DETERMINANTS OF ORTHOPAEDIC SERVICE UTILISATION AMONG   YOUNG PEOPLE AGED 5-24 YEARS OLD IN ZAMBIA:

A CROSS SECTIONAL STUDY OF SERVICES AT THE UNIVERSITY TEACHING HOSPITAL AND THE ST JOHN PAUL II ORTHOPAEDIC MISSION HOSPITAL IN LUSAKA

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CERTIFICATE OF COMPLETION OF DISSERTATION

I, SEKETI QUEEN ELIZABETH, do hereby certify that this dissertation is the product of my own work and in submitting it for the Master of Public Health in Population studies, further attest that it has not been submitted to another University in part or whole for the award of any Programme.

Signature……………………………Date………………………….

DECLARATION

I, SEKETI QUEEN ELIZABETH, hereby certify that this dissertation represents my own work and the sources I have quoted have been indicated and acknowledged by means of referencing. I further declare that this dissertation has not been previously submitted for a degree, diploma or other qualifications of any university. It has been prepared in accordance with the guidelines for the Master's degree dissertation of the University of Zambia.

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DEDICATION

I dedicate this study with the deepest love to my late Father, Augustine Mwamba Peter Seketi. I thank God Almighty for having given me a father like him- supportive and inspiring. May his grandchildren grow to emulate his good work.

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ABSTRACT

Musculoskeletal conditions and/or disorders (MSDs) are the main causes of disability in many patients even though such disorders can be addressed through orthopaedic care. Some of the known factors that influence the utilisation of Orthopaedic services utilisation include: geographical coverage, availability of human resources, client socioeconomic and demographic characteristics among others. However, the actual levels of Orthopaedic services utilisation with their associated factors in Zambia remain unknown to a larger extent. Most research in orthopaedics in Zambia has focussed mainly on pure clinical research yielding little information on determinants of Orthopaedic services utilisation. This study examined, with a conceptual based multidimensional model, the determinants of Orthopaedic service utilisation among young patients (5-24) at the University Teaching Hospital and the St John Paul II Orthopaedic Mission Hospital in Lusaka, Zambia. 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 10 parents. Quantitative data was collected using a data extraction checklist and self-administered questionnaires for service providers. These contained questions on service attributes and client characteristics. Qualitative data was collected using a semi structured interview guide for interviews with parents. A focus group discussion guide was used to hold one 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 multiple logistic regression. Thematic and content analysis was done for qualitative data.

The study found that the proportion for high level of use was 41%. The determinants included type of service, where clients from physiotherapy 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]; Area of residence, where clients aged 5-24 living in low density residential areas were 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]. Health Insurance was another determinant in which those without Insurance were 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, limited financial and human resources hindered the hospitals from achieving all their objectives. 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.

In conclusion, the study established that those living in low density residential areas and not having some level of Health Insurance were less likely to use Orthopaedic services. Inadequate resources are major barriers to orthopaedic service provision and need to be adequately addressed.

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ABREVIATIONS

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

CHAPTER ONE: INTRODUCTION

1.1 Background

Musculoskeletal conditions and / or disorders (MSDs) are the main causes of disability in many patients even though these can be addressed through appropriate orthopaedic care. In particular, Kamper et al assert that MSDs are the main drivers of the increase in years lived with disability over the past twenty years. Often recurrent in nature and occurring throughout the life-course, attempts to understand these conditions at a time close to their initial onset may offer a better chance of developing effective prevention and treatment strategies (Kamper et al, 2016).

The bones of prehistoric man provide testimony of disorders and injuries of the musculoskeletal system (Salter, 1970). Around 9,000 BC superstitions were replaced by rational thinking. By 5,000 BC, man had already begun to do amputations of diseased and /or damaged limbs. In ancient Egypt it has been noted that splints made of bamboo, reeds and padded with linen have been discovered on mummies (Swarup, 2016) . With regard to ancient Greece, Hippocrates is said to have provided accounts of the treatment of diverse Musculoskeletal disorders (MSDs) including shoulders, knee and hip dislocations as well as treatment for infections which come about after compound fractures.

Literature indicated that access to such specialised services for the general population in the Middle Ages was almost none existent since majority of such conditions often lead to disability. This was the time when disabled persons and/or persons with chronic conditions were treated as unfortunate incurables. It was not until the 17th century, especially in 1601 with the enactment of the Elizabethan Poor law, or commonly known as Poor Relief Act, that care for all those in need was to be provided (ibid). By 1741, Nicholas Andry first coined the word Orthopaedics when he published a book on the art of correcting and preventing deformities in children. It has Greek roots from two words, 'orthos'meaning straight, and 'paidion'meaning child (Ponseti, 1991).

At present, most Orthopaedic services offered by either public and/or private health institutions cover prevention, treatment, care and rehabilitation so that the patient can make full use of their remaining physical, intellectual and social skills. Greater

access to medical services makes populations less susceptible to diseases. Health services are a wide spectrum of personal and community services for treatment of diseases, prevention of illness and promotion of health. The purpose of such services is to improve the health status of populations (Park, 2015). Above all access to health services that encompass orthopaedic services, is a human right.

Spiegel, (2008) observes that up to 50 percent of those with musculoskeletal problems in low and middle income countries receive no medical care and a substantial number receive services at primary health facility staffed by a non-physician provider. Additionally, access to an orthopaedic surgeon is a luxury in most parts of the developing world. WHO (2015) observed that in some African countries, the largest unmet needs were in the area of assistive technology. That only 5 to 15% of assistive technology needs are met. Makasa (2010) also noted that only 11.3 percent of the patients in the Flying Specialist (FLYSPEC) project were attended to at the University Teaching Hospital (UTH), reflecting the continuous deteriorating orthopaedic service provision.

Writers like Adebayo and Gabriel (2010) contend that the huge burden of disease in Africa and the fierce competition for scarce resources makes it a side-line issue. In developed countries, MSDs contributes 3.4 percent of the disease burden while in developing countries, MSDs contributes 1.7percent of the total disease burden. In terms of Disability Adjusted Life Years (DALYs), the burden of disease was about 2.4 times more in developing countries as compared to the developed countries' figure, i.e. 21,076,000 DALYs in the developing world compared to 8,723,000 DALYs in the developed world. The difficulty of obtaining figures for African countries reflects the challenges of not including DALYs as census statistics. It could also be as a result of diseases specific limitations.

Nakua et al (2015) observe that non communicable diseases including MSDs have not been given priority in low and middle income countries. From this assertion, it can be deduced that MSDs have not been accorded much significance in established programmes even those dealing with primary health care and deemed to be cost effective. It can be noted, thus, that although in primary health care there is improved immunisation coverage, health education for mothers attending clinics and higher levels of literacy among women and more children are surviving beyond

their fifth birthday in developing countries, musculoskeletal disorders are rarely included as areas of concern for caregivers to be aware of and take appropriate action.

Given the fact that the world's population is composed of 26 percent of young people between the ages of 10-24 years the burden of such conditions is likely to be felt most poignantly. Young people with chronic conditions are excluded from mainstream general health programming, among the poorest of the world's youth. Moreover, the number of young people with musculoskeletal disorders is likely to increase due to youthful age structures in most developing countries and medical advancements promoting survival rates and increased life expectancy among young people whether disabled through congenital illness or accidents (UNICEF, 2015).

Musculoskeletal disorders require specialised services. With improvements in Technology, a wide range of interventions are possible that ensure positive outcomes for patients. World over, about seven to ten percent of a population have some kind of impairment. Aging; Human Immunodeficiency Virus and Acquired Immune Deficiency Syndrome; age at first childbirth; increase in non-communicable diseases like diabetes, arthritis and nutritional deficiencies as well as genetic disorders and motor accidents contribute to various musculoskeletal disorders requiring orthopaedic services (Christian Blind Mission, 2014).

