



WESTERN NIGERIA JOURNAL OF MEDICAL SCIENCES (WNJMS)

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MANAGED AT A TEACHING HOSPITAL IN EKITI STATE, NIGERIA**

PATTERN AND EARLY OUTCOME OF BURN INJURIES AMONG CHILDREN MANAGED AT A TEACHING HOSPITAL IN EKITI STATE, NIGERIA

Babatola AO^{1,2}, Ogundipe KO^{3,4}, Kadiri IA^{3,4}, Ajite AB^{1,2}, Adeniyi AT^{1,2}, Ogundare EO^{1,2}, Oluwayemi IO^{1,2}, Olatunya OS^{1,2}

¹Department of Paediatrics and Child Health, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria

²Department of Paediatrics and Child Health, Ekiti State University Teaching Hospital, Ado-Ekiti, Ekiti State, Nigeria

³Department of Plastic and Reconstructive Surgery, Ekiti State University, Ado-Ekiti, Ekiti State, Nigeria

⁴Department of Plastic and Reconstructive Surgery, Ekiti State University Teaching Hospital, Ado-Ekiti, Ekiti State, Nigeria

Correspondences: Babatola AO, Department of Paediatrics and Child Health, Ekiti State University, Ado-Ekiti, Nigeria. Telephone: +2348035682315; E-mail: adefunke.babatola@eksu.edu.ng

ABSTRACT

Introduction

Burn injury is a major cause of morbidity and mortality among children, particularly in low- and middle-income countries. Despite being largely preventable, it remains a significant public health problem. This study determines the pattern, management, and early outcomes of burn injuries among children admitted to a teaching hospital in Ekiti State, Nigeria.

Methods

This retrospective descriptive study reviewed the records of children aged below 18 years admitted with burn injuries between January 2015 and December 2019. Information on sociodemographic characteristics, burn patterns, aetiology, management, duration of hospitalisation, complications, and treatment outcomes was extracted and analysed using descriptive and inferential statistics. Statistical significance was set at $p < 0.05$.

Results

Twenty-seven children were admitted with burn injuries, representing 0.4% of paediatric admissions during the study period. The median age was 24 months, and males predominated (59.3%). Scald injury was the commonest type of burn (63.0%), followed by flame burns (33.3%) and electrical burns (3.7%). Most injuries occurred at home

(96.3%) and were unintentional (96.3%). Eighteen (66.7%) patients were discharged, seven (25.9%) were discharged against medical advice, one (3.7%) died, and one (3.7%) was referred. Patients with burns involving 21–50% of the total body surface area had significantly longer hospital stays ($p = 0.03$) and poorer outcomes ($p = 0.02$).

Conclusion

Childhood burn injuries were predominantly unintentional scald injuries occurring at home among children aged two years and below. Strengthening caregiver education, improving home safety, and expanding health insurance coverage may reduce the burden of childhood burns.

Keywords: Burn injury; children; scald; flame burn; outcome; Nigeria.

INTRODUCTION

Burn injury is one of the leading causes of injury-related morbidity and mortality among children worldwide and remains a major public health concern, particularly in low- and middle-income countries.^{1–3} Although most childhood burn injuries are preventable, they continue to impose substantial physical, psychological, social, and economic burdens

on affected children, their families, and healthcare systems.^{4,5}

Globally, burns account for approximately 180,000 deaths annually, with the overwhelming majority occurring in low- and middle-income countries.² Children are particularly vulnerable because of their natural curiosity, increasing mobility, inability to recognise hazards, and dependence on adult supervision.^{6,7} In addition to mortality, burn injuries frequently result in prolonged hospitalisation, permanent disfigurement, functional disability, psychological trauma, and significant financial hardship.^{4,8}

The epidemiology of childhood burns varies according to age, socioeconomic status, cultural practices, and environmental conditions. Scald injuries predominate among younger children, whereas flame burns become increasingly common among older children and adolescents.^{9–11} In many developing countries, overcrowded living conditions, unsafe cooking practices, the use of open flames and kerosene stoves, poor housing conditions, and inadequate caregiver supervision substantially increase the risk of burn injuries.^{12–14}

Several studies from Nigeria and other African countries have reported that most childhood burns occur within the home and are largely preventable.^{15–19} Despite these observations, burn injuries remain an important cause of paediatric hospital admissions, particularly in resource-limited settings where specialised burn care facilities are scarce.

Understanding the local epidemiology of childhood burns is essential for planning preventive strategies, allocating healthcare resources, and improving clinical outcomes. However, data from Ekiti State remain limited.

