

Determinants of Orthopaedic Service Utilisation among Young People Aged 5-24 Years Old in Zambia

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Abstract

Background

Musculoskeletal conditions and/or disorders (MSDs), which affect muscles, tendons and ligaments, are the main causes of disability in many patients even though such disorders can be addressed through orthopaedic care. Little was known on the determinants of Orthopaedic services utilisation among young people between the ages of 5-24 in Zambia.

Methods

An embedded mixed methods design was used to conduct a hospital based cross sectional study that focused on high and low level of orthopaedic services utilisation. Stratified random sampling was used to draw a sample of 162 children and young people (5-24) from the hospital registers. Purposive sampling was used for eight service providers and convenient sampling for 10 parents and six young people. A data extraction checklist and self-administered questionnaires were for service providers. In-depth interviews with parents and a focus group discussion with six clients aged 15 to 24. Quantitative data was analysed using STATA version 14. Statistical tests included chi square, univariate and investigator led stepwise multiple logistic regression. Content and thematic analysis were done for qualitative data.

Results

41 percent of clients had high level of service utilisation. Physiotherapy clients were 84 percent significantly less likely to use services compared to clients from prosthetic and orthotics workshops [AOR 0.16; 95% CI 0.05, 0.59; P=0.01]. Clients living in low density residential areas were 86 percent times less likely to use Orthopaedic services compared to those in high density residential areas [AOR 0.14; 95% CI 0.05, 0.43; P<0.0001]. Participants without Insurance were 83 percent less likely to use Orthopaedic services compared to those with Insurance [AOR 0.17; 95% CI 0.05, 0.55; P=0.003]. At service level, barriers were inadequate financial and human resources. For care givers, key barriers included inadequate information about practices and other essential health actions to manage MSDs at home; costs of transport and fear of marital discord to discuss matters at length.

Conclusion The type of service used, area of residence and Health Insurance are significant determinants of Orthopaedic services utilisation. It is highly recommended that such services be decentralised to address key family barriers. Inadequate resources for orthopaedic service provision also need to be adequately addressed.

Background

Musculoskeletal conditions are the main drivers of the increase in years lived with disability over the past twenty years (Spiegel, 2008 and Kamper et al, 2016). The World Health Organisation (WHO) estimates that less than 5 percent of the population that have impairments have their orthopaedic needs met (WHO,

2005; WHO and UNICEF, 2015). MSDs need to be addressed, especially among children and young people. There is still a window of hope to prevent MSDs from becoming disabling conditions if tackled early enough. There is need to build quality human capital and improve productivity in future as well. However, very little was known about the level of orthopaedic service utilisation and associated factors in Zambia. The main objective of this study was to examine, with a conceptual based multidimensional framework, the determinants of Orthopaedic service Utilisation among young people aged 5-24 years old at University Teaching Hospital (UTH) and the St John Paul II Orthopaedic Mission Hospital in Lusaka, Zambia.

Conceptual framework

This study used a conceptual framework shown in figure 1. The adapted version had put “enabling resources and service related attributes” in place of “access to primary care” (Canizares, 2014) and added the rehabilitation component. The interpretation was also different and merged perspectives from other studies, especially done by McDonald in June 2007, in their study on care coordination. Firstly, the *client demographic and socioeconomic characteristics* in this research referred to the predetermining factors at the individual level as they relate to access and utilisation of Orthopaedic services. These attributes in the Individual environment which may not change and /or are difficult to change.

Secondly, *enabling resources and service related attributes* referred to those activities and/ or strategies falling outside the individual, especially as they relate to the systems or service level decision makers protocols, policies and other aspects of an organisational design and its networks.

Specific objectives

1. To determine the levels of orthopaedic services utilisation at the University Teaching Hospital and The St John Paul II Orthopaedic Mission hospital among young people aged 5-24 in Lusaka, Zambia.
2. To determine the influence of client social demographic characteristics, on the levels of utilisation of Orthopaedic services at the two hospitals, among young population aged 5-24 in Lusaka, Zambia.
3. To determine the extent to which selected service attributes affect utilisation of Orthopaedic services among young people 5-24 in Lusaka Zambia.
4. To explore clients’ perceptions regarding orthopaedic services for 5-24 population in Lusaka, Zambia.

Methods

An embedded mixed methods design was used to conduct a Hospital Based Cross Sectional study. The Dependent variable was binary (high/low), Level of orthopaedic service utilisation among 5–24 years old Population in Lusaka, Zambia. Independent Variables were client demographic and socioeconomic characteristics and service related characteristics. The site and setting was Lusaka, University Teaching

Hospital (UTH) and St John Paul II Orthopaedic Mission Hospital (SJPII). The study population included Orthopaedic service users between the ages of 5 to 24 years, their care givers and service providers. Other parts of the methodology were:-

Sample size calculation

A Cross Sectional Study, using proportion (Daniel, 2010).

$$n = \frac{z^2 pq}{d^2} \text{ Where, } n = \text{sample size}$$

z = Z score, 1.96 at 95 percent confidence Interval

p = 5 percent estimated proportion of a given population likely to use Orthopaedic services in Zambia

q=1-0.05

d= two sided/alpha, at 0.05

$$n = \frac{1.96^2 \times 0.05(1-0.05)}{0.05^2} \times \frac{3.8416 \times 0.05(0.95)}{0.0025} \times \frac{0.182476}{0.0025} = 72.9904 \times 2$$

= 145.9808 =146 for the two hospitals.

Then, taking into consideration non-response at 10 %,

Final n = (100/100-10) x 146 =162.

Sampling design and selection

Stratification of the sample was by Hospital, thus stratified random sampling was used to draw a sample of 162 children and young people (5-24) from the hospital registers. The samples to these two strata were allocated proportionately taking into account the number of patients in each of the hospitals with the final samples being 68 from SJP II and 94 from UTH. The sampling frame was the hospital orthopaedic registry for the respective hospitals. Purposive sampling was used for service providers and convenient sampling for ten parents and six young people.

Inclusion and Exclusion criteria

Inclusion criteria: Clients aged 5 years up to 24 years who were admitted on the wards, being treated at the hospitals, coming to the clinics for reviews and clients in the same age range who had appointments with the hospitals before. For service providers the inclusion criteria was those who were currently employed at the two institutions to provide Orthopaedic services. Caregivers included were persons directly involved in the care of the clients, guardians /parents.

Exclusion criteria: Those who were too ill to engage in conversation.

Data collection techniques and tools

Primary data was collected from the respondents and secondary data was obtained from hospital records like the orthopaedic registers and official reports. The data collection techniques and corresponding data collection tools included the following:

Quantitative component: A data extraction checklist containing the type of data to be collected especially as it related to the 162 clients was used. Some of these checklist items included the age and sex of clients, area or residence, treatment outcomes among others.

Self-administered questionnaires for service providers were employed. The advantage of using a self-administered questionnaire included the fact that members of staff were literate and could fill in the questionnaire on their own. Some of the aspects included service attributes such as staff availability, cost, referral systems, and guidelines, follow up among others.

Qualitative component: In the qualitative component, client's parents were interviewed using a semi-structured interview guide to permit face to face contact and provide an opportunity to explore topics in depth.

One Focus Group Discussion (FGD) was held with six, out of the planned 10 young clients aged 15 to 24 using a Focus Group Discussion Guide (FGD-Guide). The Focus group was meant to capitalize on group dynamics by group interaction in order to generate data and insights that were unlikely to emerge otherwise. The technique inherently allowed observation of group dynamics, discussion, and first hand insights into the respondents' behaviours among other subjective aspects. The focus group discussion was with clients who shared some characteristics relevant to the study.