The importance of Orthopaedic service utilisation for young people can never be under estimated. Adolescence is a particularly unique period in life because it is a time of intense physical, psychosocial, and cognitive development (UNICEF, 2015). Specialised care for adolescence plays an important role in the individual's life. Increased needs to receive adequate care with the changing skeletal mass becomes more important than ever, with at least three year changes for assistive devices and or/ implants (WHO, 2005).

Most importantly, the large numbers of young people in Zambia may present great economic potential but only if they are helped to stay healthy, among other needs. Being among the top 10 causes of morbidity for all ages (MOH, 2017), addressing MSDs is important in order to reduce the disease burden and costs that go towards treatment and also improve human capital (Briggs et al, 2018). This research

adopted the view that access refers to the means or opportunity to approach or enter a place as an operational definition. Lastly, to utilise was defined as to use something in an effective way (Learner's Dictionary). Refer to appendix 8 for further conceptual and operational definitions.

1.2 Statement of the problem

Musculoskeletal and connective tissue and non-trauma are among the top 10 causes of morbidity for all ages in Zambia. Although these conditions can be addressed through appropriate orthopaedic care, the World Health Organisation estimates that less than 5 percent of the population that have impairments access and utilise orthopaedic services. Based on the WHO estimate in the case of Zambia, less than 80,000 people actually use the service demonstrating low service use countrywide. MSD need to be addressed, especially among children and young people. Their bones are still developing and also future ramifications such as the need to have quality human capital and improve productivity. In most instances, including in countries like Zambia, medical care access varies from place to place and also depends on the ability to pay. In the current era of managed care and cost containment and /or reduction strategies, services like orthopaedic surgery and rehabilitation are viewed as expensive services. Other major factors influencing utilisation of Orthopaedic services include geographical coverage and availability of human resources, inadequate space for provision of services among others. Research also points to client socioeconomic and demographic characteristics.

It is worth noting that with a myriad of partnerships in the provision of Orthopaedic services and working within the context of whose Disability and Development policy, there have been extraordinary advances in recent years in Zambia. Programme quality has improved dramatically, with coverage for even poor populations in selected rural areas. Services in the Zambian health system cover treatment, prevention, care and rehabilitation. Most research in orthopaedics has focussed on clinical research. However, given the long term implications of non-intervention, there is need to project Orthopaedics into the public health sphere so that musculoskeletal health among populations is attained. There is need to have in place evidence based primary and /or secondary prevention. Yet there is scanty information concerning factors that affect access to and utilisation of Orthopaedic

services for children and young people in Zambia , suggesting that gaps are still wide in meeting the needs of children and young people with Musculoskeletal disorders. This study was designed to investigate determinants of Orthopaedic service utilisation from both the patient side, and the organisational side. Selecting one public referral hospital, the University Teaching Hospital (according to the national programme's classification) in Lusaka and one mission hospital – the St John Paul II Orthopaedic Mission Hospital, an analysis was done to look for systematic attributes in organisational characteristics that may explain localised deficits, or otherwise, in access and client Social economic characteristics that may affect Orthopaedic service utilisation.

1.3 Conceptual framework

This study used a conceptual framework shown in Figure 1. The adapted version had put "Enabling resources and service related attributes" from the Anderson Behaviour framework cited in Canizares (2014) in place of "Access to primary health care" 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 which analysed quality improvements with regard to care coordination.

Firstly, the *client demographic and social economic 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.

The above in most instances interact and determine access to and utilisation of Orthopaedic services and can be noted in the number of consultations made, surgeries conducted and rehabilitation services used. The conceptual framework below is deemed to depict the variables at play in order to attain optimal level of

orthopaedic service use and offered in-depth understanding and was applied to the setting like Zambia. It integrated the physical component of the health definition. It also offered relevant concepts that incorporated issues in the total environment.

Continuum of Orthopaedic services available for Use

| Enabling resources And Service related attributes | Consultation for MSD | *Orthopaedic Surgery | Rehabilitation services | Optimum Level Of Service Use |

Client Demographic and Socioeconomic characteristics
Age, sex, residence, Education, Perceptions, Family Income, Father's Support, Health Insurance
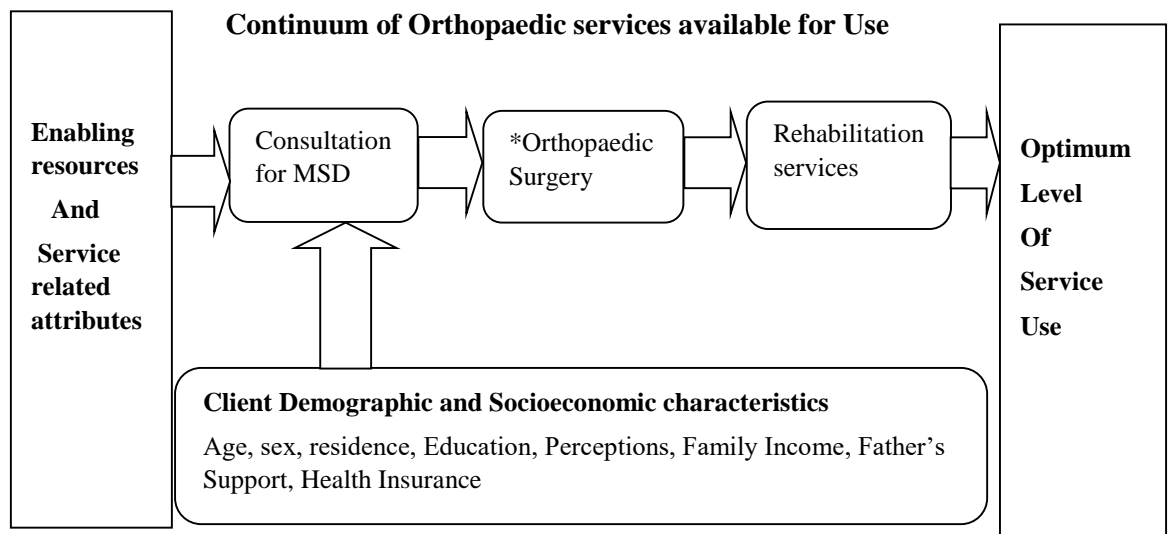
Figure 1: Conceptual framework for Analysis of access to and Utilisation of Orthopaedic services

Source: Adapted from the Anderson framework in Canizares (2014) and McDonald (2007). *Not all cases of MSDs require Orthopaedic surgery

1.4 Justification

i) It is hoped that this study will contribute to the body of knowledge on possible access and utilisation determinants of Orthopaedic services especially among 5 to 24 year olds in Zambia;

ii) The findings from this research could be used by policy makers to make appropriate decisions regarding the future needs that require action;

iii)With regard to practice- it is hoped that if the demand and supply factors could be determined, an orthopaedic practice could better plan for what was needed to serve the needy population As earlier noted, young people with chronic conditions are excluded from mainstream general health programming, and in most instances are among the poorest of the world's population.

1.5 Research questions

i. What are the levels of Orthopaedic service utilisation among a young (5-24) population in Lusaka, Zambia?

ii. What factors affect the clients' ability to approach and use UTH and The St John Paul II Orthopaedic Mission Hospital for orthopaedic services?

iii. What are the service level factors that facilitate and/or hinder service use?

iv. What are the client's perceptions regarding Orthopaedic services?

1.6 Research objectives

1.6.1 General Objective

The main objective of this study was to examine, with a conceptual based multidimensional framework, the determinants of orthopaedic service utilisation among young population (5-24) at UTH and the St John Paul II Orthopaedic Mission Hospital in Lusaka, Zambia.

1.6.2 Specific objectives

i. 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.

ii. 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.

iii. To determine the extent to which selected service attributes affect utilisation of orthopaedic services among young people 5-24 in Lusaka Zambia.

iv. To explore clients' perceptions regarding orthopaedic services among 5-24 population in Lusaka, Zambia.