This study therefore aimed to determine the pattern, management, and outcomes of burn

injuries among children admitted to a teaching hospital in Ekiti State, Nigeria.

METHODS

Study design and setting

This was a retrospective descriptive study of children managed for burn injuries at the Department of Paediatrics of Ekiti State University Teaching Hospital, Ado-Ekiti, Ekiti State, Nigeria. The hospital is a tertiary healthcare institution that serves as a referral centre for Ekiti State and neighbouring states in southwestern Nigeria. The hospital provides specialised paediatric, surgical, and emergency services, including the management of burn injuries.

Study population

The study included all children aged less than 18 years who were admitted with burn injuries between **January 2015 and December 2019**. Children with minor burns, incomplete medical records or missing essential clinical information were excluded from the study.

Data collection

Information was extracted from patients' case notes, admission registers, theatre records, and nursing records using a structured data extraction form.

The following variables were collected:

- Age
- Sex
- Place of residence
- Cause of burn injury
- Place where the injury occurred
- Percentage of total body surface area (TBSA) burned
- Burn depth
- Time from injury to presentation
- Pre-hospital treatment
- Associated injuries
- Treatment received
- Duration of hospitalisation
- Complications
- Treatment outcome

Burn severity was assessed using the percentage of total body surface area affected, estimated with Lund and Browder charts.

Outcome measures

The primary outcome measures were:

- Pattern of burn injuries
- Duration of hospitalisation
- Complications
- Treatment outcome (discharge, discharge against medical advice, referral, or death)

Statistical analysis

Data were entered and analysed using **IBM SPSS Statistics version 25** (IBM Corp., Armonk, NY, USA).

Categorical variables were summarised as frequencies and percentages, whereas continuous variables were summarised using the mean $\pm$ standard deviation or median with interquartile range, depending on the distribution of the data.

Associations between categorical variables were assessed using the Chi-square test or Fisher's exact test where appropriate. Continuous variables were compared using the Student's *t*-test or the Mann-Whitney *U* test as applicable.

A *p* value of **<0.05** was considered statistically significant.

Ethical considerations

Ethical approval was obtained from the Ethics and Research Committee of the University Teaching Hospital (EKSUTH/A67/2019/10/008). Patient confidentiality was maintained throughout the study by anonymising all extracted data.

RESULTS

A total of **27 children** with burn injuries were admitted during the five-year study period, accounting for **0.4% of all paediatric admissions**. The median age was **24 months**

(interquartile range: **12–48 months**), with children aged **≤ 2 years** constituting the largest age group. There were **16 males (59.3%)** and **11 females (40.7%)**, giving a male-to-female ratio of **1.5:1**. The socio-demographic characteristics of the patients are presented in **Table 1**.

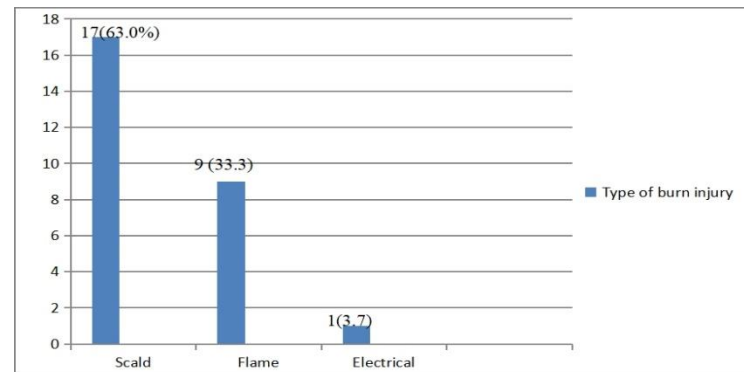


Figure 1: Distribution of patients by type of burn injury

Table 1: Distribution of patients by gender and type of burn

Gender	Type of Burns			Total (%)
	Electrical burns N (%)	Flame N(%)	Scald N (%)	
Male	1(100.0)	7(77.8)	8(47.8)	16(59.3)
Female	0(0.0)	2(22.2)	9(52.9)	11(40.7)
Total	1(100.0)	9(100.0)	17(100.0)	27(100.0)

Fisher's exact test =3.014, df =2, p =0.22

Scald injury was the commonest mechanism of burn, occurring in **17 (63.0%)** patients, followed by flame burns in **9 (33.3%)**, while **one patient (3.7%)** sustained an electrical burn. Most burn injuries occurred within the home environment (**26; 96.3%**) and were accidental in nature (**26; 96.3%**). The distribution of burn mechanisms according to age is shown in **Table 2**.