Data management and storage

The interviewers ensured that information was correctly collected before completion of the interview. The researcher also later went through all the interview scripts before data entry in to an excel worksheet on a laptop that was kept in a safe place. The data was checked for accuracy and consistency.

Data analysis

Quantitative component

For the quantitative component, data analysis was conducted with regard to selected client socio demographic characteristics and service related factors. To be specific, data was entered into an excel worksheet and then exported to STATA version 14. Categorical variables were summarized with frequencies and percentages in each category. The outcome variable was categorized into two possible results namely high level of orthopaedic service utilisation and low level of orthopaedic service utilisation.

Chi square was used to determine the association of the utilisation orthopaedic of services with personal characteristics and appropriate service related characteristics. Fisher's exact test was used where observations were less than five. Then the final analysis utilized univariate logistic regression to get unadjusted estimates and investigator led multiple logistic regression to get adjusted estimates, at 95 percent confidence intervals with alpha at 0.05 (Tinabu, 2010).

Qualitative component

From the qualitative part, all open ended questions from the questionnaires, the semi structured interview guide and the focus group discussions were coded manually. The common themes from the discussions were deduced, coded and presented as part of thematic analysis. Both negative and positive perceptions of the participants especially how they rated their children and /or their health; the benefits and risks as a result of using the orthopaedic services and any other views the participants might have held were included. With regard to policies, content analysis was done.

Ethical considerations

Firstly, approval to conduct the study was sought from the University of Zambia Biomedical Research Ethics Committee, Reference number 054-06-17. Secondly, authority to conduct research was granted to the researcher by the Lusaka Provincial Health Office and the Lusaka District Health Office. Thirdly, permission to use the University Teaching Hospital Orthopaedic services data base and the St John Paul II Orthopaedic Mission Hospital data base were obtained from the respective facilities. Additionally, permission for storage of research was obtained from the National Research Authority.

Information was provided on the purpose of the research. Assent for participants under the age of eighteen was obtained from parents/guardians. Consent was sought for interviews and discussions from the participants themselves who were over the age of eighteen. Confidentiality and respect for participants were maintained. Names or personal identification during data collection were not used and data was analysed in aggregate. Furthermore, it was ensured that the proposed research methodology for

conducting the study was followed. This means that there was no alteration of the research findings aimed at satisfying the researcher's views.

Research Dissemination Plan

The findings of the research will be shared with the Institutions where the research was conducted through a meeting for dissemination of findings. An Oral and poster presentation was done during the graduate forum and publication of findings in a peer reviewed journal will be done. A copy of the report will also be submitted to the National Health Research authority and the University of Zambia.

Results

Descriptive results

Table 1
a: Description of sample by facility and level of Utilisation (n = 162)

Health facility	Level of Utilisation		Total	P value (Chi-square)
	Low f (%)	High f (%)		
University Teaching Hospital (UTH)	36 (22%)	32(19.5)%	68 (41.5%)	0.164
St. John Paul II Orthopaedic mission hospital	60 (37%)	34(21)%	94(58%)	
Total	96(59.3%)	66(40.7%)	162(100%)	

Table 1

b: Client Demographic, Socioeconomic Characteristics according to level of Orthopaedic Services utilisation (n = 162)

Characteristics	Level of Utilisation		Total	P value (Chi-square)
	Low f (%)	High f (%)		
Age group	43(26.5%)	24(14.8%)	67 (41.4%)	0.746
5-9	28(17.3%)	21(13.0%)	49 (30.3%)	
10-14	14 (8.6%)	12(7.4%)	26 (16.1%)	
15-19	11(6.8%)	9(5.6%)	20(12.4%)	
20-24	96 (59%)	66(41%)	162 (100%)	
Total				
Sex	62 (38%)	34 (21%)	96(59%)	0.096
Male	34 (21%)	32 (20%)	66(41%)	
Female	96 (59%)	66(41%)	162 (100%)	
Total				
Education (> 12 year)	22(13.6%)	11(6.8%)	33(20.4%)	Fisher's exact 0.274
Primary	15 (9.3%)	12(7.4%)	27(16.7%)	
Secondary	1(0.62%)	4 (2.5%)	5(3.1%)	
Tertiary	58(35.8%)	39(24.1%)	97(59.9%)	
N/A	96 (59%)	66(41%)	162 (100%)	
Total				
Mother's education (< 12 year)	47(29%)	25(15.4%)	72(44.4%)	Fisher's exact 0.411
Primary	5(3.09%)	2 (1.2%)	7 (4.3%)	
Secondary	3(1.85%)	2 (1.2%)	5 (3.09%)	
Tertiary	41(25%)	37 (23%)	78(48.1%)	
N/A	96(59%)	66 (41%)	162(100%)	
Total				
Occupation	17(10.5%)	15(9.3%)	32(19.8%)	0.430
Formal	79(48.8%)	51(31.5%)	130(80.3%)	
Informal	96(59%)	66(41%)	162(100%)	
Total				

Other descriptive statistics are as follows

Income

It can be noted that middle income earners made up 27.8 percent (45/165) of clients that had low level of orthopaedic services utilisation. Middle income earners were from families earning between K2, 600.00 to K3, 500.00 per month, while 20.4 percent had high levels of orthopaedic service utilisation and fell in the same earning brackets.

Area of Residence

With regard to the area of residence, most of the clients from high density residential urban areas around the country made up of 31.5 percent (51/162) were falling in the category of those with low levels of orthopaedic services utilisation. While the least number of clients was 5.6 percent (9/162) from rural areas around the country and had high level of orthopaedic service utilisation.

Health Insurance

The most common insurance type of health insurance was the ordinary medical insurance type that covered treatment expenses but not rehabilitation. Some of the providers included Madison Insurance, Sancare, and Prudential among others. The areas of health insurance cover were mostly clinical areas and not assistive devices. In terms of numbers, only 18.5 percent (30/162) had formal insurance.

Treatment Outcome/ Remark

At the time of the research, 34 percent of the young people (55/162) were treated and with better treatment outcomes in this study and were from the “low” category of users, compared to 3.1 percent (5/165) who had adverse treatment outcomes and were falling in the category of those with high level of orthopaedic service utilisation.

Social support

Various sources of support were noted, with family support being the main source of support, at 39.5 percent (64/162) as shown above. They types of support included support with activities of daily living, material, financial and spiritual / psychosocial support in some instances.

Level of Orthopaedic services Utilisation

Orthopaedic services are delivered in a multitier referral pyramid. Other facilities refer difficult cases to the national referral hospital, the UTH. The types of Orthopaedic services studied at the two institutions included the Prosthetic and Orthotic workshops, Physiotherapy department, Orthopaedic wards (C22 for the UTH) the outreach programme for St John Paul II and clinic 3 at UTH. The median number of hospital visits per person during the study year was 8.4 visits. From the 162 clients studied between the ages of 5-24 years from the two hospitals, 96(59 percent) had low levels of Orthopaedic service utilisation and 66(41 percent) had high levels of orthopaedic service utilisation during the study year.

When chi square test of association was done, this study found an association between level of use and type of Orthopaedic service. This was significant by type, Pearson chi² (4) =12, with the associated p-value of 0.02. Additionally, univariate and multiple logistic regression was done to test the strength of the association. The results of the logistic regression model are tabulated below:

Table 2

a: * Model 2 Univariate and Multiple Logistic Regression (n = 162)

Service type	Unadjusted OR (95% CI)		P Value	Adjusted OR (95% CI)		P Value
Orthotic/Prosthetic workshop	Ref			Ref		
Physiotherapy	0.32	(0.11,0.94)	0.04	0.16	(0.05,0.59)	0.01
Wards	1.7	(0.63, 4.9)	0.28	0.75	(0.19, 2.9)	0.67
Outreach	1.4	(0.47, 4.5)	0.5	0.69	(0.13, 3.8)	0.68
Clinic 3	0.6	(0.25, 1.4)	0.26	0.33	(0.09, 1.3)	0.11
*Part of the overall final model.						