1.7 Organisation of Dissertation

This dissertation is organised into six chapters. Chapter one gives a background of the research. It highlights the statement of the problem, conceptual framework and other relevant aspects. Chapter reviews literature related to musculoskeletal disorders and known determinants of orthopaedic service use. Chapter three presents the research methodology. This describes the various aspects like variables, indicators and scale of measurement; research design; study setting; site and population. It highlights the sample size calculations and sampling methods, the data collection techniques and tools and the methods of data analysis. Ethical issues among other methodological issues are given. Chapter four presents both qualitative and quantitative research findings in five parts meant to address the research questions around determinants of orthopaedic service utilisation. Chapter five is a discussion of findings while chapter six gives conclusions and recommendations for policy practice and future research.

CHAPTER TWO: LITERATURE REVIEW

2.1 Profile on Musculoskeletal Disorders

Before delving into orthopaedic service practices and factors affecting service use, it is important to have a brief global profile on musculoskeletal disorders and/or conditions. According to the World health Organisation (WHO) in 2017, Musculoskeletal conditions comprise more than 150 diagnoses that affect the locomotor system – that is, muscles, bones, joints and associated tissues such as tendons and ligaments, as listed in the International Classification of Diseases 9th Revision (ICD-9). These range from MSDs that arise suddenly and are short-lived, such as fractures, sprains and strains; to lifelong conditions associated with ongoing pain and disability.

Musculoskeletal conditions include conditions that affect joints, such as osteoarthritis, rheumatoid arthritis, psoriatic arthritis, gout, and ankylosing spondylitis. Other Musculoskeletal conditions affect bones, such as osteoporosis, osteopenia and associated fragility fractures, traumatic fractures. In other instances muscles are affected and give rise to conditions such as sarcopenia. Musculoskeletal conditions affect the spine, such as in back and neck pain; and multiple body areas or systems, such as regional and widespread pain disorders and inflammatory diseases such as connective tissue diseases and vasculitis that have musculoskeletal manifestations, for example systemic lupus erythematosus (WHO, 2017).

In the general population globally, the most common and disabling musculoskeletal conditions are osteoarthritis, back and neck pain, fractures associated with bone fragility, injuries and systemic inflammatory conditions such as rheumatoid arthritis. The characteristics of musculoskeletal conditions include persistent pain and limitations in mobility, dexterity and functional ability. This in turn reduces people's ability to work and participate in social roles with associated impacts on mental wellbeing and at a broader level impacts on the prosperity of communities. As for signs and symptoms of MSDs, pain and restricted mobility are the unifying features of the range of musculoskeletal conditions. Pain is typically persistent for long-term conditions. In some conditions, joint deformity may occur, where early diagnosis and treatment are not available (Briggs et al, 2018).

Medical literature reveals that prevention and management of musculoskeletal conditions can be done. Behavioural risk factors are common with other non-communicable diseases, such as inadequate physical activity, obesity, smoking and poor nutrition which can be avoided as a way of preventing MSDs. Additionally that musculoskeletal pain share similar characteristics and may respond to similar treatment. While management of some musculoskeletal conditions often requires specialist and/or surgical care, many musculoskeletal conditions can be managed in primary care through a combination of core non-pharmacologic interventions such as exercise and psychological therapies and pharmacologic therapies (WHO, 2017; Babatunde et al, 2017 and Artuse et al, 2017).

2.2 Orthopaedic Service practices and Service Factors affecting use

In Ireland, Australia, Canada, Uganda and Rwanda, the service context for orthopaedics among a young population is concerned with the prevention and treatment of Musculoskeletal disorders in three areas. These include the management of acute trauma and its sequelae ; the management of normal variation , postural and "packaging disorders and deviations in musculoskeletal development and the provision of highly specialised Orthopaedic services to children and young people who have Congenital deformities, neurological and neuromuscular conditions and acquired musculoskeletal conditions (State Government of Victoria, Australia, 2009). In the Zambian case, very little was known about the holistic orthopaedic service context for young persons.

A study done in Ontario (Badley, 2007)showed that in the Canadian situation, the prevalence of musculoskeletal conditions warranting orthopaedic services was due to the ageing population and increasing rates of non-communicable diseases like diabetes. The above research was carried out in order to update provision estimates of orthopaedic surgeons, examine practices and perceived barriers to such services and to relate geographic availability of surgeons to population utilisation of office based and surgical orthopaedic services.

Data were obtained through a self-administered questionnaire for surgeons and population based data were obtained from the health service administrative data base for the year 2005 to 2006 in Ontario. Results indicated that service provision varied. Among other findings, low orthopaedic provision was associated with lower

utilisation of office based services after controlling for shortages and geographic variation, especially in the supply of surgeons meant reduced access to office based services (Badley, 2007).

This study was included because it offered a structure similar to the way orthopaedic services in the Zambian case are setup. The limitation it had was that the social demographic factors of its population were that of a developed nation who can meet their primary care needs and have a stronger social welfare scheme of support compared to countries like Zambia.

Similar research was done by Canizares on the role of access to primary care and availability of orthopaedic services in Ontario. The research objective was to examine the impact of access to primary care physicians, geographical availability of surgeons, proportion of older population and proportion of rural population on orthopaedic surgeon office visits and orthopaedic surgery. The multilevel study targeted residents who had visits to a primary health care physician who later referred these patients to the orthopaedic surgeon.

The study was useful as it included a definition of musculoskeletal disorders and enabled the researcher to come up with an inclusion criteria in the study. Musculoskeletal conditions covered in the said study included arthritis and related conditions (osteoarthritis, rheumatoid arthritis); Injury and related conditions fractures, dislocations, sprains and strains, joint derangements and other trauma as well as bone and joint conditions.

The results of the study indicated that access to office based service is crucial for securing surgical intervention. This ecological study had limitations such as lack of individual data associated with need for healthcare such as Social Economic Status and used region level data were incomes were concerned. The study did not encompass barriers to surgery or preferences of physicians in managing common Musculoskeletal Disorders (Canizares, 2014).

If access to office based services and/or indeed other administrative aspects are important to secure much needed intervention, then it can be deduced that such aspects need to be addressed as part of health systems that are meant to contribute to positive health outcomes. This idea can be further said to be related to the fact

that human resources for health have to be organised in such a way that they facilitate increased uptake of health interventions at diverse levels.

Despite the limitations cited by Canizares, such as not encompassing barriers to surgery or physician preferences, the above study was useful because of its conceptual framework. The current study had adapted her conceptual framework and modified it to include rehabilitation services. This was because most of the orthopaedic conditions tend to receive much attention after they have occurred, similar to the situation in developing countries. Although now considered as a lower middle income country, Zambia still has medical care services which differ sharply from medical care in Industrialised countries. For instance the immediate concern is whether an orthopaedic surgeon could actually be available given shortages of human resources for health in general, the cost of the service, inadequate referral systems and challenges of client follow ups among other service rated barriers.

In looking at the service related barriers to optimal utilisation of Orthopaedic services, it has been generally agreed that worldwide, there are shortages of human resource for health (World Health Organisation , 2006) (Zulu, 2015) and (Derbew, 2016). Measures have been made before to bring Orthopaedic services to rural communities as well. Additionally, (Sampa, 2017) observed that there was a critical shortage of qualified professionals in Prosthetics and orthotics. That there were 13 for a total Zambian population of 13,092,666 – the 2010 census population of Zambia. This research included the aspect of human resources for health, especially professionals dealing with MSDs among the population in order to give a current picture and give ratios that would be based on the projected population for the year under study at the two institutions.

If MSDs are not adequately addressed, there are social and economic implications. The health and broader social cost of musculoskeletal conditions are significant. Spending on musculoskeletal conditions is challenging to measure due to the vast array of musculoskeletal conditions and limitations in health surveillance systems. Orthopaedic surgery procedures, for example total joint replacement, account for one of the greatest hospital expenditures. Data are particularly scarce in low- and middle-income areas. Musculoskeletal conditions account for the greatest proportion of lost productivity in the workplace. In 2011, musculoskeletal

conditions cost US$ 213 billion that is 1.4 percent of Gross Domestic Product (WHO, 2017).

