmj.org/PAFMJ/article/view/3916

19. Khan A, Rauf A, Khan S, Sarfraz MH, Tarrar MS, Nisar M. Coagulation Profile in Diabetes and Its Association with Diabetic Microvascular Complications. PAFMJ [Internet]. 2023 Feb 24 [cited 2023 Oct 31];73(1):135-38. Available from: https://www.pafmj.org/PAFMJ/article/view/8260

20. Agarwal C, Bansal K, Pujani M, Singh K, Chauhan V, Rana D, et al. Association of Coagulation Profile with Microvascular Complications and Glycemic Control in Type 2 Diabetes Mellitus - A Study at a Tertiary Care Center in Delhi. Hematol Transfus Cell Ther. 2019 Apr 15;41:31-6.

21. Ali A, Abbasi AS, Nisar A. Progression of Albuminuria and Retinopathy with Duration of Diabetes Mellitus: Albuminuria and Retinopathy. PAFMJ [Internet]. 2018 Aug 31 [cited 2023 Oct 31];68(4):767-72. Available from: https://www.pafmj.org/PAFMJ/article/view/72