The results of the Multiple Logistic regression also show that after adjusting for all the other variables in the final model the clients from the physiotherapy department were significantly 84 percent [AOR 0.16; 95% CI 0.05, 0.59] less likely to use the Orthopaedic services compared to the clients from the orthotics and Orthopaedic workshops during the study year with the associated p value of 0.01. With regard to the findings on examination of patients by the service providers, most musculoskeletal conditions, 48/162 (30 percent) among the study population were fractures (unspecified); fractures of upper extremities due to falls among those below 19 years 14/162 (8.6 percent) and due to Road Traffic Accidents were 9/162(5.6 percent) among those above 19 years in various sites. Cerebral palsy at 24/162(15 percent) conditions were also among the top four contributing factors towards musculoskeletal conditions among the primary target.

Figure 2 shows the other types of musculoskeletal conditions and/or disorders that the children and young people aged 5 to 24 presented with, at the UTH and the St John Paul II during the study year.

Client demographic, socioeconomic characteristic and orthopaedic services utilisation

The following Table 2 shows the final model in the study. The results show that determinants of orthopaedic services utilisation include Area of residence, where clients aged 5–24 living in low density residential areas were 86 percent times significantly less likely to use Orthopaedic services compared to those in high density residential areas [AOR 0.14; 95% CI 0.05, 0.43; P < 0.0001]. Participants without Insurance were 83percent less likely to use Orthopaedic services compared to those with Insurance [AOR 0.17; 95% CI 0.05, 0.55; P = 0.003].

Table 2
b: Final model of the multiple logistic regression

Client demographic and socioeconomic characteristics	Unadjusted OR (95% CI)		P Value	Adjusted OR (95% CI)		P Value
Age Group						
5–9 years	Ref			Ref		
10–14 years	1.34	(0.63,2.86)	0.44	1.12	(0.46,2.72)	0.8
15–19 years	1.54	(0.61,3.85)	0.36	1.15	(0.37,3.50)	0.81
20–24 years	1.47	(0.53,4.04)	0.46	1.15	(0.33,3.95)	0.83
Sex						
Male	Ref			Ref		
Female	1.72	(0.91,3.25)	0.1	1.3	(0.61,2.85)	0.5
Area of Residence						
High density Urban	Ref			Ref		
Low Density Urban	0.36	(0.16,0.79)	0.01	0.14	(0.05,0.43)	< 0.0001
Rural	0.91	(0.34,2.39)	0.84	0.58	(0.17,1.95)	0.38
Health Insurance						
Have Health Insurance	Ref			ref		
Does not have Health Insurance	0.63	(0.28,1.40)	0.26	0.17	(0.05,0.55)	0.003

Enabling resources, service related factors and Orthopaedic services utilisation

The variables included availability of human resources, a review of policies and guidelines; referral systems, client follow-ups and other features that might affect the effectiveness and efficiency of services. The study looked at service related attributes in order to determine whether they were barriers or facilitators to effective Orthopaedic service use.

Availability of human resources

The study established that there is a shortage of human resource for orthopedic service provision to young persons aged 5 to 24 years in Lusaka, Zambia. The crude human resources to catchment

population ratio currently uses the entire population of Zambia on account of UTH being the largest National Referral Hospital.

Table 3
Specific tasks health workers carry out

HUMAN RESOURCE	St. John Paul II	UTH
Orthopaedic Surgeons	Conduct surgical corrections Prescribe Orthotics Part of the outreach team	Clinical work Advocacy
Prosthetists/Orthotists Technicians	Provision of assistive devices	Provision of Assistive devices
Nurses	Nursing care	Removing sutures
Physiotherapists/Physiotherapy technologists	Plan; assess, treat, prevent and advise	-
Medical social workers	-	Help pay medical fees Procure rehabilitation aids

Policies related to Orthopaedic services utilisation

Some of the policies which the service providers said to have been guiding Orthopaedic service provision included World Health Organization Guidelines (2005), the vision 2030, the National Health policy and the National Health Strategic plan. A summary of the content analysis is tabulated below.

The other policies mentioned by the service providers included the National obstetric and surgical guidelines and the physiotherapy guidelines. The checking shows that the domain is covered in the policy

DOMAIN	POLICY	WHO GUIDE-LINES	VISION 2030	NATIONAL HEALTH POLICY	NATIONAL HEALTH STRATEGIC PLAN
Service delivery	Improving access to Orthopaedic services	• •	-	Generally, p35 and rehab.	•
Health Workforce	Training, Retention and Promotion	•	-	•	•
Information	IEC Strategic Information	-		Strengthen awareness	•
Medical Products/ Technologies	Regulation Treatment Protocols	•	-	Essential meds	•
Financing	Priority setting Financing sources sustainability	•	•	• Ppp P45	•
Leadership and Governance	Politics Power stakeholders	-	•	•	•

Table 4

Content analysis of Orthopaedic Policies/Policy instruments

Applying the 2005 WHO guidelines to the Zambian scenario

Having found that inadequate human resources for orthopaedic services was very evident, we went further to try to establish how many people needed to be trained, especially in the prosthetic and orthotic area. Calculations using the guidelines, the total number of human resources required for provision of orthotic and prosthetic devices is 512. Out of these, 98 must be category I and II (Professionals with at least three years training) and 414 should be trained as category III (Technicians and/or bench workers).

Calculation of the number of people requiring devices		
Total number	$15,900,000 \times 0.5 / 100 =$	79,500
Number of devices per year	$79500 / 3 =$	26,500
District (10)	$26,500 \times 0.8 =$	21,200
Provincial (2)	$21,200 \times 0.2 =$	4,240
National (1)	$4,240 \times 0.3 =$	1,272
Number of category I and II required		
District (10)	$(21,200 / 300) \times 10 =$	71
Provincial (2)	$(4,240 / 250) \times 2 =$	17
National (1)	$(1,272 / 125) \times 1 =$	10
Number of category III		
District (10)	$(7 \times 5) \times 10 =$	350
Provincial (2)	$(9 \times 3) \times 2 =$	54
National (1)	$(10 \times 1) \times 1 =$	10
Total required		512
*Calculations taken to the nearest whole numbers, using the 2005 guidelines		

Perceptions and experiences of clients

Clients' perceptions, both positive and negative responses and experiences regarding orthopaedic services were explored. The findings from the focus group discussions and in-depth interviews are presented here, in no order of priority. They are a reflection of the opinions of the participants in the study as they shared their lived experiences. Eight themes emerged from the in-depth interviews and focus group discussions: knowledge and adaptation to msds; parental difficulties in understanding MSDs; perceptions on service providers' skills; experiences at other health facilities; importance of seeking expert advice; self-rated health; benefits and risks.

Knowledge and adaptation to MSDs/condition

Young people in the focus group discussion perceived knowledge about their condition to be an important aspect so that they did not have to go to the hospital for everything and could do things on their own. When asked whether they knew anything about their condition, most of the young people in the focus group discussion said yes. Only 1/6 knew their condition by its scientific name though, a double

amputee as a result of gangrene.5/6 also shared about how they knew about their condition: Two were born that way and their parents told them that were different; one had surgery as a child while another had one leg shorter than the other; yet another participant was involved in a road traffic accident at 16 years of age.