For most of Sub-Saharan African countries including Zambia, it is argued that social and economic development is constrained by the region's rapid population growth. Over the last 49 years, the population of Zambia has increased about four times, from 4,057,000 people in 1969 to about 15,900,000 in 2017 (CSO, 2013). This constrains the quality of life and provision of social services like health to cater for a growing population. Rapid population growth hampers the improvement in health and delivery of services in that combined with modest economic development, it is difficult to maintain or upgrade services.

It is good to note that in the Zambia situation, funding for orthopaedic services is included in the budget for the public health institutions and mission hospital support is also done alongside donor support. This is in an effort to provide free services to the majority of the people in Zambia, as part of Universal Health Coverage, "Leaving no one behind" (MOH, 2017). However, given the many sectors which require support and the scarcity of resources, literature reveals that implementation of the budget is dependent on Government meeting the revenue targets. In 2017, the budget allocation for health was 8.9 percent of the K64.5 billion budget. Besides, the Zambian budgets faces risks such as any reversal in the recently improved copper prices, any deterioration in the exchange rates, borrowing beyond sustainable levels among other risks (Grant Thornton Zambia, 2018).

Writers also observe that according to the Abuja target, the health sector should be allocated 15percent of the Budget in order to address Universal health coverage (USAID, 2016).Despite knowing the percentage allocation to the sector, very little was known about the actual cost of orthopaedic services for young people in Zambia, referral systems and mechanisms for client follow up. In a free market economy like the Zambia one, there is need for innovating care systems that deliver better outcomes and at lower or equivalent costs as well.

Musculoskeletal health should be part of non-communicable diseases national policy reform (Briggs et al, 2018), hence, other service related factors looked at in this research were that of guidelines used in service provision. This is due to the

fact that Health status and/or service utilisation is determined by a range of factors, including access to healthcare, socioeconomic variables, working and living conditions, and cultural environment. This makes government policy key in guiding the implementation of programmes.

At the global governance level, the Alma Ata declaration, "Health for All", states that health depends not only on having access to medical services and means for payment for services, but also an understanding of the links between social factors and the environment. Universal health coverage is necessary in order to reach the sustainable development goals. The goal for universal health coverage is rooted in politics and international law, and is a human rights issue. The 1948 declaration of human rights states that everyone has the right to an adequate standard of living for health, including medical care. Primary healthcare should be available irrespective of ability to pay (Magnusson, 2014).

The global response includes that the world body which oversees health matters across nations, World Health Organisation (WHO), recognises that musculoskeletal health conditions contribute greatly to disability across the life-course in all regions of the world. The WHO is responding through several initiatives. For example, in 2005, the World health Organisation had put in place guidelines pertaining to the training of Prosthetists and Orthotists to meet the needs in developing countries (WHO and ISPO, 2005). More recently, the need to address impairments in musculoskeletal health is also identified in WHO's Global Programme of Work in rehabilitation, in order to improve peoples' performance. Prevention of musculoskeletal trauma is addressed in WHO's Global Programme of Work on road traffic injuries (WHO, 2017).

Literature reveals that elsewhere on the globe, especially in Australia in the state of Victoria and in Ireland, provision of services for children and young people follows the 2007 guidelines and principles highlighted in the "framework for paediatric orthopaedic services". These include: The overriding objective of enabling the delivery of quality care that achieves an optimal balance between access, safety, effectiveness, appropriateness, efficiency and acceptability to children and their families. When an acceptable level of quality can be achieved, services will be provided in local communities; Specialist centres will provide primary and

secondary services to their local communities as well as tertiary services to children and young people and their families from across the state and where appropriate interstate (State Government of Victoria, Australia, 2009).

Yet another guideline includes that there will be an identifiable service system structure and linkages which facilitate appropriate referrals and quality professional interaction between providers and lastly, that a multidisciplinary workforce is required that has skills, knowledge and attitude to work effectively in responding to the orthopaedic needs of children and their families and that distributes responsibilities within clinical teams to those who are best equipped to meet them (ibid). This is similar to the Zambian case where, provision of orthopaedic services is done under the health systems with qualified staff. There was a gap in ascertaining the type of policies and guidelines used in the provision of orthopaedic services to the primary target groups in Zambia.

2.2 Client Demographic and Socioeconomic Factors associated with Orthopaedic Service Utilisation

Client demographic and social factors were included in this study. With regards to age and sex, literature reveals that musculoskeletal conditions affect people across the life-course in all regions of the world. While the prevalence of musculoskeletal conditions increases with age, younger people are also affected, often during their peak income-earning years (WHO, 2017). While in another instance, an Australian study showed that for both boys and girls, the rate of musculoskeletal problems managed increased significantly with age (Clinchi, 2009).

Research on the relationship between socioeconomic position and health services use has been conducted before. A study in Spain was done to determine whether the findings would be compatible with the attainment of horizontal equity: equal use of public healthcare services for equal need. In the said research, data from a sample of 18,837 Spanish subjects were analysed to calculate the percentage of use of public and private general practitioner (GP), specialist and hospital care according to three indicators of socioeconomic position: educational level, social class and income. The percentage ratio was used to estimate the magnitude of the relation between each measure of socioeconomic position and the use of each health

service (Spiegel, 2008). After adjusting for age, sex and number of chronic diseases, the study found that persons in the lowest socioeconomic position were 61 to 88 percent more likely to visit public GPs and 39 to 57 percent more likely to use public hospitalisation than those in the highest socioeconomic position. Inequity in GP visits and hospitalisations, favouring the lower socioeconomic groups, and inequity in the use of the specialist physician. These inequities could represent an overuse of public healthcare services or could be due to the fact that persons in high socioeconomic positions choose to use private health services (ibid).

To comment on the above, favouring the lower socio economic use is part of pro poor health service use desired by policy makers. This is because the poorest have higher need of health care services and the expectation is that they should have higher use.

A study by Dy in 2015 showed results which highlighted inequalities in a different manner. Their study showed inequalities in the use of orthopaedic services among paediatric populations. Although this study did not include young people aged 18 to 24 like in the current research, (but covered the children below 18) it is worth noting that they observed that socioeconomic factors are associated with frequency of repeat emergency department visits for closed paediatric fractures. The purpose of their study was to determine whether socioeconomic factors, such as race and insurance type, were associated with the frequency of repeat Emergency Department visits in pediatric patients aged 17 and below with closed fractures (Dy, 2015). Out of the 68,236 visits reviewed, the revisit rate was 0.85 percent. They concluded that non-white patients were more likely to return to the Emergency Department within eight weeks for the same fracture diagnosis. Patients with government insurance were 55 percent more likely to have a revisit, while patients with private insurance were 28 percent *less* likely to have a revisit (ibid).

In Africa, a study that highlights the influence of socioeconomic factors on the utilisation of health services was done in Dar es Salaam (Wyss, 1995).Using a sample size of 6,589, this household survey found that use of government services clearly decreased as the level of education, socioeconomic class and wealth status of the zone of residence of the ill person increased. Conversely in the study sample, there was an apparent tendency for people with a high level of education or

belonging to a rich socio-economic class to use private facilities more often than public health facilities.

A survey highlighted out of pocket expenditures on health in Mauritius. In addition, 3.6 percent of households in the republic experienced catastrophic expenditure in health. This was because these households spent greater than or equal 40 percent of the income available after basic needs have been met, on health care   (Ministry of Health and Quality of Life, 2015).The Zambia Health Expenditure and Utilisation Survey by the Ministry of Health and CSO in 2013 found that there are other factors that influence health care use other than health status. The study found that utilisation was influenced by income, insurance type, type of illness and access variables like distance and owning a vehicle (Ministry of Health and CSO, 2013).

Other studies revealed contrary views, that poverty is a barrier to health service utilisation in general such that the hospital is the last place someone goes to, however, the condition could have gotten worse (Grimes, 2011).

When it comes to health insurance, a study done in the United States of America aimed to look at whether insurance coverage may impact access to care and the patient's ability to return to the operating room for outpatient surgery. A retrospective review of supracondylar humerus treated at a large urban paediatric hospital from 2008 to 2012 was performed. Results revealed that patients with private insurance were 2.46 times more likely to have surgery than patients with public or no insurance. The conclusion was that patient insurance status and the ability to follow up in a timely manner should be assessed at the time of initial evaluation in the emergency department (Fletcher, 2016).

