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Facial Trauma in Southwestern Nigeria: Epidemiology, Patterns, and Outcomes - A Comprehensive Analysis from Ekiti State

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Abstract

This study examined the demographic characteristics, aetiology, clinical features, complications, and management outcomes of facial injuries among patients presenting to a tertiary healthcare facility in Ekiti State, Nigeria. A prospective study was conducted over six months involving patients with facial injuries. Data were collected from all age groups presenting with facial injuries at the Ear, Nose, and Throat (ENT) Department. Descriptive and inferential statistical analyses were performed to identify associations between variables, with statistical significance determined at $p < 0.05$. A male predominance (85.2%) was observed, with the majority aged 21-30 years (37.7%). Road traffic crashes (47.5%) were the leading cause of injuries, followed by assaults (21.3%) and domestic accidents (14.8%). Most patients presented with facial soft tissue injuries (93.4%), with common clinical features including facial pain (95.1%) and nasal blockage (62.3%). Complications occurred in a notable proportion of patients, with wound infections reported in 9.8% of cases. Significant associations were observed between age groups and aetiology (p -values: 0.001-0.034), and between education levels and injury types ($p < 0.05$). Management strategies primarily comprised conservative treatment (36.1%) and soft tissue repairs (31.1%). The findings demonstrate the predominant occurrence of facial injuries in younger males, primarily attributable to road traffic accidents. These data underscore the urgent need for targeted preventive strategies and improved management protocols, emphasizing the importance of multidisciplinary approaches in addressing facial trauma complexity. The results provide critical insights for policymakers and healthcare professionals aiming to enhance trauma care and prevent facial injuries within this demographic.

Keywords

Facial injury, Trauma, Road traffic accident, Complications, Management, Nigeria

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1. Introduction

Facial injuries constitute a significant proportion of trauma presentations in emergency medical settings. They can lead to both functional deficits and cosmetic deformities, profoundly impacting the quality of life of affected individuals [1]. Globally, facial injuries arise from various aetiologies, including road traffic accidents, physical assaults, sports injuries, and occupational hazards [2]. The high incidence of facial injuries in urban settings has been attributed to increased vehicular traffic, elevated crime rates, and more active lifestyles among younger populations [3].

In Nigeria, particularly in Ekiti State, the aetiology of facial injuries is multifactorial. Road traffic crashes are frequently cited as the leading cause, with a notable correlation to urbanization and poor adherence to road safety measures [4]. Furthermore, domestic injuries and assaults represent significant contributors, highlighting the need for targeted public health and safety interventions [5]. The pattern of injuries may vary markedly based on sociodemographic factors such as age and sex [6].

Clinically, facial injuries can present as soft tissue injuries, fractures, or both [7]. Damage to facial structures can result in pain, swelling, and functional impairment of essential functions such as speech and swallowing [8]. Soft tissue injuries are prevalent, accounting for a significant percentage of cases admitted for facial injuries, with facial bone fractures noted in a smaller proportion of cases [9].

Management approaches range from conservative measures and minor surgical interventions to major reconstructive surgeries, depending on injury complexity and severity [10]. Despite various intervention strategies, complications such as infections and facial deformities may arise, impacting recovery and patient satisfaction [11].

Sociodemographic factors, including age, education, occupation, and social habits, have been shown to influence both the incidence and outcomes of facial injuries [12]. Younger patients are often at heightened risk due to behavioral factors and engagement in risk-prone activities [13]. Moreover, educational levels may correlate with patients' understanding of safety protocols and injury management, potentially affecting recovery rates and complication prevalence [14].

This study aimed to: (1) assess the demographic characteristics of patients presenting with facial injuries in Ekiti, Nigeria; (2) evaluate the aetiology of such injuries within this population; (3) identify the types and clinical features of facial injuries experienced; (4) examine management strategies implemented and their associated outcomes; and (5) explore the relationship between sociodemographic factors and clinical outcomes. This comprehensive approach aims to enhance understanding of facial injuries and their implications in the region.

2. Materials and Methods

This prospective study evaluated the epidemiology, clinical characteristics, and management of facial injuries in patients attending a tertiary healthcare facility in Ekiti State, Nigeria. The study was approved by the Ethics and Research Committee of Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria (Protocol No. EKSUTH/A67/2026/01/006), and informed consent was obtained from all participants prior to enrollment. The study was conducted in accordance with the Declaration of Helsinki (June 1964) and subsequent amendments.

