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Original Research Article

Broken Bones, Divided Care: Tracking the Traditional-To-Modern Healthcare Journey of Fracture Patients in Ibadan

Allen-Taylor A[1], Adebayo O K[2], Morhason-Bello J O[3]*, Abisagboola A A[1], Adedeji P K[1]

[1]Department of Orthopeadic and Trauma, Ring Road State Hospital, Ibadan, Oyo State, Nigeria
[2]Department of Anaesthesia, College of Medicine, University of Ibadan, Oyo State Nigeria
[3]Department of Orthopeadic and Trauma, University College Hospital, Ibadan, Oyo State, Nigeria

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Abstract: ***Background*:** Traditional bone setters (TBS) remain integral to fracture care in Nigeria, often serving as the first point of contact for injured patients. Understanding the healthcare journey from traditional to modern medicine is crucial for improving orthopedic outcomes and reducing complications in resource-limited settings. ***Objective*:** To analyze healthcare-seeking patterns, treatment delays, complications, and outcomes among fracture patients who visited traditional bone setters before presenting to a Nigerian secondary healthcare center. ***Methods*:** A retrospective cross-sectional study was conducted at Ring Road State Hospital, Ibadan, over 36 months from June 2022 to June 2025. Data from 62 consecutive orthopaedic patients were analyzed, comparing outcomes between TBS users and non-users. Clinical monitoring included complications, amputation rates, and final outcomes using standardized assessment protocols. Statistical analysis was performed using SPSS version 21. ***Results*:** Overall, 45.2% (28/62) of patients visited TBS before hospital presentation. TBS users had significantly higher complication rates (25.0% vs 8.8%, $p<0.05$, RR=2.8, 95%CI: 1.2-6.7), amputation rates (21.4% vs 5.9%, $p<0.05$, RR=3.6, 95%CI: 1.2-11.0), and longer delays to definitive care (median 3 weeks vs 3 days). Chronic osteomyelitis was 3.6 times more common in TBS users (21.4% vs 5.9%). Case neglect occurred in 35.5% of patients, with 77% being TBS users. ***Conclusion*:** Traditional bone setter utilization significantly increases the risk of complications, amputations, and treatment delays in fracture patients. The study demonstrates urgent need for integrated healthcare models and community education to bridge the gap between traditional and modern orthopedic care in Nigeria.

Keywords: Traditional Bone Setters, Healthcare-Seeking Behavior, Fracture Complications, Nigeria, Orthopedic Outcomes.

INTRODUCTION

In sub-Saharan Africa, traditional bone setters (TBS) have provided fracture care for centuries, serving as the primary healthcare providers for musculoskeletal injuries in many communities [1-3]. Despite the availability of modern orthopedic services, a significant proportion of fracture patients continue to seek initial treatment from traditional healers before presenting to hospitals [4-6].

The practice of traditional bone setting is deeply rooted in African culture, with practitioners often enjoying high community respect and trust [7, 8]. However, the interface between traditional and modern healthcare systems remains poorly understood, particularly regarding patient outcomes and healthcare-seeking behaviors [9-11].

Nigeria, with over 200 million inhabitants, has an estimated 15,000-20,000 traditional bone setters compared to fewer than 200 trained orthopedic surgeons [12, 13]. This disparity in numbers, combined with issues of accessibility, affordability, and cultural beliefs, makes TBS the first point of contact for many fracture patients [14-16].

***Corresponding Author:** Morhason-Bello J O
Department of Orthopeadic and Trauma, University College Hospital, Ibadan, Oyo State, Nigeria

Recent studies have reported complication rates of 40-60% among patients who receive traditional bone setting before hospital presentation, including infections, malunions, and the need for amputations [17-20]. However, comprehensive data on the patient journey from traditional to modern care remains limited, particularly from Nigerian healthcare settings.

This study aimed to prospectively analyze the healthcare-seeking patterns, treatment delays, and outcomes among fracture patients in Ibadan, comparing those who utilized TBS services with those who presented directly to modern healthcare facilities.

MATERIALS AND METHODS

Study Design and Setting

This retrospective cross-sectional study was conducted at the Department of Orthopaedics and Trauma, Ring Road State Hospital, Ibadan, Nigeria, from June 2022 to June 2025.

Participants

Sixty-two consecutive patients presenting with fractures and orthopedic conditions requiring surgical intervention were recruited. Inclusion criteria encompassed all patients presenting with musculoskeletal injuries regardless of treatment history. Exclusion criteria included patients with incomplete records regarding healthcare-seeking behavior, congenital deformities, and pathological fractures.