Another study by Daniel Wiznia et al (2017) assessed the effect of insurance type on patient access to orthopaedic surgery. In this cohort study, 180 surgeons were called in six states California, Ohio, New York, Florida, Texas and North Carolina between June 2015 and December 2015. Appointments for a fictitious 25 year old brother who had suffered a bucket –handle meniscus tear. Each office was called twice to assess ease of obtaining appointment. Patients with private insurance were given appointments more i.e. 91 percent with associated p value of 0.0001. Patients

on Medicaid insurance received less appointments due to lack of referral at 40.2 percent (Wiznia, 2017).

Mark Brinker in the article en titled Capitated insurance contract noted that the utilisation of Orthopaedic services by a population of persons sixty six years of age or younger enrolled under a commercial capitated contract depends on the age and gender of the population. He observed that generally, the rates of orthopaedic office visits and surgery increases with age and gender of the population. That males have higher utilisation rates in early adulthood and females have higher utilisation rates in later adulthood (Brinker, 2002).

A survey done by Central statistical office and partners noted that ideally, access to health care improves when individuals are covered by some form of health insurance. However, the vast majority of women and men in Zambia do not have any health insurance (97 percent each). Among women and men with health insurance, 2 percent have employer-based insurance and less than 1 percent has other types of health insurance such as social security, mutual health organisation or community-based coverage, or privately purchased commercial insurance. There are no major variations in health insurance coverage by background characteristics (Central Statistical Office (CSO) [Zambia], Ministry of Health (MOH) [Zambia], and ICF International., 2014).

The World Economic and Social Survey conducted in 2013, revealed that the place of residence is yet another demographic factor that can have profound implications for population health. Due to rapid urbanisation, more than half of the world's population lives in urban areas in developing countries. However, there are disparities within cities because living conditions in ghettoes and slums [unplanned settlements] put poor people at higher risk of disease and injuries and they tend to have less access to health services. Therefore, rapid urbanization, especially in developing countries, calls for major changes in the way in which urban development is designed and managed, as well as substantial increases of public and private investments in urban infrastructure and services (DESA, 2013). Similarly, it has been observed in Zambia that the majority of residents live in squatter and unplanned settlements with little or no access to health services within their communities (GRZ, 2016).

To address such issues, literature reveals that there are measures to address health matters in all policies. For instance, the Ministry of Local Government and Housing in Zambia has guidelines on health infrastructure. In particular, it was noted that local clinics/ health facilities should be located within two kilometres of housing. These structures could play a critical role in not only promoting health awareness and education but addressing minor ailments and injuries, thereby, avoid negative ramifications such as hospital treatment and absenteeism (Ministry of Local Government, 2016). With a referral hospital located in Lusaka, it was unknown how area of residence could hinder or facilitate access to and /or utilisation of Orthopaedic services among the 5 to 24 year population in the selected study area.

Another client social demographic variable which was included in our conceptual framework was that of self-rated health, in the realm of perceptions. Perceptions are subjective and fall within the individual level. For instance, a study in Spain showed that self-rated health was a good indicator of individual use of hospital service. Although subjective, the measure relates to people's willingness to make an effort to maintain a good state of health (Tamayo-Fonseka, 2015). Although parents acted as a proxy and they tend to make decisions for children, it was not known whether self-rating of health, in terms of poor or good, had a bearing on the utilisation of orthopaedic services in Zambia.

Another qualitative study was done in the United Kingdom (UK) with the aim of providing a better understanding of the psycho-social demands of parenting a child with Clubfoot. In-depth interviews were conducted with 15 families (four joint and 11 single interviews) in the UK. Three key themes from participants' accounts were identified including emotions and perceptions associated with the diagnosis of Congenital Talipes Equinovarus (CTEV); parenting a child with CTEV and parents' concerns about the child's future. The study found that participants experienced a range of negative emotions similar to those experienced by parents of children with what are considered to be more disabling conditions. They proposed that more attention be paid by healthcare professionals to the emotional impact on parents of their child's CTEV diagnosis and treatment. More encouragement, information and support from health professionals could increase parental interest in the treatment as well as their satisfaction and will result in

decreased non-compliance with treatment due to a lack of knowledge (Pietrucin-Materek et al, 2015).Literature also revealed that studying patient centred aspects such as adjustment and copying is important as these are cardinal modifiers of patient outcome and predictors of how patients feel and perceive life. Socio-emotional interactions are part of effectiveness of health services as they support enablement (Pawlikowska, 2015).

Additionally, our study included the perceived benefits of using orthopaedic services in the qualitative part of the study. According to the theories of incentives, incentives are among the factors that stimulate and encourage specific behaviours. Incentives can either be intrinsic and extrinsic. Intrinsic incentive is the benefit that comes from solving one's own problems. Extrinsic incentives are rewards that do not relate directly to the goal towards which desired behaviour is aimed (Park, 2015). In the Zambian situation, very little was known about clients' perceptions on rewards and /or the good things that come as a result of using orthopaedic services.

Lastly, social factors studied in order to learn if there was anything in the social environment that facilitated and/or hindered orthopaedic service use, among the 5-25 age groups in the quest to attain positive health outcomes. According to the social constructivist theory, people do things because of the expectations of those in their personal work or in the wider society in which they live (Amineh, 2015).

CHAPTER THREE: RESEARCH METHODOLOGY

The research methodology describes the various aspects like variables, indicators and scale of measurement in table 1; research design; study setting; site and population. It highlights the sample size calculations and sampling methods, the data collection techniques and tools among other aspects.

3.1 Variables

Table 1: Variables, indicators and scale of measurement

Variable	Indicator	Scale of measurement
Dependent Variable: *1. Level of Orthopaedic service utilisation*	• Number of hospital visits for MSD per person per year	Interval
	• Type of service a person has used in the last year	Nominal
	• Reason for the service/type of MSDs	Nominal
	• Level of orthopaedic service utilisation was the use of service with at least one visit to the hospital taking into consideration the first three points above : **High /Low**	Ordinal/Binary
Independent Variables: **2.**Demographic,socioeconomic *Characteristics:* 2.1 *Age*	• Age at last birthday in years	Interval
2.2 Sex	1. Male 2. Female	Nominal
2.3 Education status (if < and > 12 years)	Number of years young people spent in formal schooling : 1.None, 2. Primary , 3. Secondary, 4. Tertiary	Ordinal

Variable	Indicator	Scale of measurement

	Number of years mother spent in formal schooling : 1.None 2.Primary, 3.Secondary, 4 Tertiary	Ordinal
Independent Variables: 2. *Demographic, social economic Characteristics:* 2.4 Occupation	unemployed, Employed, informal employment or housewife	Nominal
2.5 Income	The amount of earnings Low(<K 2,500) Medium(K 2,600.00-K3,500.00) High (>K 3,500.00.00)	Ordinal

2.6 Area of Residence	1. Urban: Low density
	           Medium density
	           High density
	 2. Rural
		Ordinal

2.7 Health Insurance	1. Presence of/or own health insurance 2. Type of health insurance 3. Source of health insurance	Nominal
2.8 Treatment outcome	1. Recovered /or healed 2. Chronically ill 3. Worse/Died	Nominal
2.9 Social Support	1. Sources of social welfare support (NGO, Church, Government ,etc) 2. Mode of support 3. Reasons for social support	Nominal

3.0 Enabling service related resources and Attributes with Respect to:		
3.1 Effectiveness of services	1.Number of health providers by population,	Ratio
	2. Availability of equipment/supplies and policy guidelines	Ordinal
	3. Presence of adequate space,	Nominal
	4. Client-provider interaction,	Nominal
	5. Satisfaction with/ or safety of service	Nominal
3.2. Efficiency of services	1. Client waiting time	Interval
	2. Client-provider contact time,	
	3. Hospital clinic appointment time/ or clinic schedule timing,	
3.3. Referral system	1. Number of clients referred	Interval
	2.Reasons for referral	Nominal
3.4 Cost of service	1. Amount paid by service	Interval
	2. Cost of service per person by treatment outcome	Ratio
Independent Variables:	**Indicators**	
Client Perceptions	1. Positive and negative Responses to service; 2. Reasons for acceptability	

3.2 Research Design

This study used a Cross Sectional study design, with an embedded mixed methods study design. The quantitative aspect of the study was used to quantify observations and analyse any statistical significance for associations noted. In order to address the differential and/or subjective experiences of clients, this study also used

qualitative methods in order to have an insight of the perceptions and experiences of children and their care givers and young people, with regard to orthopaedic service utilisation among other views.