Data collection occurred over six months, from July to December 2024. The study population included all consecutive patients of all ages presenting to the ear, nose and throat (ENT) Department and Emergency Department with facial injuries referred for otorhinolaryngology, head and neck review, and management. Patients were recruited consecutively as they presented. A total of 61 patients were included in the final analysis.

Inclusion Criteria included adults and children aged one year and above. Patients presenting with facial injuries diagnosed with any type of facial injury, including soft tissue injuries and fractures. Patients who consented to participate (or whose guardians consented for minors). Patients presenting for treatment within 30 days post-injury. Patients referred from other departments (e.g., Emergency, Orthopedic Surgery) for facial injuries.

Exclusion Criteria included patients below one year of age. Patients unwilling or unable to provide informed consent. Patients with significant systemic illness compromising management of facial injuries (e.g., severe neurological conditions, intoxication influencing clinical presentation). Patients with pre-existing facial deformities or injuries that could confound study results. Patients admitted under emergency protocols for life-threatening conditions unrelated to facial injury, where treatment focus precluded comprehensive facial trauma assessment.

Data were collected using a structured questionnaire containing sections on sociodemographic characteristics, mechanism of injury, clinical features, and management. Variables recorded included:

Sociodemographic variables: Age, sex, place of residence (urban/rural), religion, education level, occupation, and social habits (alcohol consumption and drug use).

Clinical variables: Aetiology of injury, types of injuries, associated systemic injuries, clinical features (e.g., facial pain, nasal blockage), and complications.

Management approaches: Type of treatment administered, including conservative measures, surgical interventions, and referral sources (e.g., casualty officers, self-referrals).

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 28.0. Data were summarized using descriptive statistics, including frequency counts and percentages for categorical variables. Continuous variables were reported as mean and standard deviation (SD) or median and interquartile range (IQR), as appropriate.

Descriptive analysis: Frequencies and percentages were computed for sociodemographic characteristics (sex, age group, education, occupation), aetiology, and types of facial injuries.

Inferential analysis: The Chi-square test was used to assess relationships between categorical variables, such as age group and aetiology of facial injury. A p-value of less than 0.05 was considered statistically significant. Fisher's Exact Test was utilized when the expected frequency in any cell was less than five, particularly relevant in scenarios with limited observations, such as injury types and education levels.

Logistic regression analysis was conducted to identify factors associated with complications post-injury management. Variables found to be significant were included in multivariate models to control for potential confounders.

On ethical considerations, this study was conducted in accordance with the Declaration of Helsinki (June 1964) and local regulations. Ethical approval was obtained from the institutional review board, ensuring patients' privacy and confidentiality were maintained throughout the study process. Written informed consent was obtained from all adult participants. For minor participants (below 18 years), written informed consent was obtained from parents or legal guardians, with assent obtained from minors where appropriate. Participants were assured of the confidentiality of their information and their right to withdraw from the study at any time without consequences to their medical care. All data were anonymized prior to analysis.

3. Results

3.1 Sociodemographic Characteristics

Majority of patients (37.7%) were within the 21-30 years age group, with a notable decrease in patients older than 50 years. Males accounted for 85.2% of patients, and 67.2% resided in urban areas. Most patients had at least a secondary education level. Social habits among patients included alcohol consumption (37.7%) and drug indulgence (14.8%). These distributions are demonstrated in Table 1.

Table 1. Sociodemographic characteristics of patients.

Feature	Frequency (%)
Age Group (years)	
1-10	3(4.9)
11-20	17(27.9)
21-30	23(37.7)
31-40	11(18.0)
41-50	4(6.6)
51-60	2(3.3)
≥61	1(1.6)
Sex	
Male	52(85.2)
Female	9(14.8)
Dwelling	
Urban	41(67.2)
Rural	20(32.8)
Religion	
Christian	56(91.8)
Muslim	5(8.2)
Education Level	
Nil formal	9(14.8)
Primary	11(18.0)
Secondary	23(37.7)
Post-secondary	18(29.5)
Occupation	
Students/apprentice	15(24.6)
Business	13(21.3)
Artisan	18(29.5)
Civil servant	12(19.7)
Farming	3(4.9)
Social Habit	
None	30 (49.2)
Alcohol consumption	23(37.7)
Drug indulgence	9(14.8)
Total	61 (100.0)

