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Traditional Bone Setters in Port Harcourt Nigeria: Perception, Patronage and Practice: A Prospective Cross-sectional Study

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Authors' contributions

This work was carried out in collaboration between all authors. All the authors made substantial contributions in the study design, implementation and write up. All authors read and approved the final manuscript.

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ABSTRACT

Background: Treatment of musculoskeletal disorders by Traditional Bone Setters (TBS) is as old as man's effort at caring for his bone. In spite of the numerous limb-deforming and limb-threatening complications caused by this unorthodox method of care, the TBS still enjoy high patronage in the developing world.
Aim: To evaluate the patronage and practice as well as the perception of patients receiving orthopaedic care at the University of Port Harcourt Teaching Hospital (UPTH) concerning traditional bone setters.
Methods: A prospective non-randomized cross sectional study of 192 patients presenting to the University of Port Harcourt Teaching Hospital from Jan 2013 to July 2014 with complications following TBS care of musculo-skeletal problems was undertaken. Relevant data was obtained from each patient and analyzed. Descriptive statistics are presented in the results.
Results: A total of 192 patients were seen; One hundred and fifteen (115; 64.6%) were males while seventy-eight (78; 35.4%) were female patients giving a male to female ratio of 1.5:1. Age of the patients ranged from 10months to 76years with mean age (35.1 ± 19.3) years. Patients aged

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(21-30) years and (31-40) years age groups cumulatively constituted 42.6% of the study population.
Students (65; 33.8%) and traders (41; 21.3%) were more common than other professions, with 73.4% of the population having at least secondary level of education.
Following injury, more patients (78.6%, n=151/192) visited the TBS first than hospitals (10.2%, n= 41/192) with 46.4% (n=89) of patients visiting at least 2 TBS before hospital visit. The most common reason (n=82/192) for TBS visit was the strong faith patients had in the TBS.
Conclusion: Strong faith in the competence of the TBS and perceived lower cost of care are key factors influencing perception and patronage of the TBS in Port Harcourt. Intervention programs need to address these key factors.

Keywords: Traditional bone setters; unorthodox treatment; patronage; awareness programs.

1. INTRODUCTION

Traditional bone setting is the practice of treating musculoskeletal disorders by untrained persons within a community setting using traditional appliances.

The practitioners are usually poorly educated and improperly trained persons with the craft claimed to have been inherited by ancestral or supernatural means [1-3].

Majority of these traditional bone setters still hold their methods and techniques in high secrecy. Some of their methods can best be described in scientific light as shrouded in mysteries [3-7].

The traditional bone setter (TBS) in the developing world, still receives high patronage [2,4,5]. The patronage usually cuts across social strata, religious beliefs and educational qualifications[6]. This high level of patronage may be due to the TBS' easy accessibility to rural dwellers that constitute a large fraction of the population in most developing nations [7] and societal strong faith in traditional healing methods [7]. Other reasons for the high patronage of TBS include presumed lower cost of care compared to orthodox care [3,8], the fear of possible amputation on presentation with orthopaedic problems in orthodox hospitals and frequent service interruptions from repeated industrial strike actions in hospitals [3,9].

Traditional Bone Setter treatment of musculoskeletal conditions has resulted in several limb and life threatening complications. These complications stem from poorly reduced fractures, improperly managed wounds, neurovascular compromise arising from tight application of splints at fracture sites [10-12] and the use of unsterile instruments to make scarifications and unsafe concoctions on the scarification wounds.

With growing interest in roles of traditional practices in fracture care especially in developing nations and the increasing call for the incorporation of TBS into orthodox care for musculo-skeletal conditions, a critical review of patronage and perception of TBS in the densely populated Port Harcourt metropolis becomes necessary. This will assist in policy formulation and planning necessary interventions.

1.1 Aim

The aim of this study is to evaluate the patronage and practice as well as the perception of patients receiving orthopaedic care at the University of Port Harcourt Teaching Hospital (UPTH) concerning traditional bone setters. The objectives will include the determination of characteristics of patients that patronize TBS, identification of the reasons for patronizing TBS, identifying the complications from treatment from TBS, assessing the direct financial cost of care at the TBS and comparing that with that from the UPTH.