The two methods were included in order to offset each other's limitations. The validity of results was strengthened by using more than one method to study the same phenomenon. This approach —called triangulation—is most often mentioned as the main advantage of the mixed-methods approach. In particular, combining the two methods paid off in improved instrumentation for all data collection approaches and in sharpening the researcher's understanding of findings (Altshuld, 2002) .

3.3 Study setting, site and population

Zambia is a land-locked country in Southern Africa, located between latitude 8 and 18 degrees south and longitudes 22 and 34 degrees east. The country borders the Democratic Republic of Congo to the north, Tanzania to the northeast, Malawi to the east, Mozambique, Zimbabwe and Botswana to the south, Namibia to the southwest, and Angola to the west. Zambia covers a land area of 752,612 square kilometers. It has a tropical climate and vegetation with three distinct seasons: the cool dry winter from May to August, a hot dry season during September and October, and a warm wet season from November to April (CSO, 2013).

It is projected that Zambia's population stood at 15.9 million people in 2016, with an urban population share of 42 percent. About 52 percent of the Zambian population comprises children below the age of 18(CSO, 2013). Zambia has ten provinces and 105 districts (CSO, 2018). Of the 10 provinces, two are predominantly urban, namely Lusaka and Copperbelt. The remaining provinces including Central, Eastern, Muchinga, Northern, Luapula, North Western, Western, and Southern are predominantly rural. The capital city is Lusaka, in the south-central part of the country.

Study participants were drawn from two hospitals, a public health institution, the University Teaching Hospital and a mission hospital, the St John Paul II Orthopaedic Mission Hospital in Lusaka. The University Teaching Hospital (UTH) is a Public health National referral hospital. The Vision of UTH is to be the Centre of Excellence for health care in the country and the region by providing innovative

treatment interventions through ongoing research, while the mission statement is to provide affordable quality health care; function as a referral centre; train health care providers; conduct research to find solutions to existing health problems and for the development of science. Over a period of time, the institution has built capacity in various areas of specialization such as Cardiology; Cardiac Surgery, Anti-Retroviral Treatment, Prevention of Mother To Child Transmission of HIV, Ophthalmology, Ear, Nose and Throat, Urology, Orthopaedics and Pulmonary medicine. Thus, the hospital offers specialised health services including highly technical interventions like Orthopaedic surgery, Physiotherapy, prosthetic and orthotic fitting among other services. The activities of UTH are centred on the following objectives:-

1.   provide general health care to all citizens of the Republic of Zambia
2. To train health care personnel in medicine, nursing, physiotherapy, Radiography and other related paramedical disciplines.
3. To conduct research to establish better management of commonly occurring diseases in Zambia and the Southern Africa region and
4. To act as a referral centre for all the country's medical needs where such needs cannot be cared for by peripheral medical institutions.

On the other hand, the St John Paul II Orthopaedic Missionary Hospital is run by missionaries of the Catholic Church. It was established to provide comprehensive treatment of persons with disabilities in Zambia. The hospital handles diverse health conditions including muscular skeletal conditions with a special concern for children and the needy in society. The hospital provides ex-ray examinations; laboratory tests; surgical interventions; ward admissions; physiotherapy and prosthetic and orthotic fitting. At the time of the study, the St John Paul II had a bed occupancy of 42, managed by a team of five sisters residing at the hospital compound. The Hospital offered not less than 200 free world class orthopaedic facilities to children with different physical disabilities. From the year 1995 to 2018, the hospital was said to have successfully carried out 15,969 surgeries of which 9,129 were done free of charge (St John Paul II Orthopaedic Mission Hospital, 2016).

The study population comprised Orthopaedic service providers at the two institutions and their clients and/or caregivers. Of these, the primary target population included children and young people between the ages of 5 to 24. For children below five, their parent and/or caregiver acted as a proxy. The secondary target was the service providers.

3.4 Sample size and sampling methods

3.4.1 Sample size calculation

In order to calculate the sample size, the formula for sample size calculation herein adopted was that of a Cross Sectional Study, using proportion (Daniel, 2010).

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

z = Z score, 1.96 at 95 percent confidence Interval

p = 5 percent (0.05) estimated proportion of a given population likely to have needs met [use orthopaedic services in Zambia], (WHO and UNICEF, 2015).

q=1-0.05

d= two sided/alpha, at 0.05

$$n = \frac{1.96^2 \ x \ 0.05(1 - 0.05)}{0.05^2}$$

$$n = \frac{3.8416 \ x \ 0.05(0.95)}{0.0025}$$

$$n = \frac{0.182476}{0.0025}$$

$$n = 72.9904$$

The necessary sample size using the above formula was 72.9904 x 2= 145.9808 =146 for the two hospitals. Taking into consideration non-response at 10 %, final n = (100/100-10) x 146=162.

3.4.2 Sample design and selection

The total sample size was about 162. In order to draw a sample for the primary target from the two institutions various sampling methods were used.

(a) Quantitative sample: Stratified random sampling was used to draw a sample of 162 children and young people from the hospital registers of the University teaching hospital and the St John Paul II Orthopaedic Mission Hospital in Lusaka. The stratification was by hospital. The samples to these two strata were allocated proportionately taking into account the number of patients in each of the hospitals.

Proportion per hospital = (number of orthopaedic clients per hospital during study year / combined number for the two hospitals) x 162. Thus 94 children and young people 5 to 24 years were drawn from the UTH while 68 were from the St John Paul II hospital to have a total 162. The sampling frame was the hospital orthopaedic registry for the two respective hospitals.

(b) Qualitative sample: (i) convenient sampling was used to draw a sample of six out of the planned 10 young people and 10 out of the 10 parents of children below 15 years from the outpatients department and outreach programmes at the two institutions. This was in order to enlist qualitative information from them, with respect to their perceptions on orthopaedic services. The deviations for the targeted number for the focus group discussion was due to the fact that six young people made it to the venue and the rest were committed. It was felt that the six would provide the subjective information needed especially that after the fifth person, saturation was attained.

(ii) In addition, purposive sampling was used to select a sample of eight out of the planned 10 service providers from the two hospitals included in the study. These comprised two Orthopaedic surgeons, two technologists, two Nurses, a Physiotherapist and a medical social worker. The number of respondents was less , eight out of the planned 10, because of none response from a physiotherapist from UTH and there was no social worker employed at the St John Paul II Orthopaedic Mission Hospital to fill in the semi structured questionnaire for the medical social worker.

3.5 Inclusion and exclusion criteria

Inclusion criteria: For the clients, those 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.

Service Providers: Those who were currently employed at the two institutions to provide Orthopaedic services

Caregivers: Persons directly involved in the care of the clients, guardians /parents

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

3.6 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:

3.6.1 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, refer to appendix 4 for further details.

Self-administered, semi-structured 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. Refer to appendix 5 for a copy of the questionnaire.

3.6.2 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.

3.7 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.

3.8 Data analysis

3.8.1 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 the 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 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).

3.8.2 Qualitative component

From the qualitative part, all open ended questions from the semi structured interview guide were coded manually. The common themes from the discussions were deduced, coded and presented as part of thematic analysis. In this regard, the study included a semi structured questionnaire with both open ended and closed ended questions to capture the perspectives 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.