3.2 Clinical Profile

Road traffic crashes were the leading cause of facial injury, accounting for 47.5% of cases. Assaults (21.3%) and domestic injuries (14.8%) were also significant aetiologies. Soft tissue injuries were sustained by 93.4% of patients, while facial bone fractures occurred in 18.0%. The majority of patients (45.9%) had no associated systemic injuries. Among those with systemic involvement, orthopaedic injuries (26.2%) and ophthalmic injuries (14.8%) were most frequent. Facial pain was the most common clinical feature, reported in 95.1% of patients. Other frequent findings included facial and nasal swelling/deformities (77.0%), body ache (60.7%), nasal blockage (62.3%), and epistaxis (52.5%). Complications were absent in 49.2% of patients. The most common complications were wound infection (9.8%) and trismus (9.8%). Mortality occurred in 4.9% of cases. Conservative management was employed in 36.1% of patients, while soft tissue repairs were performed in 31.1%. Other interventions included nasal packing (21.3%), closed reduction and immobilization (4.9%), and open reduction with internal fixation (1.6%). These features are shown in Table 2.

Table 2. Clinical profile of facial injuries.

Variable	Frequency (%)
Aetiology	
Road traffic crash	29(47.5)
Sport	2(3.3)
Domestic injury	9(14.8)
Industrial	3(4.9)
Assault	13(21.3)
Burns	4(6.6)
Gunshot	1(1.6)
Type of Injury	
Facial soft tissue injuries	57(93.4)
Facial bone fracture	11(18.0)
Both soft tissue and bone fracture	6(9.8)
Systemic Injury	
None	28(45.9)
Neurosurgical	5(8.2)
Orthopaedic	16(26.2)
Cardiothoracic surgery	1(1.6)
Abdominal injuries	2(3.3)
Ophthalmic injuries	9(14.8)
Clinical Feature	
Facial pain	58(95.1)
Epistaxis	32(52.5)
Nasal blockage	38(62.3)
Difficulty breathing	17(27.9)
Cerebrospinal fluid (CSF) rhinorrhea	4(6.6)
Facial and nasal swelling/deformities	47(77.0)
Facial wound	16(26.2)
Loss of consciousness	5(8.2)
Body ache (chest/abdomen/limbs)	37(60.7)
Complications	
None	30(49.2)
Wound infection	6(9.8)
Wound dehiscence	1(1.6)
Hypertrophic scar	3(4.9)
Facial paresis	2(3.3)
Trismus	6(9.8)
Death	3(4.9)
Management	
Conservative	22(36.1)
Nasal packing	13(21.3)
Soft tissue repairs	19(31.1)
Close reduction and immobilization	3(4.9)
Open reduction and internal fixation	1(1.6)
Endotracheal/tracheostomy tube	3(4.9)
Total	61 (100.0)

3.3 Age Group Differences in the Aetiology of Facial Injury

Analysis of the relationship between age group and aetiology of facial injury revealed significant associations. Road traffic crashes were most frequent among patients aged 21-30 years (62.5%) and 51-60 years (100.0%). Domestic injuries were prevalent in the 1-10 years (66.7%) and 31-40 years (36.4%) age groups. These associations are elaborated in Table 3.

Table 3. Association between age group and aetiology of facial injury.

Age Group (years)	Road Traffic Crash (%)	Assault (%)	Domestic Injury (%)	p-value
1-10	33.3	0	66.7	0.034
11-20	47.1	23.5	11.8	0.021
21-30	62.5	20.8	8.3	0.001
31-40	36.4	9.1	36.4	0.312
41-50	50.0	25.0	25.0	0.763
51-60	100.0	0	0	0.125
≥61	0	0	100.0	0.001

3.4 Education Level Differences in the Types of Facial Injuries

A significant association was observed between education level and type of facial injury. Soft tissue injuries increased with higher education levels, from 66.7% in those with no formal education to 100.0% in those with post-secondary education. Bone fractures were most frequent among patients with no formal education (33.3%). These findings are illustrated in Table 4.

Table 4. Relationship between education level and types of facial injuries.

Education Level	Soft Tissue Injuries (%)	Bone Fractures (%)	Both (%)	p-value
Nil formal	66.7	33.3	0	0.045
Primary	72.7	9.1	18.2	0.31
Secondary	95.7	17.4	8.7	0.001
Post secondary	100.0	22.2	0	0.056

3.5 Association between Systemic Injuries and Complication Rates

A statistically significant association was found between the presence of systemic injuries and complication rates. Patients with ophthalmic injuries had a complication rate of 22.2%, while those with neurological injuries had a rate of 60.0%. Patients without systemic injuries had a complication rate of 33.3%. These associations are demonstrated in Table 5.

Table 5. Systemic injuries versus complications from facial injuries.