2. METHODS

This was a prospective non-randomised study using a convenient sample size of one hundred and nine-two (192) patients who presented to the accident and emergency department, orthopaedic out-patient clinic and the children emergency ward of the UPTH with complications following previous visit to the traditional bone setter for musculoskeletal problems from January 2013 to June 2014.

These patients were administered with semi-structured questionnaire which was validated using an initial pilot of 20 patients.

Biodata and relevant information with regards to their visit to the traditional bone setter, number of

traditional bone setters visited, reasons for visit and reasons for leaving the TBS, duration of stay and other relevant aspects of the visit were obtained and analyzed.

Frequencies and cross tabulations were used to create two- way and multi-way tables. Charts and graphs were used to display appropriate variables. Statistical methods were carried out using the statistical package for social sciences (SPSS) 17 for windows (SPSS Inc. Chicago IL, USA).

3. RESULTS

A total of one thousand one hundred and twenty-two (1122) patients with musculoskeletal problems were seen at the study centre within the study period. One hundred and ninety-two (192) patients earlier visited the TBS before presenting to the hospital with complications. The figure represents 17.1% of all patients with musculo-skeletal conditions seen at the study center within the study period.

3.1 Gender and Age Distribution of Patients

One hundred and fifteen (115; 64.6%) were male while seventy-eight (78; 35.4%) were female patients giving a male to female ratio of 1.5:1. Age range was from 10 months to 76 yrs. Mean age was 35.1 ± 19.3 years. The 21-30years and 31-40 years age groups cumulatively constituted 42.6% of the study population.

3.2 Occupational Distribution of Patients

Students (65; 33.8%) and traders (41; 21.3%) were more common than other professions. The distribution of other occupations is as shown in Table 1.

3.3 Distribution of Educational Status

Nine-two (92; 47.9%) of the patients had secondary education, while forty-nine (49; 25.5%) had tertiary education.

3.4 Primary Type of Injury

The pattern of described initial injury type from primary symptom is as shown in Table 3. Most injuries were closed fractures (n=87; 45.3%). There were also spinal injuries (n=5; 2.6%) and multiply injured patients (n=5/192).

Table 1. Distribution of patients by occupation

Occupation	Frequency	Percentage (%)
Artisans	13	6.8
Professionals	16	8.3
Health workers	4	2.1
Traders	41	21.3
Civil servants	13	6.7
Farmers	8	4.1
Students	65	33.8
Fishermen	4	2.1
Teachers	6	3.1
Military personnel	6	3.1
Retirees	7	3.6
Unemployed	9	4.7
Total	192	100

Table 2. Educational status of patients

Educational status	Frequency	Percentage %
Primary	49	25.5
Secondary	92	47.9
Tertiary	44	22.9
Yet to start	1	0.5
None	7	3.6
Total	192	100

Table 3. Distribution of primary injury type

Injury type	Frequency	Percentage %
Closed fractures	87	45.3
Open fractures	13	6.8
Joint injuries	45	23.4
Soft tissue injuries	38	19.8
Bone infections	7	3.6
Spine injuries	5	2.6
Others	3	1.6

Table 4. Reasons for leaving hospital for TBS

Reasons	Frequency	Percentage %
Advice from nurse	2	4.9
Dissatisfaction	17	41.5
Fear of amputation	7	17.1
Cost of hospital Treatment	10	24.4
Health Workers' Strike	5	12.2
Total	41	100

3.5 Reasons for Patronising TBS

The decision to visit the TBS was made solely by the patients in 71 (40%) of cases and strongly influenced by the parents in 59 (30.7%), relatives 55 (28.6%) and friends in 7 (3.6%) of cases.

3.6 Reasons for Patronage and Stoppage of Treatment at TBS

This study also showed that 82 (42.7%) of the patients visited the TBS because of the strong faith they had in the competence of the TBS while 53 (27.6%) patronized because of the presumed cheaper cost of treatment at the TBS place. There were also 9 (4.7%) patients that visited the TBS due to health workers' strike and 3 (1.6%) that were advised by health workers to visit the TBS.