Parents face difficulties in understanding their child's condition

Parents' perception of the deficiency in expert knowledge given on conditions made it difficult for them to fully comprehend their child's condition. Six out of 10 parents in the study did not understand the nature of their child's musculoskeletal condition. The causes of certain congenital conditions like clubfoot/ talipes were unknown and, therefore, difficult for orthopaedic service providers to explain to parents, they expected the doctors to have all the answers. This can be noted from the following responses given by the parents who participated the in-depth interviews. KK is a 28-year-old mother who has gone up to grade 10. She has a male child aged 2 years 3 weeks. They had so far come eight times to attend clinic three for correction of talipes at the UTH.

"I do not understand the nature of illness because even the Doctors have no idea of the cause of illness. I have seen a lot of Doctors who have not managed to convince me of the baby's condition. I tried to enquire from a senior Doctor who told me that the cause of a child being born with bent feet is not known". IDI/P1/C3BM is a 29-year-old father who was interviewed as he escorted a mentally unstable wife to the Friday clinic at UTH. They brought a 1-week 5 day- old male child with congenital talipes.

"The doctors have been able to explain the condition of the child to us although up to this moment we have not clearly understood why the child was born with bent feet [Talipes]". IDI/P3/C3

Inadequate skilled staff and long waiting hours

Most of the parents were of the view that there were not enough qualified orthopaedic /health workers and the waiting time was too long. Some parents expressed reduced tolerance for trainees to attend to their children. This can be shown from the parents' responses. For instance LG, a 35 year old mother who had visited the UTH for the second time with her nine year old son observed:

"My son broke his arm after falling from a tree while playing at home. The child came in for reapplication of POP.... A student doctor did not correctly apply the first POP and he could not move his fingers and swelling started which prompted them to remove it.... I was told to enter into the consultation room after I shouted at them". IDI/P2/C3

"We spend more time waiting in line, but when the doctors come, they do not really take long to see us even if they seem to be fewer than the number of people sitting, waiting for them." IDI/ P4/C3

Bad Experiences at other facilities

Parents were also asked to share on their experiences at other facilities. Most parents were of the view that there was a lot to be desired at other health facilities. This was corroborated by service providers who said that some clients from urban areas are mostly not satisfied with services at UTH while the rural clients are satisfied with the UTH. At other times, clients are not happy with services in other district health facilities. To highlight this, one of the parents from district "M" who came to the St John Paul II orthopaedic mission hospital had bad experiences at other facilities:

"My nine year old son "C" stays with us in (Name withheld). He fell from a tree in April and broke his Arm [sustained fracture of the humerus and dislocation of the elbow]. He was taken to the Clinic where he was treated and a POP was put on his arm for a month. But when a month later we went to the clinic to remove the POP, his arm was not looking good and he could not use it like before. We were referred to Cheshire homes where the sisters brought our child here". IDI/P6/SJPII

Importance of seeking expert advice- Health officers in Outreach initiatives helped parents to decide where to take their child

With the nature of targeted interventions at the St John Paul II, the parents were helped by the outreach workers to decide where to take their child for treatment. For instance an Aunty who had visited the St John Paul II with her teenage niece shared her story: *"Professor (Name withheld) had followed the child all the way to Mongu. I felt they just had to make sure the child was brought in. I also wanted to make sure that I helped my sister so that when her child grows, she will not blame us for not having done something about making the decision to amputate her badly formed leg ... you see, we had options and the advice from someone who had a lot of experience..."IDI/P7/SJPII*

Some of the respondents attending the hospital clinics were often referred from the lower level clinics and said they had no choice of hospital. Most of the parents said that they had been referred to the UTH and did not know any other place where they could be attended to for free.

"My Child was born at UTH, so the initial assessment done there, we had to come back from Mbala..." IDI/P4/UTH O

Young people on motivation to seek orthopaedic services

When asked what do they thought motivates people to go to the hospital, most of the young people felt that they managed to get to the hospital because of the nuns- for the two girls from Da Gama; because his boss knew good doctors from UTH and the SJP II Hospital and another because of a follow up by a professor from the St John Paul II hospital.

Good Self-rating of health enhanced experiences at health facility

Self-rating of health was defined as the way participants felt about their state of health. In this study, the views of the parents acted as proxy. For this aspect, parents of the children were asked to rate the health of their children. Most of the parents indicated that their child's health was good due to the fact that they were mostly outpatient clients- not hospitalised. What was also interesting was that in judging their children to be well, parents would compare their child to other children they saw and /or met at the hospital. Good self-rated health after reviews implied satisfaction with the service and made it possible for parents to not only accept their child but return for other appointments and get involved in improving the functional abilities of a child with MSD.

"At least my child is better than some of the children I see here. I make sure I bath her before we come. I have also trained her to use the toilet in the morning..." IDI/P4/UTH O

"My girl is a happy child. She is very fond of her Dad. Those two are best friends. She has a baby brother now ..." IDI/P8/SJPII O

The young people in the focus group discussion also rated their health as better than before. Thanked nuns for always being there for them. They noted that their lives had improved greatly. Only one client rated themselves poorly, one young man was still mourning the loss of his limbs after amputation. He thanked his brothers from the mosque who helped him to cover hospital expenses such as these. He noted that his boss was very supportive as he had to undergo amputation twice (one on each leg, three years apart, first at UTH now at St John Paul II).

"...I feel shy to go outside because I used to walk normally but now I have to use a wheelchair, so I stay indoors most of the time....I am recovering slowly. Now that I have seen that others use two of these [prosthetic limbs] I can learn to walk again, I would like to use crutches" FGD/

Service provider's views on how patients perceived themselves health wise was that children easily adapt to their condition.

Benefits of coming to the hospital

Benefits of coming to the hospital were defined as improved outcomes as a result of orthopaedic service utilisation. When asked what the participants felt or thought had been a good change in their situation as a result of using orthopaedic services , the responses emerged around the following themes:-**Increased knowledge /educated**

"My husband and I were educated on the condition of the child and were advised to bring him to UTH" IDI/P1/C3

Healing progress/ Weight loss

"I think coming for Physio has been very good for her. She has lost some weight and is not so stiff like before" IDI/P4/UTH O

Child able to do things for self/ less burden

"Assistive devices given, my child now is able to play, go to school and move around like any other child" IDI/P7/SJPII

Some **parents did not see any benefits yet** there were some negative views from parents in the in-depth interviews with regard to benefits of using orthopaedic services at the hospitals. While some were hopeful that a change would eventually ensure, others were not. Specific quotes are shown below:

"I have not seen any benefit yet, we have just started coming, been told that and we believe in God that eventually our child will improve" IDI/P3/C3
"Not seen any benefit yet, sometimes I don't feel like coming but my husband insists that we come. What can I do, he is the head of the house and he gives us transport" IDI/P9/SJPII

"Benefits can only be seen if they put the right people in place, including those at the records section". IDI/P2/C3

Young people on benefits of using Orthopaedic services

Responses included that the situation was bad before. Regarding what had changed, responses included being fitted with prosthetic limbs and being able to move about. One participant admitted that he now wanted crutches because at least with those, he will be able to move around more easily in the compound and do things. In this way, not be very dependent on others to take them wherever they wanted to go.

Risks

Risks in this study were defined as what the participant felt had been a bad change as a result of using orthopaedic services. As conversations with the parents unfolded, it was discovered that the risks perceived were broader than this, to include other social cultural dynamics. Thus, risks were unbundled and the following themes arose:-

Seeking traditional healer/ doctor services as a result of being uncertain about conventional orthopaedic care Uncertainties in results of conventional treatment were included in that some parents suspended their own public beliefs (Christianity) and other knowledge systems and took risks to ensure that their children received some form of care. Consultations with the traditional doctor and /or "prophet" were made when their child had severe musculoskeletal disorders in order to "neutralise" the situation in addition to coming to visit orthopaedic services at the hospital.