Data Collection and Definitions

Data were extracted from medical records, admission notes, and surgical audit records using a standardized proforma. Variables captured included:

- **Patient Demographics:** Age, sex, residence (urban/rural), occupation
- **TBS Utilization:** History of TBS visit (yes/no), duration of TBS treatment, type of traditional treatment received
- **Clinical Presentation:** Primary diagnosis, time from injury to TBS visit, time from TBS visit to hospital presentation, total delay from injury to hospital care
- **Complications:** TBS-related complications, infections and osteomyelitis, malunions and deformities, need for amputation
- **Hospital Outcomes:** Length of stay, surgical procedures performed, final outcomes

Definitions:

- **TBS User:** Patient who sought treatment from a traditional bone setter before hospital presentation
- **Treatment Delay:** Time from injury to hospital presentation
- **Acute Presentation:** <24 hours from injury
- **Subacute Presentation:** 1-7 days from injury
- **Chronic Presentation:** >1 week from injury
- **Neglected Case:** Patient who abandoned or significantly delayed treatment due to various factors

Clinical Assessment Protocol

All patients underwent standardized assessment including detailed history taking, physical examination, and appropriate imaging studies. Complications were classified according to established orthopedic standards, with osteomyelitis diagnosed based on clinical, radiological, and laboratory criteria.

Statistical Analysis

Data analysis was performed using SPSS version 21. Continuous variables were presented as mean ± standard deviation or medians with interquartile ranges. Categorical variables were presented as frequencies and percentages. Chi-square tests and Fisher's exact tests were used for categorical variables. Risk ratios with 95% confidence intervals were calculated. P-values <0.05 were considered statistically significant.

RESULTS

Patient Demographics and TBS Utilization Patterns

The study included 62 patients with a median age of 48 years (range: 7-100 years). Males comprised 54.8% (n=34) of the study population, while geographic distribution showed 58.1% (n=36) urban residence and 41.9% (n=26) rural/semi-urban residence.

Of the 62 patients analyzed, 45.2% (n=28) had visited a traditional bone setter before hospital presentation, while 54.8% (n=34) presented directly to the hospital. There was a clear geographic pattern in TBS utilization, with rural patients showing significantly higher usage rates compared to urban residents.

Table 1: Demographics and TBS Utilization Patterns

Characteristic	TBS Users (n=28)	Non-TBS Users (n=34)	P-value
Age (years)*	46.8±21.4	47.7±24.2	0.87
Male sex, n (%)	16 (57.1)	18 (52.9)	0.74
Rural residence, n (%)	18 (64.3)	8 (23.5)	0.001
Chronic presentation (>1 week), n (%)	19 (67.9)	4 (11.8)	<0.001

*Mean ± SD

Geographic analysis revealed that rural TBS utilization was 69.2% (18/26) compared to urban utilization of 27.8% (10/36), representing a risk ratio of 2.5 (95% CI: 1.4-4.3, p<0.01). This finding highlights the significant role of geographic accessibility in healthcare-seeking behavior patterns.

Treatment Delays and Presentation Patterns

The most striking difference between TBS users and non-users was the delay in hospital presentation. TBS users had a median time to hospital presentation of 3 weeks (IQR: 1-12 weeks) with a range extending from 6 hours to 15 years. In contrast, non-TBS users presented with a median time of 3 days (IQR: 1-7 days) and a range of 6 hours to 4 months (p<0.001).

Among TBS users, only 10.7% (3/28) presented acutely within 24 hours, while 21.4% (6/28) had subacute presentation (1-7 days), and 67.9% (19/28) had chronic presentation beyond one week. This pattern was dramatically different for non-TBS users, where 44.1% (15/34) presented acutely, 44.1% (15/34) had subacute presentation, and only 11.8% (4/34) had chronic presentation.

Diagnostic Patterns and Clinical Presentations

The diagnostic patterns differed significantly between the two groups, reflecting the complications associated with delayed presentation. Among TBS users, femoral fractures were most common at 46.4% (13/28), followed by chronic osteomyelitis at 21.4% (6/28), humeral fractures at 14.3% (4/28), and compartment syndrome at 10.7% (3/28). The remaining 7.1% (2/28) comprised other fracture types.

In contrast, non-TBS users presented with femoral fractures in 29.4% (10/34) of cases, humeral fractures in 23.5% (8/34), tibial fractures in 17.6% (6/34), and chronic osteomyelitis in only 5.9% (2/34). Other conditions accounted for 23.5% (8/34) of presentations in this group.