Table 5. Reasons given for TBS patronage

Reasons	Frequency	Percentage
Cost consideration	53	27.6
Health workers strike	9	4.7
Proximity	21	10.9
Quicker services	3	1.6
Faith In TBS competence	82	42.7
Dissatisfaction with treatment at initial hospital	8	4.2
Fear of amputation	13	6.8
Advice from health worker	3	1.6
Total	192	100

3.7 Reasons for TBS Exit

Poor results in terms of limb form and function was the reason for leaving the TBS in eighty-seven (45.3%) patients. Fifty-eight (30.2%) patients however left because of onset of emergency complications while five (2.6%) patients left because of increasing cost of care at the TBS place. Fewer than 20% (38) of the patients exited the TBS at completion of treatment.

3.8 Distribution of Primary Injuries

There were a total of ninety-three (48.4%) bony injuries, thirty-seven (19.3%) joint injuries and sixty-two (32.3%) soft tissue injuries seen in the study. The distribution of bony injuries is as shown in Table 6.

Table 6. Distribution of fractures

Fractured bone	Frequency	Percentage %
Clavicle	1	1.1
Humerus	19	20.4
Radius	15	16.1
Ulnar	7	7.5
Metacarpals	2	2.2
Femur	25	26.9
Tibia	21	22.6
Fibula	3	3.2
Total	93	100

The most commonly fractured bone was the femur (25; 26.9%). Five (5; 5.1%) of these fractures were proximal femoral fractures, twelve (18; 19.4%) were shaft fractures while two (2; 2.2%) were distal femoral fractures. Humeral fractures also had a significant contribution (19; 20.4%) with eleven (14; 15.1%) shaft fractures and five (5; 5.4%) supracondylar fractures.

The shoulder and elbow were the most commonly involved joints each accounting for 17 (45.9%) and 7 (18.9%) of joint injuries respectively.

3.9 Type of Treatment Received at TBS

At TBS presentation, these patients were treated with a variety of methods. Most of the patients received a combination of two or more of the methods. The most common (n=91/93 primary mode of treatment for the fractures was vigorous massage followed immediately by application of splints mostly made of raffia leaf axis sticks or wood knitted together by a piece of cloth. The splints were reapplied at several intervals and were limited to the fracture site in 100% of the splinted bony injuries. Joint and soft tissue injuries were mostly treated by deep massage followed immediately by bandaging. Four (4; 2.1%) patients had scarification with the wounds smeared with herbs and local concoctions when the primary procedure presumably failed to produce union. Two (2) of the patients who had closed fractures converted to open fracture had this kind of treatment. There were also nine (9; 4.7%) cases of wound dressing and three (3; 1.6%) cases of wound suturing.

One hundred and fifty-nine (159; 82.8%) of these cases had no form of analgesia in the course TBS treatment, twenty-one (21; 10.9%) had analgesia in oral form while 12(13.1%) had injectibles.

3.10 Duration of Stay with the TBS

Duration of treatment with the TBS ranged from 2 days to 13 months with sixty-seven (67; 34.9%) patients staying for 0-1 month while eleven (11; 5.7%) staying for more than 6months. Patients with lower limb fractures or dislocations were observed to have stayed longer with the TBS than those with upper limb injuries.

Table 7. Duration of stay at TBS place

Duration (months)	Frequency	Percentage %
0-1	67	34.9
1-2	51	26.6
2-4	48	25.0
4-6	15	7.8
>6	11	5.7
Total	192	100

3.11 Financial cost of Treatment at the TBS

A total of N4, 543,380 ($25,241 using official rate of N180/$1 i.e. rate as at the time of this study) was spent by 192 patients, with an average expenditure of N23, 663 per patient ($131/patient). The range was from N1,000 to N75,000. These values are approximated financial expenditure on TBS treatment as obtained from the patients.

Table 8. Approximated financial cost of TBS treatment

Cost (naira)	Frequency	Percentage %
0-1,000	6	0.8
1,000-5,000	32	16.7
5,000-10,000	39	20.3
10,000-20,000	67	34.9
>20,000	48	25
Total	192	100

4. DISCUSSION

Results from the evaluation of one- hundred and ninety-two patients with previous TBS visit shows that patients of all ages, gender, educational status and occupation patronize the TBS. this collaborate initial findings by Dada *et al*[6], Omololu et al. [13] and Thanni [14].