"Mmm... Madame, we are all Christians not so? And it is good to tell the truth. Can one just sit and watch? When things are difficult, one tries to consult other people with more knowledge and use indigenous medicine ..." IDI/P2/C3

Fear of marital discord

Sometimes ladies do not often comply with the number of appointments given and rarely discuss emotionally loaded, painful topics with their husbands about their children's condition and upkeep.

"Sometimes transport is a challenge and my husband is just a security guard. He gives us money to get on a bus to come but I wish he could give us money for a taxi... but you know how it is, he will be suspicious Besides, my child is gaining weight and as you can see I have to carry him on my back all the way to the hospital..." IDI/P9/SJPII

Review days are too close / no option for parents

Some parents also felt that there was a negative change in the way their day to day activities were scheduled and that they had no options. This was to accommodate taking children for reviews on days that were too close. *"They give days which are convenient for them so even if I know I will not be able to come, I just agree to that since I do not want them to know think that I am not serious about my child getting better."* IDI/P3/C3

Broken family relations

Broken family relations was what some participant felt had been a bad change. This was not directly related to the use of the service though but as a result of the husband being ashamed of being associated with a lady who had a child with cerebral Palsy frequenting the hospital. *"We were happily married. Our daughter was born at UTH and we went to live in another district. He was there when we did the initial tests when the child was six months but later he started coming home late, and slowly withdrew his support. I had to come back to Lusaka and have been looking after my daughter all by myself since then."* IDI/P4/UTH O

Stigma in some instances shifts from the child to the care giver

Parents noted that there were instances where they had to live with the negative views of the community regarding the "real" reason for frequenting the hospitals with their children with MSDs. It was observed that the stigma attached to chronic illnesses shifted from the child to the care giver. *"Sometimes coming more often for review seems to the neighbours like I am hiding something-big, I may be HIV positive and I come to get ARVs but pretend to bring the child to the hospital for reviews."* IDI/P1/C3

Focus group discussion –other views

When asked what issues they would have liked to address in order to make Orthopaedic services better, generally, the focus group discussion participants who had used orthopaedic services from SJP II were happy with the place. They said “all the other places look good”, however, the workshop could have had white cleaner floors and cleaner sinks and bright curtains in the windows because children also come there. It was observed that the hospital gymnasium adjustment to the work shop was quite plain, while two children happily practiced how to walk.

When asked about being given a chance to design a programme on Services for children and young people with mobility challenges and what they would add, two ladies said water for drinking while they waited for repairs. The young people were also concerned about what they would become in future. One lady asked if she could be accepted in nursing school as she had one leg which was shorter than the other.

Discussion

The results of the study indicate that of the 162 clients studied, the proportion that had low level of orthopaedic use was 59 percent while the other proportion for high use was 41 percent and this difference was not statistically significant.

The proportions cited in this study are higher than those reported in Canadian Studies in Canizares (2014), where hospital visits were at 10 percent. The proportions found in our study are comparable to other studies regarding revisits especially to the emergency visits for MSDs because of the need to address recurrent orthopaedic care needs, even though they were not dichotomised (Dy, 2015).

Besides, high use must have been evident in this hospital based survey due to the fact that some Musculoskeletal Disorders tend to take longer than others to resolve. Depending on the sight of injury, the disease, the type of bones, muscles, tendons and /or ligaments affected, patients may stay longer in hospital and might need to come more often than others for review (ibid). In addition, the ability of the client to get better due to their level of immunity and the nutritional status of the client, could also have a bearing on the likelihood of being high users and this needs to be explored in the future.

Notwithstanding the above, this study is still relevant to the attempts to project MSDs in the public health realm in developing countries in that it has established that access to and utilisation of orthopaedic services is a national challenge and also a global one. It affects both the developed and the developing countries, even a lower middle income country like Zambia.

The level of use was significant by service type: In particular, the final model demonstrates that physiotherapy clients were 84 percent less likely to use orthopaedic services compared to clients from the orthotic and prosthetic workshops and this difference was statistically significant with a p- value of 0.01. This implies that, while certain MSDs are acute and require immediate attention regardless of options,

other conditions are chronic and more appointments are made to ensure that the healing process takes place, as it is with conditions requiring physiotherapy. With the chronicity of conditions, mostly addressed in physiotherapy sessions, there is also a tendency of clients to miss sessions and only resurface when in great pain. Additionally, decisions are made by the caregivers and or guardians of the children and young people, who were the primary target group. The parents had transport challenges in most instances and most of the children and young were dependents who could do little in terms of contributions to their own care. This means that there is need to address retention in care for the management of chronic conditions. That levels of use for physiotherapy clients can be enhanced if the orthopaedic needs of clients and the services provided are matched.

Fractures, falls – falling from mango trees, Road traffic accident victims, cerebral palsy; congenital anomalies and amputations were among the top conditions in the study. These findings are similar to other studies, although there could be slight seasonal variations for children falling from trees (Park, 2015).

Client demographic and social characteristics have a bearing on health service utilisation in general as observed in other studies (CSO, 2014). In our study, the variables in the final model included age, sex, area of residence and Health Insurance. Unlike Clinchi's study in 2009, age and sex were not significant determinants of orthopaedic services utilisation among young people in Lusaka, Zambia. In other words, there was no evidence of an association / relationship between levels of orthopaedic services utilisation and age, as well as no sufficient evidence of an association between levels of orthopaedic service utilisation and sex and age in this study. Nonetheless, it is worth noting that as age increased within the age groups, Orthopaedic service utilisation tended to also slightly increase in absolute figures. Our finding could mean that MSDs are varied, usually affect people of all ages, including children and young people, similar to the worldwide situation as observed by the World Health Organisation in 2017. However, for the Zambian case, this can only be ascertained in a large scale nationwide survey with all age groups including those above 24. This finding is still important due to the fact that Zambia has a youthful structure. With Zambia having a youthful population structure, the assumption is that this could also be a reflection of the fact that large populations of young people are likely to contribute to high morbidity levels as captured by the Ministry of Health in the D 70 indicator of diseases (MOH guide on quality assurance) and the trend in incidence from 2011 to 2015 noted in the National Health Strategic Plan of 2017 to 2021. Future demographic surveys should have indicators on common MSDs among the non-communicable diseases to ascertain the population level gaps if any.

With regard to the relationship between sex of a client and level of utilisation of Orthopaedic services, it means that where access to and utilisation of orthopaedic services is concerned in a hospital setting, there was no discrimination on the basis of sex for the particular age categories studied. This finding is contrary to other studies like that of Seidenberg et al (2014) which showed a significant relationship between sex and the utilisation of hospital resources.

This study established that there is an association between the area of residence and level of utilisation of orthopaedic services, in particular that this difference [OR 0.14, $P < 0.0001$] in the utilisation of orthopaedic services implies that MSDs are of public health importance: in that the majority of the population tends to be young and live in resources constrained environments in high density areas. While their counterparts in low residential areas use orthopaedic services less, they tend to use them more (Wyss, 1999). This finding is consistent with findings in other studies that note that residents in high density residential areas, peri-urban, experience high levels of morbidity due to preventable diseases but do not have specialised health care in their communities and tend to go to a central one, as a result of poor urban regional planning (DESA, 2013). This could be a reflection of the fact that health centres which are close to where people live do not offer specialised services like orthopaedic services. Simple tasks like suture removal and change of POP, are among the cases handled at the referral hospital instead of being seen at local facilities. In most instances, the residents in low density areas tend to be from families that can afford private care for orthopaedic conditions at home and abroad, hence a wider choice. In some instances, health officers are engaged to provide care at home in low density residential settings.