Table 2: Presentation of the burn patients

Characteristics	Frequency (n=27)	Percentage (%)
Pattern of burn		
Accidental	26	96.3
Intentional	1	3.7
Place of incident		
Home	26	96.3
Outside the home	1	3.7
Parts of the body		
Multiple sites	22	81.5
Upper limbs	3	11.1
Lower limbs	2	7.4
Percentage burnt surface area		
0-10%	14	51.9
11-20%	9	33.3
21-50%	4	14.8

The percentage of **total body surface area (TBSA)** burned ranged from **2% to 60%**, with most patients sustaining burns involving **10–20% TBSA**. Partial-thickness burns were the predominant injury pattern, although full-thickness burns were observed in patients with more extensive injuries. The anatomical distribution and severity of burns are summarised in **Table 3**.

The majority of patients received conservative wound care, intravenous fluid resuscitation, analgesics, nutritional support, and appropriate antimicrobial therapy. Surgical intervention, including wound debridement and skin grafting, was performed when indicated.

The duration of hospital admission ranged from **2 to 46 days**. Patients with burns involving **21–50% TBSA** had significantly longer hospital stays than those with less extensive burns ($p = 0.03$). Similarly, increasing burn size was significantly associated with poorer treatment outcomes ($p = 0.02$).

Overall, **18 patients (66.7%)** were successfully treated and discharged, **7 (25.9%)** were discharged against medical

advice, **1 (3.7%)** was referred to another facility for further management, and **1 (3.7%)** died during admission. The mortality rate was therefore **3.7%**.

Burn wound infection was the commonest complication encountered, followed by wound contracture in patients with prolonged wound healing. The distribution of complications and treatment outcomes is presented in **Table 4**.

Table 3: Circumstances of the burn injury

Circumstances of the injury	Frequency (n=27)	Percentage (%)
Spilled /dipped body parts in hot liquid	16	59.3
Kerosene explosion	4	17.4
Petrol explosion	2	7.4
Canister explosion	1	3.7
Cooking gas explosion	1	3.7
Insert hand in hot coal	1	3.7
Guardian poured hot water on patient	1	3.7
Patient went to pick football under high tension wire	1	3.7
Agents that caused the burn		
Hot water	13	48.1
Hot rice	3	11.1
Hot stew	1	3.7
Flames	9	33.3
Electric current	1	3.7
*Materials applied to the burn at place of injury		
Tepid water	10	37.0
Corn paste	6	22.2
Raw egg	4	14.8
Honey	2	7.4
Others (engine oil, petroleum jelly)	2	7.4
No intervention documented	5	18.5

*Multiple substances applied by some patients

Table 4: Clinical outcome of the management of the burn cases

	Frequency (n=27)	Percentage (%)
Duration of admission		
0 – 3 days	6	22.2
4 -7 days	9	33.3
8-14 days	4	14.8
>14days	8	29.6
Outcome of admission		
Discharged	18	66.6
LAMA	7	25.9
Died	1	3.7
Referred to another facility	1	3.7
Source of payment of the hospital bill		
Self(out of pocket)	26	96.3
Social welfare	1	3.7

DISCUSSION

Burn injury in children, although largely preventable, remains an important cause of childhood morbidity and mortality worldwide.^{1–3} The prevalence of paediatric burns among admissions (excluding neonates) in the present study was **0.4%**, comparable to the **0.46%** reported in Ethiopia.¹⁸ Although relatively low, this finding highlights the need for sustained preventive measures and public health education.^{1,3}

The median age was **24 months**, with about half of the patients aged **2 years or younger**, reflecting the increased curiosity, mobility, and poor hazard awareness characteristic of this age group. Similar findings have been reported in Nigeria,^{19,20} whereas Gessesse and Yibeltal¹⁸ found that most patients were older than four years. This difference may reflect variations in study populations and injury mechanisms. Male predominance (male:female ratio **1.4:1**) was consistent with previous reports,^{19–22} probably because boys tend to be more physically active and adventurous. In contrast, the Ethiopian study reported a female predominance, possibly because older children predominated and scald and flame burns occurred with similar frequency.¹⁸

Scald injury was the commonest mechanism of burn, consistent with previous reports.^{4,23–26} In contrast, Oludiran *et al.*²⁷ reported flame burns as the predominant injury overall, although scald burns remained the commonest among children younger than three years. This difference may reflect the higher incidence of kerosene-related explosions associated with fuel adulteration in Benin City during the study period.^{28,29} Flame burns were the second commonest injury in our study, while electrical burns were least frequent, similar to previous reports.^{4,19,20}