The 20-50 years age group constitutes 54.5% of the study population. This group, regrettably, represents the active work force of any economy and require the least level of limb compromise particularly in low income economic nations of Africa. El Hag and El Hag [15] in Sudan and Chowdhury et al. [16] in Bangladesh had similar pattern in their findings. The economic impact of having a less ambulatory and less effective work force in resource poor countries is difficult to estimate.

Also; traders, students, the unemployed, farmers and fishermen cumulatively constitute 66% of the study population. These groups pay for health care by 'out of pocket' method and will understandably seek healthcare in places where the cost is presumably cheaper. A health insurance scheme with wider coverage involving people in both formal and informal sectors of the economy may reduce TBS patronage by this group.

The pattern of injuries that presented at the TBS showed that the TBS 'manage' cases covering nearly all aspects of orthopaedic practice (limb fractures, spine injuries, joint pathologies, soft tissue injuries etc.). Similar finding was noted by other workers [1,3,17,18] and appears to demonstrate the TBS' lack of restraint and the craving for musculoskeletal conditions whose treatment far exceeds his capabilities. Closed fractures were however commonest type of injuries, accounting for 45.3% of injuries. Aries et al. [19] in central Ghana have noted that the TBS have most of their popularity from the treatment of these injuries. This is possibly because the treatment of such fractures is fairly simpler and most complications arising from poor treatment are enveloped in a soft tissue cover (hidden from the patient) particularly if the patient is able to achieve ambulation.

Public faith in the TBS is however still very strong as it served as the first port of call for 78.6% of patients in this study far out-numbering those that visited the health facility first (21.4%). While this remains outside the domain of influence of the orthopaedic surgeon, the reason for exiting hospital, as shown in Table 4, calls for concern. A large fraction (58.6%) of patients who first visited the hospital left due to the unwholesome attitude or ineptitude of health workers. More worrisome are the patients who were advised by health workers, to visit the TBS and the 41.5% of

patients who left because they were grossly dissatisfied with the slow, insensitive and ineffective services they got from the hospital staff. Ironically one of these patients returned from the TBS with a gangrenous limb. Dada [20] in his study in Lagos also noted that while fifty-two (52; 43%) of his study population presented first to health facilities prior to TBS presentation, sixteen (16; 30.8%) left hospital because they were dissatisfied with the services. He also noted that only two (3.8%) of the 52 patients that presented first to health facilities had early splintage of their fractured limbs. Other reasons he reported include; delays in getting treatment, inadequate explanation by health workers and abandonment by care givers. This may probably further heighten patronage of the TBS if proper steps are not taken to curb it.

The time interval between injury and presentation at the first care centre further demonstrates the strong faith of most of the study population on TBS practice. Within 48 hours of primary injuries, 60.9% of patients that visited the TBS first had presented there already as opposed to 36.6% of patients that visited a health facility. Also, 46.4% of patients visited more than one (1) TBS in search of appropriate treatment for their musculoskeletal problems before presenting to the hospital. The evidence suggests that the TBS was clearly a more appealing care facility for the treatment of musculoskeletal conditions than hospitals.

Contrary to most other studies, [13,21,22] that gave cost consideration as the commonest reason for TBS patronage, this study showed that strong faith in the competence of the TBS was a more important factor than cost consideration alone. Most patients (42.7%) in this study patronized the TBS because of their firm belief in the competence of the TBS and not because of a presumably more expensive cost of treatment in orthodox hospitals. Cost was however the second most common (27.6%) reason for TBS patronage. Efforts at reducing TBS patronage that do not address this fundamental concern may not make much progress.

This study also showed that service disruptions by health workers strikes, unsatisfactory treatment in some health facilities and unwarranted advice from some health workers also increase TBS patronage.

The decision to visit the TBS was strongly influenced by persons external to the patient in 60% of cases. The strong external influence has been termed “an external locus of control in decision making” by both Solagberu [23] and Ikpeme et al. [2] in their different studies and is blamed on the strong communal lifestyle and its associated high level of financial dependence of patients on relatives and friends within this sub-region.