Systemic Injuries	Complications (%)	p-value
None	66.7	0.004
Neurological	33.3	0.032
Orthopaedic	38.3	0.061
Cardiothoracic	0	-
Abdominal	50.0	0.25
Ophthalmic	77.8	0.037

3.6 Association between Source of Referral and Type of Management

The source of referral was significantly associated with the type of management received. Patients referred by oral and maxillofacial surgeons underwent surgical management in 75.0% of cases, compared to 21.9% of those referred by casualty officers. These findings are shown in Table 6.

Table 6. Association between source of referral and type of management.

Source of Referral	Conservative (%)	Surgical (%)	p-value
Casualty Officer	78.1	21.9	0.005
Self-reported	53.3	46.7	0.015
Oral and Maxillofacial Surgeon	25.0	75.0	0.001
Orthopedic Surgeon	66.7	33.3	0.085

3.7 Clinical Characteristics and Complications

Significant associations were identified between specific clinical features and the occurrence of complications. Complications occurred in all patients with CSF rhinorrhea (100.0%), 80.0% of patients with facial pain, 70.6% of patients with difficulty breathing, and 63.8% of patients with swelling/deformities. These associations are illustrated in Table 7.

Table 7. Clinical features and associated complications.

Clinical Feature	Complications Present (%)	Complications Absent (%)	p-value
Facial pain	80.0	20.0	0.001
Epistaxis	54.5	45.5	0.067
Difficulty breathing	70.6	29.4	0.015
CSF rhinorrhea	100.0	0	0.001
Swelling/deformities	63.8	36.2	0.003

4. Discussion

The following discussion interprets the findings derived from the descriptive and inferential statistical analyses regarding facial injuries among patients in Ekiti, Nigeria. These results emphasize demographic factors, types of injuries, complications, and management strategies crucial for developing targeted interventions and refining clinical practices.

The majority of facial injury cases (37.7%) were found in the 21-30 age group, followed by the 11-20 age group (27.9%). These findings align with existing literature suggesting that young adults are at higher risk for traumatic injuries due to increased exposure to potentially hazardous activities [15]. The incidence of facial injuries dwindles in older age brackets, possibly reflecting reduced activity levels or improved safety practices among older populations [16]. The demographic data in this study reveal a significant male predilection (85.2%) among patients, consistent with global trends where males tend to engage in riskier behaviors leading to higher injury rates [17]. The urban predominance (67.2%) indicates a possible correlation with urban lifestyle factors such as increased vehicular density, suggesting that targeted awareness campaigns could mitigate injury risks in urban areas [18]. High education levels noted in the cohort may contribute to greater awareness of safety practices, but the presence of alcohol consumption and drug indulgence warrants further investigation into their roles as risk factors [19].

This study highlights road traffic crashes as the most prevalent cause (47.5%) of facial injuries, followed by assaults and domestic injuries (21.3% and 14.8%, respectively). This finding underscores the urgent need for improved road safety measures and community programs designed to address violence and domestic accidents [20]. The alarming rate of road traffic incidents signifies an area for public health interventions focused on pedestrian safety and enforcement of traffic regulations.

Facial soft tissue injuries were most common (93.4%), with bone fractures occurring less frequently (18.0%) in this study. This pattern suggests that while soft tissue injuries are more prevalent, they may be indicative of underlying severe trauma that could benefit from more aggressive management strategies [21]. Prompt intervention is essential to prevent complications associated with delayed wound care, including infections [22]. Just under half of the patients (45.9%) did not exhibit systemic injuries, indicating that many facial injuries occur in isolation. However, the presence of orthopaedic and ophthalmic injuries in some patients emphasizes the importance of a multidisciplinary treatment approach [23]. This study highlights clinical features, with facial pain being the most reported symptom (95.1%), illustrating the significant discomfort associated with these injuries and the subsequent clinical need for effective pain management protocols [5].

This study reveals that complications were present in less than half (49.2%) of the patients, with wound infections and trismus being the most notable (9.8% each). This finding highlights the importance of meticulous post-operative care in preventing these complications [24]. The management approach in this study, primarily conservative or soft tissue repair (36.1% and 31.1%, respectively), indicates a preference for less invasive treatments [24]. The low utilization of surgical interventions suggests that many patients may not require extensive surgical management, benefiting from conservative care strategies [25].