Table 5: Relationship between age-groups and type of burns

Age-group(months)	Type of burns			Total n(%)
	Electrical burns n(%)	Flame n(%)	Scald n(%)	
1-24	0(0.0)	2(22.2)	12(70.6)	14 (51.9)
25-60	0(0.0)	0(0.0)	2(11.8)	2(7.4)
61 and above	1(100.0)	7(77.8)	3(17.6)	11(40.7)
Total	1(100.0)	9(100.0)	17(100.0)	27(100.0)

Fisher's exact test =10.49, df=4, **p = 0.03**

Most scald injuries resulted from hot water or food, while flame burns were mainly due to kerosene and petrol explosions. Except for electrical burns, all injuries occurred within the home, suggesting inadequate caregiver supervision. Similar observations have been reported previously.^{27–29} These findings underscore the need for improved parental supervision, stricter regulation against fuel adulteration, and sustained burn prevention campaigns through television, radio, schools, immunisation clinics, community programmes, and social media.^{1,3,8}

Consistent with earlier reports,^{4,25} almost all burns (**96.3%**) were unintentional. Only one case resulted from child abuse, whereas previous Nigerian studies documented higher rates of intentional burns related to harmful traditional practices for childhood convulsions.^{8,19} Strengthening implementation of the Child Rights Act, increasing public awareness, and enforcing laws against child abuse may help reduce such preventable injuries.

The median hospital stay (**7 days**) was shorter than the **18 days** reported from Tanzania and Ethiopia.^{4,26} This difference may reflect earlier presentation, less severe burns, or differences in referral patterns. Although our hospital lacks a dedicated burns unit and intensive care facilities, all patients with **21–50% total body surface area** burns required admission beyond two weeks, highlighting the impact of burn severity on resource utilisation. Regional specialised burns centres and standardised management protocols may improve outcomes and optimise available resources.

Most patients (**66.7%**) were discharged successfully, although some developed late complications, including malnutrition, wound sepsis, chronic ulcers, gangrene, and post-burn contractures, as reported elsewhere.²⁶ Mortality was low (**3.7%**), similar to reports from Imo and Edo States,^{19,27} but lower than figures reported from Tanzania, Rwanda, Pakistan, and other parts of Nigeria.^{4,12,14,21}

These differences are likely related to burn severity, timing of presentation, nutritional status, infection, and availability of specialised burn care.

The mean hospital bill was **₦17,423.00** (approximately **US\$50**), and almost all families financed treatment through out-of-pocket payments, consistent with previous Nigerian studies.^{6,7} Given that this amount excludes indirect costs such as transportation, loss of income, and rehabilitation, the financial burden on affected families is likely much greater. During the study period, the national minimum wage ranged from **₦18,000 to ₦30,000** per month, while a substantial proportion of Nigerians lived below the poverty line.^{30–33} Consequently, childhood burns may impose catastrophic health expenditure on many households. Expanding health insurance coverage and strengthening financial protection mechanisms are therefore essential to improve access to affordable burn care.^{6,7}

Limitations

This study is limited by its retrospective, hospital-based design, relatively small sample size, and the possibility of incomplete documentation, which may limit the generalisability of the findings. In addition, the absence of a dedicated burns unit means that the study may not fully represent severe burns managed at specialised centres. Nevertheless, it provides important data on the epidemiology, outcomes, and economic burden of childhood burns in Ekiti State and adds to the limited literature from southwestern Nigeria.

CONCLUSION

Childhood burn injuries remain an important cause of morbidity in Ekiti State, with children aged two years and below being the most frequently affected. Scald burns occurring within the home environment accounted for the majority of injuries,

highlighting the preventable nature of this public health problem. Burn size was significantly associated with prolonged hospitalisation and poorer treatment outcomes. Strengthening caregiver education, improving household safety, promoting early presentation to healthcare facilities, and expanding access to affordable healthcare services may reduce the incidence and severity of childhood burn injuries.

ACKNOWLEDGEMENTS: The authors appreciate Mr. Mustapha of the Health Information Management of the University Teaching Hospital for his assistance in retrieving the case notes of the patients

CONFLICTS OF INTEREST: The authors have no conflicts of interest to declare

SOURCE OF FUNDING: The research was self-sponsored. We did not receive any external funding.

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