This has implications of policy, to ensure that at least first level hospitals should have some form of quality basic Orthopaedic care and attain the idea of bringing quality health services as close to the community as possible. Notwithstanding the above, this finding is also an indication that the targeted interventions are working, that there is preferential option for the poor and vulnerable members of the community to access quality orthopaedic services, albeit far from their homes.

This study established that Health Insurance was a determinant of orthopaedic services utilisation, similar to studies on Household Health expenditure Surveys noted in the literature review section, and assertions by Fletcher, (2016). Clients without health insurance were 83 percent less likely to use orthopaedic services compared to those with Insurance and this difference was statistically different at $p = 0.003$. Health insurance is important in access to and utilisation of specialised services. Although the children and young people themselves in some instances were not required to pay (St JP II, 2016) the resources mobilised and donated by the various NGOs and groups inherently acted as facilitators of orthopaedic services utilisation but these can only cover a few. Given that few are actually insured, this form of Social Protection can act as an insurance system thereby reduce population health risk and its effects (Hangoma, 2017). It is hoped that future studies can also be done on the effect of current social protection measures in place with the support of cooperating partners, on increasing access to and utilisation of orthopaedic services and /or improving the quality of life in the country. It is worth noting that insurance claims did not cover all the orthopaedic services, i.e. devices, offered in the continuum of care even through there was differential levels in utilisation between those with insurance and those without insurance .

Enabling resources and orthopaedic service related attributes

This study has established that human resources for orthopaedic service provision for the target group in this study was scarce. While demographic and epidemiological transitions are driving changes in population based health threats like high incidences of Musculoskeletal disorders, around 67 per 100 as highlighted in the strategic plan of the Ministry of health in Zambia (2017–2021), there are still limitations in the human resources pillar. These findings are similar to (Derbew, 2016 and Sampa, 2017) above. This in turn is a great barrier in responding to the MSDs threat. For both institutions and indeed for the county as a whole, there are widespread shortages, especially for Orthopaedic technologists. Although for the individual hospitals there are better doctor to client ratios at the St John Paul II compared to the UTH, the overall the human resource to population ratios are abnormally high in the study site as a whole. This brings into question whether the quality of services offered are of world class standard and can reduce medical evacuations outside the country. More studies are needed in this area.

The position of this paper is that health policy on human resources for health must take into account World Health Organisation guidelines to reduce the denominator to figures less than the national population i.e. from 15,900,000 to about 80,000 for those requiring assistive orthopaedic devices and from 15,900,000 to about 800,000 for general health services as cited in the National Health Strategic Plan 2017–2021, for a third level hospital.

Although there is evidence that something is being done about addressing the human resource challenges through the enhancement of Public/ private partnerships such as training programme at the University of Zambia in Collaboration with Ottobok; training of staff in trauma by the Israelis and having surgeons as fellows under different programmes, it will take a number of years before the actual fruits can be seen. Careful, Incremental implementation of programmes and government commitment is required to address service delivery for better outcomes in orthopaedic care. All things being equal, the advantage is that a step has been taken in the right direction to put in measures that will help to address the shortages.

Referral systems

Referral systems in the context of orthopaedic service provision ought to be well defined. There is a general assumption that due to the nature of the cases handled, only orthopaedic technocrats should be involved as can be deduced that most referrals are just within health sector: On one hand, this can help orthopaedic service providers to mingle with like-minded staff and explore niches to scale up capacity building in orthopaedic care at local levels (Bruce, 2017) using WHO and other relevant guidelines. On the other hand, this, can be construed to mean that there is some level of disregard of the fact that clients are social beings in nature, with a pleural of needs that cannot be meet by one sector. Social Welfare department, faith based groups, the private sector and others need to be engaged so that diverse welfare, financial, psychological and training needs are met.

Like it has been done in other sectors, overall, there is need to undertake bottleneck analysis, do mapping and identify gaps in services delivery and referral systems. This should be between communities and

service providers for (state and non-state) for MSDs continuum of support and human rights protection if need be. Ideal terms of reference can be drawn in such a way that clients even in resources constrained settings, can get an adequate standard of orthopaedic care with dignity from many players in networks.

Client follow up

This study has established that loss to follow up is a barrier in achieving sustained positive outcomes for patients in Orthopaedic services. This, ultimately, negatively affect optimal service utilisation if others in the community do not see good results. Given the fact that hospitals are always resource constrained, mechanisms for client follow up from the referral hospitals is periodic and tended in the past to be centred on non-state actors' initiatives such as FLYSPEC activities cited in Makasa et al (2010) for the UTH. While follow ups for clients within some areas of Lusaka are done on specified days at the St. John Paul II. With a total surface area of 752,612 square kilometres and a population of 15,900,000 million people (2016 CSO projection), some areas are very sparsely populated in Zambia. In addition to topographic characteristics of some areas, this is a challenge in reaching the unreached through outreach services. However, this challenge can to some extent be surmounted if linkages to primary health care facilities which tend to be closer to communities are made. These could be equipped to handle some post-operative care among other issues.

Gaps in Monitoring

There is a gap in defining and gaining consensus on key MSDs indicators to measure success /results, and this gap was very evident for the UTH similar to findings in other studies(Seidenberg, 2014) .Each orthopaedic centre has its own registers and report format. Except for the orthopaedic workshops, data collected on clients is quite varied. In future, the commitment to monitor and measure results will assist in knowing where they are and /or will be. While it is well appreciated that there are many MSDs, as earlier noted, tracking changes in the population served should not be compromised by the absence of specific deliverables. Reports should be submitted to the information office on agreed times.

Cost

With regard to cost, it was established that for clients aged 5–18 under the study, orthopaedic services were offered free of charge at the SJPII orthopaedic mission hospital. The service providers said that the cost of service per person was sometimes between K1, 500.00-K3, 500.00 and that it depended on the condition of the patient. When surgical procedures were done, the cost ranged from K15, 000.00 to K18, 000.00. The amounts involved might sound reasonable if one is to obtain world class quality orthopaedic services. Although there was no proof of an association between the level of use and the cost of the service and or income in the quantitative analysis, it can be deduced that clients whose incomes are way below these brackets who are not targeted with support to assess the services do not actually use them.

Qualitative studies show that the poor are unable to access, ultimately use health care services and rehabilitation ((Matt, 2014)- one of the services in the continuum of orthopaedic care.

Besides, if on average it costs about K9, 655.00 per person to bring about better treatment outcomes for the young people, the idea of rigid government grant can be said to be not very helpful in attaining quality services at the UTH where out of pocket expenditure is incurred, even in the context of free services.

This is also an indication that there is out of pocket expenditure as a result of trying to access orthopaedic services. This finding is consistent with research on household health expenditure surveys conducted in Mauritius, Kenya and Zambia noted in the literature review section. While it is appreciated that in a free market economy there is limited government intervention and other actors come in, health is a public good needed in society whether profitable or not.

Despite not being able to establish all the cost centres in the area of study, the importance of this research is that it established the existence of resource gaps faced by the hospitals in their quest to provide orthopaedic services. This in turn mirrors the fact that there are a lot of unmet needs in this sector. There is, therefore, need for greater collaboration between and among government and partners in building sustainable financing mechanisms. Investments in addressing MSDs must reflect the policy recognition that the conditions are among the top ten causes of morbidity. Adequate financing will go a long way in addressing the unmet needs and avoid late presentation and eventually, improve the health of young people who will later become productive members of society.