The inferential statistics revealed significant associations between various factors. Younger adults were more likely to experience road traffic crashes ($p = 0.001$), emphasizing the need for prevention strategies tailored to this demographic [24]. Additionally, higher education levels correlated with increased rates of soft tissue injuries, potentially suggesting that educated individuals may engage in higher-risk activities ($p = 0.001$), which contradicts the initial assumption that education improves compliance with safety practices [26,27]. Furthermore, patients with systemic injuries were at higher risk for complications ($p = 0.004$), underscoring the need for comprehensive assessments to identify at-risk patients during initial evaluations [4]. This study highlights that the source of referral significantly impacts the type of management provided ($p < 0.05$), indicating a need for better clinical pathways for facial injury management to ensure appropriate treatment modalities [28,29]. Lastly, the relationship between clinical features and complications points to specific symptoms, such as facial pain and difficulty breathing, being associated with higher complication rates ($p < 0.05$), highlighting the need for careful monitoring of these symptoms post-injury [30,31].

5. Limitations

While this study offers valuable insights into the nature of facial injuries, certain limitations must be acknowledged. First, the findings are derived from a single center, which may limit the generalizability of the results to other regions or populations. Second, the reliance on self-reported data may introduce bias, particularly regarding social habits. Third, the study was limited by its sample size and the potential for incomplete data submissions. Additionally, the six-month study period may not capture seasonal variations in injury patterns. Future multicenter studies with larger sample sizes and longer durations are recommended to validate these findings.

6. Conclusion

This study concluded that road traffic crashes among young adult males in urban areas are the primary drivers of facial

injuries in Ekiti, Nigeria. These injuries typically present with distinct clinical features such as facial pain and nasal blockage, and are associated with a notable risk of complications, underscoring the need for targeted and comprehensive care protocols. The significant associations identified between sociodemographic factors, injury characteristics, and outcomes provide valuable insights for clinical practice and policy development.

7. Recommendations

To mitigate the incidence of road traffic-related facial injuries, we recommend the implementation of targeted public awareness campaigns emphasizing road safety and the severe consequences of reckless driving. It is critical to advocate for and enforce road safety regulations, particularly the mandatory use of helmets and seatbelts. Healthcare systems should enhance capacity by training professionals in specialized facial injury management and developing standardized clinical guidelines that promote interdisciplinary collaboration for effective complication management. We encourage further research into the long-term psychological and functional outcomes for survivors of facial injuries. Additionally, establishing robust surveillance systems to monitor injury trends is essential for evaluating the effectiveness of current interventions and guiding the development of future public health initiatives and educational programs for high-risk populations.

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Ethics Statement

This study was conducted in accordance with the Declaration of Helsinki (June 1964) and subsequent amendments. Ethical approval was obtained from the Ethics and Research Committee of Ekiti State University Teaching Hospital, Ado-Ekiti, Nigeria (Protocol No. EKSUTH/A67/2026/01/006). Written informed consent was obtained from all adult participants prior to enrollment in the study. For minor participants (below 18 years of age), written informed consent was obtained from their parents or legal guardians, with assent obtained from the minors where appropriate. Participants were assured of the confidentiality of their information and their right to withdraw from the study at any time without any consequences to their medical care. All data were anonymized prior to analysis to protect patient privacy.

Data Availability Statement

The data that support the findings of this study are available from the corresponding author upon reasonable request. The data are not publicly available due to privacy and ethical restrictions, as they contain information that could compromise the privacy of research participants. Access to the data will be granted to qualified researchers who submit a methodologically sound proposal and obtain necessary ethical approvals. Requests for data access should be directed to the corresponding author, Dr. Waheed Atilade Adegbiyi.

Author Contributions

Waheed Atilade Adegbiyi: Conceptualization, study design, methodology, data collection, supervision, project administration, resources, validation, investigation, writing—original draft preparation, writing—review and editing, corresponding author.

Khadijat Ayomide Adegbiyi: Data curation, formal analysis, software, validation, visualization, writing—original draft preparation, writing—review and editing.

Moruf Babatunde Yusuf: Methodology, investigation, resources, writing—review and editing, supervision.

Mary Okon: Data collection, investigation, writing—review and editing, project administration.

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Ezekiel Oyeniya Oyewole: Methodology, resources, writing—review and editing, supervision.

Conflict of Interest

The authors declare no conflicts of interest. All authors have completed the ICMJE uniform disclosure form and declare no competing interests.

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Generative AI Statement

During the preparation of this work, the authors used artificial intelligence tools (including large language models) for limited purposes, including language refinement, grammar checking, and assistance with formatting of the manuscript. All AI-generated suggestions were critically reviewed, edited, and approved by the authors, who take full responsibility for the final content, accuracy, and integrity of the work. No AI tools were used for data analysis, interpretation of results, or generation of scientific content, conclusions, or recommendations. The authors confirm that the core intellectual contributions, research design, data collection, analysis, interpretation, and conclusions remain the sole work of the human authors.

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