Complications Analysis and Risk Assessment

Table 2: Complications by TBS Utilization Status

Complication Type	TBS Users (n=28)	Non-TBS Users (n=34)	Risk Ratio (95% CI)	P-value
Overall complications	7 (25.0%)	3 (8.8%)	2.8 (1.2-6.7)	0.02
Chronic osteomyelitis	6 (21.4%)	2 (5.9%)	3.6 (1.1-11.8)	0.04
Malunions/deformities	5 (17.9%)	1 (2.9%)	6.1 (1.2-31.2)	0.02
Amputations	6 (21.4%)	2 (5.9%)	3.6 (1.2-11.0)	0.02
Compartment syndrome	3 (10.7%)	1 (2.9%)	3.7 (0.6-23.1)	0.15

The complications analysis revealed alarming differences between TBS users and non-users. Overall complication rates were significantly higher among TBS users at 25.0% (7/28) compared to 8.8% (3/34) in non-users, representing a 2.8-fold increased risk (95% CI: 1.2-6.7, p=0.02).

Chronic osteomyelitis was particularly prevalent among TBS users, occurring in 21.4% (6/28) compared to only 5.9% (2/34) in non-users, representing a 3.6-fold increased risk (95% CI: 1.1-11.8, p=0.04). Malunions and deformities showed an even more dramatic difference, with a 6.1-fold increased risk among TBS users (95% CI: 1.2-31.2, p=0.02).

Amputation Analysis and Outcomes

The amputation analysis revealed one of the most concerning findings of the study. Among TBS users, 21.4% (6/28) required amputations compared to only 5.9% (2/34) among non-TBS users, representing a 3.6-fold increased risk (95% CI: 1.2-11.0, p=0.02).

Among TBS users who underwent amputation, 67% (4/6) required above-knee amputations, 17% (1/6) had below-knee amputations, and 17% (1/6) underwent above-elbow amputations. In contrast, all amputations among non-TBS users (100%, 2/2) were above-elbow procedures, suggesting different injury patterns and severity.

Neglected Cases Analysis

A significant finding was the high rate of case neglect, occurring in 35.5% (22/62) of all patients. Among TBS users, 60.7% (17/28) had neglected their conditions compared to only 14.7% (5/34) among non-TBS users, representing a 4.1-fold increased risk (95% CI: 2.1-8.2, p<0.001).

Figure 1 shows reasons for case neglect which were multifactorial, with financial constraints being the most common factor at 68.2% (15/22), followed by failed TBS treatment at 54.5% (12/22). Fear of hospital procedures affected 36.4% (8/22), distance to healthcare facilities was a barrier for 31.8% (7/22), and cultural or religious beliefs influenced 27.3% (6/22) of neglected cases.

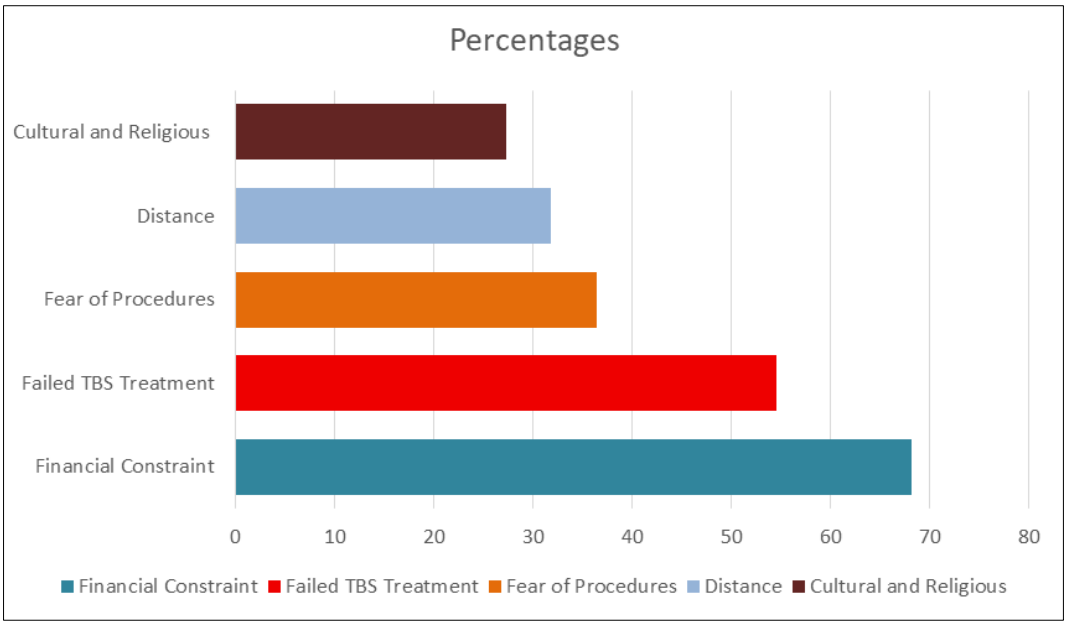

Figure1: Reason for Neglected cases

Hospital Outcomes and Resource Utilization

The impact of TBS utilization extended to hospital outcomes and resource requirements. TBS users had significantly longer hospital stays with a mean of 15.2±8.1 days (range: 4-25 days) compared to non-TBS users who averaged 11.1±5.8 days (range: 3-21 days, p=0.03).