Perceptions and experiences of the participants

Parents in the study had difficulties in understanding the nature of their children's condition. This can be due to the fact that there are many theories surrounding the occurrence of musculoskeletal disorders, similar to difficulties highlighted in a study on early outcomes of Ponseti management of talipes (Sonkwe, 2009). Understanding of the situation can greatly help one to adopt health seeking behaviour.

What is interesting in this study is that despite little understanding, the parents still brought their children to the hospital for reviews, exercise and other relevant orthopaedic services. This can be explained using the incentives theory. That parents may not yet see the benefits but they are happy, intrinsically rewarded, to be doing something to help their children on the road to wellness. In terms of health care, this is important in that it builds ones' esteem and is intrinsically rewarding to the care giver as they have the knowledge about what they can do to help (Park, 2015).

It is good to note additionally that, the education done by health care workers on how to care for their children increases their skills and/or mastery over a previously difficult situation and is a form of extrinsic reward. This finding is similar to other studies where this was done (Pietrucin-Materek et al, 2015). Parental education is important in the success of treatment process. Parent information hand-outs can be prepared and other innovative ways to reduce the stress that comes with parenting children with short

term and /or long term orthopaedic conditions. Young people are well informed and understand their situation, as noted in the FGD above, except in one instance. In spite the hospitals having already put in some measures to improve access to Orthopaedic services like outreach services and free services, the feedback in the FGD and parent interviews that the cost of the services and materials are high, including transport challenges, is a matter of concern and could have a negative impact on client satisfaction and acceptability of orthopaedic services.

Although there could have been a difference in the clinical diagnosis, of their child, it was good to note that most parents rated their children as being good, in fact better than the other children they saw. This means that it is important to have exposure to the environment around one and a possible practice measure is to have parent groups in order to educate them in their free time, on care for the children at home. Sometimes, even if they are willing to continue with simple exercise or look out for something unusual at home, they are more likely to try out what their peers are doing. Most of the key barriers associated with the women folk included little or no information about practices and other essential health actions; cultural beliefs; distance to health facility and costs of transport and fear of marital discord if they discussed health matters at length with their husbands and broken families were noted. Similar to other studies, parenting of children with chronic conditions comes with stress (Pietrucin-Materek et al, 2015).

Fathers' support was reported in the study, under family support. Knowing that parent education was done and in other instances fathers also accompanied mothers to the hospital, this is a sign that the service providers are moving towards enablement, an important quality measure and also a way of reducing the burden of care on the women folk.

On the other hand, some of the parents had not seen any difference/benefits of using Orthopaedic services yet. This is alright too, as new entrants really are not be expected to see the results immediately while others may not be able to take note of the signs since they may be preoccupied with other care needs. Others may have experienced adverse effects, like mal unions and non-union following a fracture, especially in the case of a child that had severe osteoporosis. Here gaps exists on possibility of other conditions alongside musculoskeletal disorders.

Study limitations

Proportion for utilisation used to calculate the sample size was an average estimation based on WHO estimation of Orthopaedic appliances utilisation, the proportion of people likely to have impairments and the reported use in the developed countries of 5 percent to 15 percent. The 5 percentage point was used due to the varied nature of MSD which are categorized differently and in most instances might require use of walking aids and other appliances for considerable amounts of time. Clients from Hospitals might have more need to use the hospital as compared to the general population, however choosing a referral hospital was deemed to have better chances of giving a more general picture of utilisation since clients come from diverse parts of the country.

Purposive sampling decreases the generalisation of findings in the qualitative component. The data and responses for the study reflect the opinions and views of the institutions involved in the study, thus the researcher endeavored to presents the participant's views in verbatim. Some records and or registers were incomplete. To avoid many missing values, restriction on the number of variables obtained was observed and the researcher relied on the electronic data bases created at the two hospitals and only in exceptional circumstances were hard copies referred to with the assistance of records clerks and nurses from the ward with whom the data requirements were shared during the study time.

Conclusions And Recommendations

Conclusion

In this cross sectional study, it was established that about four in ten of Orthopaedic Service users had high level of service utilisation while about six in ten had low levels of service utilisation. Determinants of Orthopaedic service utilisation among young people include service type, where clients from the physiotherapy department were 84 percent times less likely to use the Orthopaedic services compared to the clients from the orthotics and Orthopaedic workshops during the study year.

Additionally, the clients aged 5-24 living in low density residential areas were significantly 86 percent less likely to use orthopaedic services compared to those in high density residential areas. Those without Insurance were significantly 83 percent less likely to use Orthopaedic services compared to those with Insurance. Inadequate financial and human resources are major barriers to the attainment of sustained, quality orthopaedic. There are referrals /consultations within the hospitals. However, there is little or no Coordination in form of a referral network.

Most parents did not understand the cause of their child's MSDs and a few were hopeful that better outcomes would ensue. Key barriers cited by most mothers included lack of information about practices and other essential health actions to manage MSDs at home; cultural beliefs; distance to health facility and costs of transport and fear of marital discord if they discussed matters at length with their husbands.

Recommendations

Recommendations for policy: To tackle issues of financing for the institutions, the government, through the Ministry of finance must endeavour to increase budgetary allocation to the health sector to percentages closer to the 15 percent of the Abuja requirement in order to achieve universal health coverage alongside other measures. More innovative ways should be utilised including public private partnerships for maintenance and timely replacement of damaged health infrastructure and technological equipment in order to cover a wider array of musculoskeletal conditions thereby avert negative impacts.

The supply of Human resources for health, with regard to orthopedics must be adequately tackled and incentives put in place by government to avoid brain drain and burn out due to the unrealistic human resources to client ratios currently prevailing for all cadres.

With regard to education, the introduction of the Ottobok –University collaboration is a good intervention that must be supported by clear budgetary commitments to ensure adequate teaching and learning at this level and ensure that 512 specialists to be trained and/or be in training by 2030.

Recommendations for Practice: The St John Paul II and the UTH Orthopaedic service practice for 5-24 year olds should encompass more client/ Parent education around MSDs and related topics in order to increase knowledge about care and also reduce the key barriers cited. Secondly, the two health facilities require more collaboration and networking beyond health services to help clients with logistical problems to return for review, attain reduction in severity of MSDs and in particular instances , reduce age at presentation. Thereby, achieve better outcomes of treatment as well as prevent other related MSDs/ conditions from setting in.

Thirdly, in view of the fact that children and young people from the high residential areas significantly use orthopaedic services offered in Lusaka at UTH and the St John Paul II orthopaedic mission Hospital, the government should continue with the implementation of decentralization of basic health services, in harmony with the Urban and Regional planning guide on location of health facilities, to include MSDs for conditions that can be handled by lower level health facilities , thereby build capacity at all levels of care. As government moves towards implementation of National Health Insurance, the feasibility of / modality of making payments for technical interventions like orthopedics must be well spelt out in order to enhance reasons for acceptability.

Recommendations for future Research: The incidence of musculoskeletal and connective tissues reflected in the strategic plan of 67 per 100 is too high to leave interventions to chance. Therefore, commonly agreed indicators on MSDs must be part of the Zambia Demographic and Health surveys in order to utilize the public health approach to tackling the conditions through population based intervention strategies. Additionally, the national referral hospital and partners in the referral system must agree on common indicators to include in routine monitoring, improve coordination with other facilities and ensure timely reports that will inform policies and strategies to improve retention in care Lastly for research, more evidence is needed on the fidelity with respect to World Health Organization guidelines among other quality measures for the Orthopaedic services provided countrywide, using other methods.