3.9 Ethical considerations

Firstly, Authority to conduct research was also granted to the researcher by the Lusaka Provincial Health Office and the Lusaka District Health Office. Secondly, approval to conduct the study was sought from the University of Zambia Biomedical Research Ethics Committee, Reference number 054-06-17. 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 18 and consent for interviews and discussions from the participants were sought. 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.

3.10 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.

3.11 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 categorised 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 endeavoured 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. For some of the values that were missing such as household incomes, mother's level of education, total costs of orthopaedic services from the cost centres, the general population projections from Central Statistical office, GRZ annual budgets and service provider reports were used.

CHAPTER FOUR: FINDINGS

This chapter presents the findings based on a sample of 162 .The main objective of this study was to examine, with a conceptual based multidimensional framework, the determinants of orthopaedic service utilisation among young population (5-24) at UTH and the St John Paul II Orthopaedic Mission Hospital in Lusaka, Zambia. Data collected was among a study sample of 162 from the two hospital registries. The findings of the study were organized into five sections:-

1. Descriptive results
2. Level of Orthopaedic services utilisation
3. Client demographic , socioeconomic characteristics and Utilisation
4. Enabling , service related characteristics and Utilisation
5. Client perceptions regarding Orthopaedic services

4.1 Descriptive results

In the descriptive results section, various frequencies and proportions were noted. The findings in Table 2a below show the distribution of the sample by health facility providing orthopaedic services.

4.1.2. Description of sample by facility

Table 2a: Description of sample by facility (n=162)

Health facility	Frequency	proportion
University Teaching Hospital (UTH)	94	58%
St. John Paul II Orthopaedic mission hospital	68	42%
Total	**162**	**100%**

A higher proportion of 58.02 percent were sampled from the University Teaching Hospital, while about 42 percent were from St John Paul II mission hospital. The findings in Table 2b below show the distribution of the sample by health facility providing orthopaedic services and the level at which clients were utilising these services.

Table 2b: Description of sample by facility and level of Utilisation (n=162)

Health facility	Level of Utilisation			P value (Chi-square)
	Low f (%)	High f (%)	Total	
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%)**	

Overall, 37 percent (60/162) of clients was from St John Paul II and had low levels of service utilisation while 19.5 percent (32/162) was the lowest proportion from the UTH and were in the category of those with high level of orthopaedic services utilisation. However, the associated p value was 0.164 for health facility versus level of orthopaedic service utilisation.

4.1.2. Demographic Characteristics

Table 3a: Client Demographic Characteristics by Level of Orthopaedic Services according to Health Facility (n=162)

Characteristics	Health Facility		Total	P value (Chi-square)
	UTH	St John Paul II		
Age group				Fisher's exact *0.088
5-9	39 (24.1%)	28(17.3%)	67 (41.4%)	
10-14	23 (14.2%)	26(16.1%)	49 (30.3%)	
15-19	16 (9.9%)	10 (6.2%)	26 (16.1%)	
20-24	16 (9.9%)	4 (2.5%)	20 (12.4%)	
Total	**94 (58%)**	**68(42%)**	**162 (100%)**	
Sex				0.381
Male	53(32.7%)	43(26.5%)	96(59.26%)	
Female	41(25.3%)	25(15.4%)	66(40.7%)	
Total	**94 (58%)**	**68(42%)**	**162 (100%)**	

The Table 3a above shows that the majority of users by facility were at 24.1 percent (39/162), belonging to the 5-9 year age category and these had used orthopaedic services at the University teaching hospital.

In terms of gender, 32.7 percent (53/162) were males from the UTH while the lowest proportion comprised females from the St John Paul II at 15.4 percent (25/162).

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

Some of the further comments with regard to descriptions of clients according to the demographics by the level of Orthopaedic service utilisation in table 3b (using the cell totals   include) include comments on age, sex, education and occupation/employment:-

Age

From the proportions alone, it was noted that most of the low users were in the 5 to 9 age category at 26 percent (45/162). While the 20 to 24 age group made up 6.8 percent (11/162) and had low level of orthopaedic service utilisation. In the study sample, the number of patients was reducing with increasing age thereby making the proportions to reduce as the age categories increased.

Sex

The highest proportion was from among male users at 38 percent (62/162) and were likely to be in the category of clients with low levels of orthopaedic services utilisation. While at the same time slightly more male clients made up 21 percent (34/162) of clients with high level of orthopaedic services utilisation compared to their female counterparts at 20 percent (34/162) and with high level of use.

Education

The findings were that the majority of clients, 13.6 percent (22 /162) had attained only primary level of education and were in the category of clients with low levels of orthopaedic services utilisation. For clients below the age of 12, the mother's education status was captured, hence the appearance of N/A in the above findings. Similarly, most of the mothers, 29 percent (47/162) had attained at least primary level of education and their children were in the category of those with low level of orthopaedic service utilisation. Only very few had attained tertiary level of education at 1.2 percent (2/162).

Occupation

With regard to employment and service utilisation, majority of the clients, 48.8 percent (79/162) were in the informal sector having their own small businesses and were falling in the low level of orthopaedic service utilisation category.

Other descriptive aspects which were covered, include income, area of residence, health insurance, treatment remark/outcome and social support. Table 3c below shows these findings.

Table 3c: Client Demographic, socioeconomic characteristics (n=162)

Characteristic	Level of Utilisation		Total	P Value
	Low f (%)	**High** f (%)		(Chi-square)
Income				0.681
<K2,500.00	15 (9.3%)	6(3.7%)	21(13.0%)	
K2,600.00 toK3,500.00	45(27.8%)	33(20.4%)	78(48.2%)	
>K3,500.00	22(13.6%)	17(10.5%)	39(24.1%)	
Unknown	14 (8.6%)	10 (6.2%)	24(14.8%)	
Total	**96(59%)**	**66(41%)**	**162(100%)**	
Area of Residence				**0.032**
High density Urban	51 (31.5%)	46(28.4%)	97(59.9%)	
Low density Urban	34 (21%)	11(6.8%)	45(27.8%)	
Rural	11 (6.8%)	9(5.6%)	20(12.4%)	
Total	**96(59%)**	**66(41%)**	**162(100%)**	
Health Insurance				0.253
Have Insurance	15(9.3%)	15 (9.3%)	30 (18.5%)	
Does not have insurance	81(50%)	51(31.5%)	132(81.5)	
Total	**96(59%)**	**66(41%)**	**162(100%)**	
Treatment /Remark				**0.053**
Treated/ better	55(34%)	32(19.8%)	87(54%)	
chronically ill	26(16.1%)	29(17.9%)	55(34%)	
Treated/ not good/died	15(9.3%)	5(3.1%)	20 (12.4%)	
Total	**96(59%)**	**66(41%)**	**162(100%)**	
Social Support				Fisher's
Social welfare	6(3.7%)	4(2.5%)	10 (6.2%)	exact
NGO	14(8.6%)	5 (3.1%)	19(11.7%)	0.090
Church	12(7.1%)	18(11.1%)	30(18.5%)	
Family	64(39.5%)	39(24.1%)	103(63.6%)	
Total	**96(59%)**	**66(41%)**	**162(100%)**	

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.

Table 4: Description of other participants by research tool administered

Research tool administered	Planned	Actual
Questionnaires for health providers	10	8
Semi structured interview guide For parents/guardians	10	10
Focus group discussion guide for the young people (15-24)	10	6
Total	**30**	**24**

Table 4 above shows that 24 out of the planned 30 number of health providers, parents and guardians participated in the study. Other descriptive results are highlighted in the following text below by health service provider, parents and young people respectively.

Demographic and socioeconomic characteristic of the service providers' results indicated that three out of eight service providers were females. The age range of the service providers who filled in the questionnaires was 31to 60 years, and the average age of the service providers was 44.9 years. Six out of the eight service providers were married with children. All of the service providers had attained at least grade 12 and some tertiary level of education. Their professions included orthopaedic surgeons 2/8; orthopaedic nurses 2/8; physiotherapist 1/8, Prosthetists 2/8, and medical social worker 1/8.With regard to the number of years served, 3/8 had served below five years; 1/8 had worked for their organisation between eight to 10 years and 4/8 had served their respective hospitals for more than 10 years.