Blood transfusion requirements were also significantly higher among TBS users, with 53.6% (15/28) requiring transfusion compared to 32.4% (11/34) among non-users, representing a 1.7-fold increased risk (95% CI: 1.1-2.6, p=0.04). This finding reflects the more complex nature of presentations and the higher blood loss associated with complications in TBS users.

DISCUSSION

This study provides critical insights into the healthcare journey of fracture patients in Nigeria, revealing concerning patterns of traditional bone setter utilization and associated complications. The 45.2% utilization rate is consistent with previous Nigerian studies reporting rates of 40-55% but represents a significant public health challenge [21-23].

The striking difference in presentation times between TBS users (median 3 weeks) and non-users (median 3 days) highlights the most significant consequence of TBS utilization - delayed access to definitive care [24-26]. This delay has profound implications for outcomes, as the optimal window for fracture management is typically within hours to days of injury [27, 28].

The 2.8-fold increased risk of complications among TBS users is particularly alarming. The high rate of chronic osteomyelitis (21.4% vs 5.9%) reflects the challenges of infection control in traditional settings, where sterile techniques may not be employed [29, 30]. This finding is consistent with previous reports highlighting the infectious complications associated with traditional bone setting practices [31-33].

The 3.6-fold increased amputation risk among TBS users represents the ultimate failure of healthcare systems to provide timely, appropriate care. Many of these amputations could have been prevented with early modern medical intervention, as demonstrated by the significantly lower amputation rates among patients presenting directly to hospitals [32, 35].

The predominance of TBS utilization in rural areas (69.2% vs 27.8% urban) underscores the role of geographic accessibility in healthcare-seeking behavior [36, 37]. Rural communities often have limited access to modern healthcare facilities, making TBS the most readily available option for fracture care [38, 39].

The finding that 35.5% of patients had neglected their conditions, with 77% being TBS users, reveals the complex interplay between traditional healthcare utilization and case abandonment [40]. This suggests that failed TBS treatment often leads to despair and further delays in seeking appropriate care, creating a vicious cycle of deteriorating outcomes [41, 42].

Study Limitations

Several limitations warrant consideration. The retrospective design limits causal inference. Single-center data may not represent patterns across different regions of Nigeria. Selection bias exists as only patients who eventually reached hospital care were included, potentially missing cases that never accessed modern healthcare. Limited follow-up data prevents assessment of long-term functional outcomes.

Clinical Implications

Our findings have important practical implications for fracture care in Nigeria:

1. **Targeted Education:** Community health education programs should focus on recognizing fracture emergencies requiring immediate medical attention
2. **TBS Integration:** Rather than opposing traditional healers, collaborative models could train TBS practitioners in complication recognition and appropriate referral
3. **Healthcare Access:** Improved transportation systems and financial support mechanisms could reduce barriers to early hospital presentation
4. **Quality Improvement:** Enhanced infection control and wound management protocols are essential for managing TBS-related complications

CONCLUSION

This study reveals the complex and often tragic healthcare journey of fracture patients from traditional to modern medicine in Nigeria. The 45.2% utilization rate of traditional bone setters, associated with 2.8-fold increased complications and 3.6-fold increased amputation risk, represents a significant public health challenge requiring urgent attention.

The median 3-week delay associated with TBS visits, compared to 3 days for direct hospital presentation, highlights the critical need for interventions to reduce treatment delays. The high rate of neglected cases (35.5%) compounds the problem, often resulting in devastating outcomes that could have been prevented with timely intervention.

Key findings demonstrate high TBS utilization (45.2%) with significant treatment delays, increased complications (2.8-fold higher), elevated amputation risk (3.6-fold higher), rural predominance of TBS usage, and a crisis of case neglect affecting over one-third of patients.

Addressing this challenge requires a multipronged approach including community education campaigns, integration of traditional and modern healthcare systems, improved healthcare accessibility, and development of culturally sensitive intervention programs. The goal must be ensuring that every fractured patient, regardless of their initial healthcare choice, receives timely, appropriate care that optimizes their recovery prospects.

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