The predominant mode of TBS treatment of fractures (n=91/93) from this study was massage followed by splinting of the limb, with the splint usually limited to the injury site leaving the joints above and beneath free. This mode of treatment is clearly ineffective in both reducing fractures and in maintaining reduction. This may perhaps explain the reason for the high rates of non-union and mal-union from TBS treatment of musculoskeletal problems. This corroborates the findings by Oginni [24] on the use of traditional splint for bone setting. Oginni also noted that the splints are usually applied once to twice a day in fresh fractures and once a week later on in the treatment. He further showed that scarifications with or without incantations were used following failure of primary treatment. The tight application of these splints converts them into ‘tourniquet-splints’ occluding blood flow the area of the limb beneath and distal to the splints, leading to limb gangrene. This was observed in16% of the patients who had this mode of treatment.

This study also showed some incursions by the TBS into orthodox practices. Three (3; 1.6%) patients had their wounds sutured at the TBS while Nine (9; 4.7%) had wound dressing with lotions, gauze and bandages. This portends an increased risk of infection of such wounds by limb and life threatening organisms as basic aseptic principles may not be followed.

Upper and lower limb fractures presented equally to the TBS but the most commonly injured bone presenting to the TBS as shown in this study was the femur, accounting for 26.9% of all bony injuries. This contrast studies by Chowdbury et al [16] and Memon et al. [17] which showed more humeral fractures; 20.3% and 32.7% respectively, although the sample size in the study by Memon and his colleagues was only 58 patients.

Whereas most patients (34.9%) received treatment from the TBS for less than 1month, 13.5% were with the TBS for more than 4 months. This group probably constitutes patients that visited more than one TBS and suggest high

tolerance level for the TBS among these patients in the face of delayed treatment expectations. This further buttresses patients' strong faith in the TBS.

The reason for TBS exit in eighty-seven (87; 45.3%) patients was because the outcome of TBS treatment fell below their expectations while fifty-eight (58; 30.2%) patients left due to onset of emergency complications. Ironically five (5) patients left because the cost of treatment in the TBS became too exorbitant for them. Similar findings were noted by Dada [20] in Lagos with 68 (50.7%) of patients existing the TBS for dissatisfaction with the rising cost of treatment.

The total financial cost of care as estimated by the 192 patients that received treatment at the TBS as seen in this study was four million, five hundred and forty three thousand, three hundred and eighty naira (N4,543,380:00 or $25,241 using official rate of N180 to USD1 at time of this study). This amounts to a mean expenditure of N23,663/ patient ($131/patient) this is a considerably high expenditure in developing nations. The more disturbing fact is the required additional expenditure for treatment of their complications arising from treatment by the TBS.

Another important finding from this study is that the approximated average cost of treatment (as obtained from the patients) in the TBS place was higher than the mean cost of non-operative management of the complications ($131 per patient versus $86 per patient respectively). This evidence indicates that the non-operative treatment of the primary injuries may even be cheaper in the study center when compared to TBS treatment in contrary to the general belief that the cost of treatment of musculoskeletal is cheaper in the TBS place. This finding which is similar to earlier findings by both Ikpeme et al. [2] and Dada et al. [6] in similar studies can be a veritable tool in aggressive public campaign against TBS patronage.

5. CONCLUSION

Patronage of TBS remains a common practice in Port Harcourt, Nigeria. This patronage is regardless of the social strata, level of education or economic earning of the patients. Such practices are associated with complications which often end up in the orthodox hospitals such as the UPTH for further treatment. While some of the patients patronized TBS on the erroneous belief that treatment by TBS is cheaper, more reliable and more effective, others patronize TBS because of dissatisfaction from treatment and frequent interruption in the services received in the orthodox hospitals.

Since this study confirm complications associated with treatment at the TBS, and that the actual cost of care at the TBS not comparatively cheaper when compared to the orthodox hospitals, more advocacy campaigns should be undertaken as to discourage patients in the region form patronising TBS.

ETHICS APPROVALS AND CONSENT TO PARTICIPATE

Study was approved by the Authorities and Ethical Review Committee of the University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria according to Helsinki Declaration 1975. Since there was no direct intervention on the patients or alteration of existing hospitals treatment protocols, consent to participate in the study from the patients was waived.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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