List Of Abbreviations

AIDS Acquired Immune Deficiency Syndrome

CBM Christian Blind Mission

COMESA	Common Market for Eastern and Southern Africa
CTEV	Congenital Talipes Equinovarus
CSO	Central Statistical Office
DALYs	Disability Adjusted Life Years
FLYSPEC	Flying Specialist project
GRZ	Government of the Republic of Zambia
HIV	Human Immunodeficiency Virus
PHC	Primary Health Care
MSDs	Musculoskeletal Disorders
SES	Socio-economic Status
SJPII	St John Paul II
UNICEF	United Nations Children’s Emergency Fund
UNZABREC	University of Zambia Biomedical Research Ethics Committee
UTH	University Teaching Hospital
WHO	World Health Organisation

Declarations

ETHICS APPROVAL AND CONSENT TO PARTICIPATE

Approval to conduct the study was sought from the University of Zambia Biomedical Research Ethics Committee, Reference number 054-06-17.

Authority to conduct research at the two health Institutions was granted to the researcher by the Lusaka Provincial Health Office and the Lusaka District Health Office as well.

Permission to use the University Teaching Hospital Orthopaedic services data base and the St John Paul II Orthopaedic Mission Hospital data base were obtained from the respective facilities. Additionally, permission for storage of research was obtained from the National Research Authority.

Information was provided on the purpose of the research. Assent for participants under the age of eighteen was obtained from parents and/or guardians while consent for interviews and discussions was

sought from the participants above the age of eighteen.

CONSENT TO PUBLISH

Non applicable

AVAILABILITY OF DATA AND MATERIALS

The dataset from the quantitative arm of the research used and or analysed during the current study are available from the corresponding author on reasonable request

COMPETING INTERESTS

1. S has lived with a congenital anomaly for the last 42 years and in no way has this affected the process of research

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We did not receive any external funding for research

AUTHORS' CONTRIBUTIONS

Q.E.S Research concept; proposal development; data collection; data analysis; interpretation, 1st Draft report

M.C. S Research co supervisor throughout the research phases

R.L.N Principle research supervisor throughout the research phases

Additionally, all Authors have read and approved the final manuscript.

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Continuum of Orthopaedic services available for Use

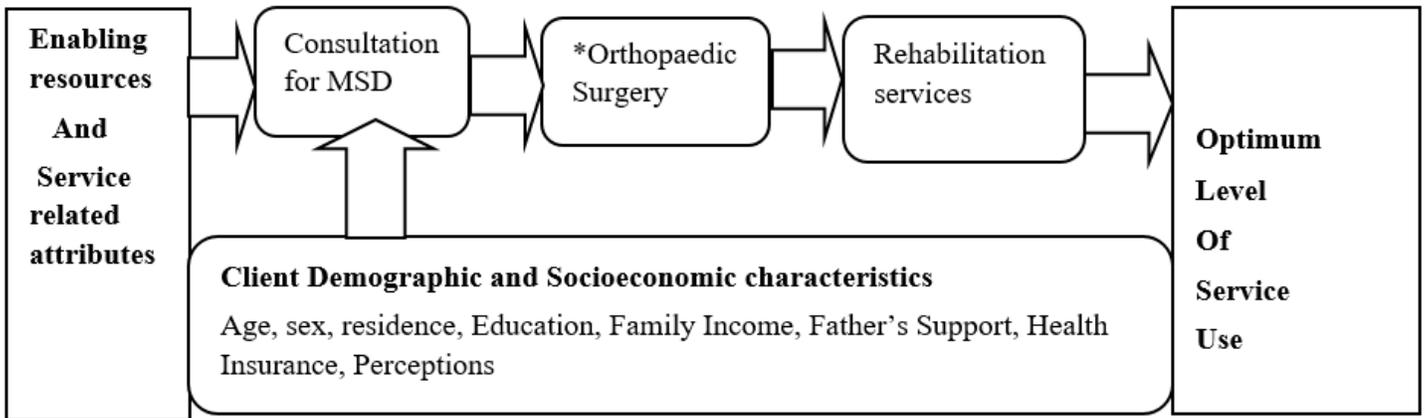


Figure 1

Conceptual framework for Analysis of access to and Utilisation of Orthopaedic services. Source: Adapted from the Anderson framework in Canizares (2014) and McDonald (2007). *Not all cases of MSDs require Orthopaedic surgery

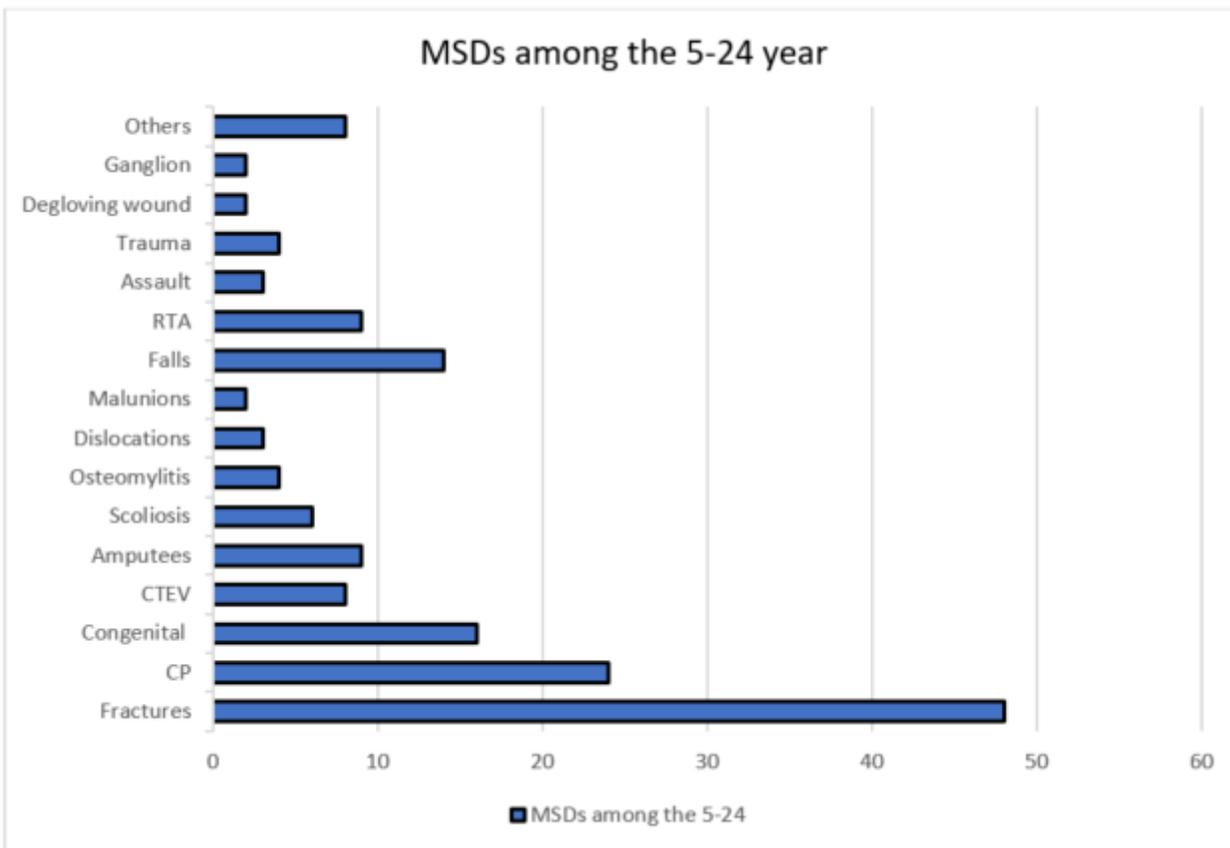


Figure 2

Musculoskeletal Disorders/Conditions among the 5-24 year old studied at UTH and SJPII (n=162)

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