Remuneration was included as this information is relevant to service use among patients. That is, salaries in instances act as motivation and this is reflected in the attitude towards care for the patients (i.e. equal pay for equal work). The findings indicated all the respondents received well above K2, 500.00 as monthly remuneration. Additionally, various responses were cited for inspiration to engage in orthopaedic services provision. 2/8 mentioned having had great mentors, interaction and noticed lack of expertise. 3/8 said they joined the orthopaedic health services sector as a result of having worked in a similar job elsewhere, service to others and it was a call to duty. 1/8 said they had a passion for their job and 2/8 did not respond to this question. Lastly, the service providers who participated in the study were all Christians.

Then, 3/10 of the parents interviewed were biological fathers of the children, 5/10 were biological mothers of the children and 2/10 were grand mother and aunt respectively. The age range of the parents was from 24- 51 years. The majority of the parents were in the informal sector with average income of K2,954. Additionally, 6/10 parents were from high density residential areas –peri urban, 1/10 was from a rural town and 1/10 was from a low density residential area.

As for the young people who participated in the focus group discussion, four were females aged 17, 15, 21 and 24 respectively. Two were high school students from Da Gama School in Luanshya; one was at a private school in Mazabuka and one had completed school and was a marketer at COMESA Market. The two males in

the FGD were aged 23 and 24. One was a former garden boy in Madras Lusaka, currently not working and the other was a sales representative from Kitwe.

4.2 The Level of Orthopaedic Services Utilisation

Orthopaedic services are delivered in a multitier referral pyramid. Meaning, the lower level structures are many across the country and may 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 in Table 5a:-

Table 5a: * 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 (Table 5a), 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. Congenital deformities/malformations/Anomalies were 16/162(10 percent). Talipes (or CTEV) were 8/162 (5 percent) and Amputees at 9/162(5.6 percent) were also among the top six contributing factors towards musculoskeletal 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.
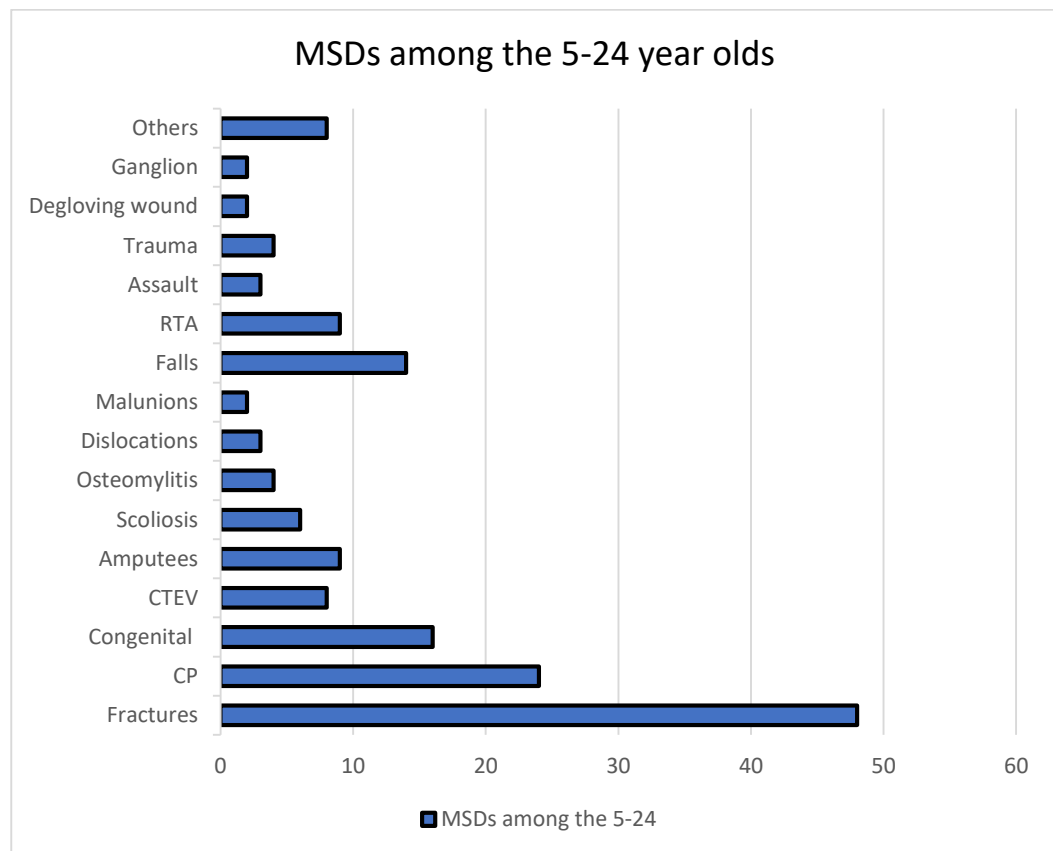

Figure 2. Musculoskeletal Disorders/Conditions among the 5-24 year old studied at UTH and SJPII (n=162)

4.3 Client Demographic, Socioeconomic Characteristics and Utilisation of Orthopaedic Services

In order to determine the influence of client social demographic characteristics on the levels of orthopaedic utilisation at the two hospitals in the study, chi-square tests and multiple logistic regression were done. The results of the inferential tests are shown below.

4.3.1 Chi-square tests results were as follows:-

There was not enough evidence to refute the null hypotheses of no association between the age group to which a client belonged and the level of orthopaedic services utilisation as well as the gender of the participant and the level of orthopaedic services utilisation, with the associated p values of 0.746, and 0.096 respectively. This was way above the set level of significance at 0.05.

With regard to education, some of the values did not meet the chi square assumption of having at least 5 and above frequencies. In this regard, fisher's exact was performed for education status for both those above 12 years and those below 12 years (mother's level of education). The tests done showed no evidence of an association between education status and level of orthopaedic service utilisation, with p values of 0.274 and 0.411 respectively in the table above.

There was no evidence of an association between the level of orthopaedic utilisation and the occupation of the client, with a p-value of 0.430. Additionally, there was no proof of an association between the level of orthopaedic service utilisation and the income of the client, with an associated p- value of 0.681.

The findings in this research were that there was a significant association between the area of residence and the level of orthopaedic service utilisation, p- value of 0.032.

The cross tabulations showed no significant association between the level of use and presence of health insurance, with an associated p- value of 0.253. However, there was an association between Health Insurance and age, at 0.021 significance of the fisher's exact test.

Treatment outcomes /remarks were also included in the cross tabulations. The results show that an association between the level of orthopaedic service utilisation and treatment was borderline, at 0.053 level of significance**.**

Lastly, social support was included. The results show that there was not enough evidence to reject the null hypothesis that there was no relationship between the source of social support and the level of orthopaedic service utilisation, with fisher's exact test with p value of 0.090.

After the chi-square tests were done, multiple logistic regression was conducted to test the strength of the associations and quantify observed differences if any. The final conclusions on determinants relied on the following multiple logistic regression results shown in table 5b and used odds ratios to report the findings.

4.3.2 Multiple Logistic Regression Analysis Results

Table 5b: * Model 2 Univariate and Multiple logistic regression (n=162)

Client demographic and social 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)	0.80
15 -19 years	1.54	(0.61,3.85)	0.36	1.15	(0.38,3.50)	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**

 * Part of the final model

The final model above, Table 5b, shows that age and sex were not determinants of orthopaedic service utilisation among the study group. The results showed wide confidence intervals and p values higher than 0.05 and we failed to reject the null hypothesis of no difference in proportions. On the other hand, this study found that area of residence and health insurance were determinants of orthopaedic services utilisation. Clients from low density residential areas were 86 percent less likely to use orthopaedic services [AOR 0.14; 95% CI 0.05, 0.43] compared to clients from high density residential areas and this difference was highly statistically significant at p< 0.0001. These low density residential areas included urban high cost locations like Kabulonga, Woodlands, Riverside among others around the country.

After controlling for other variables in the model, the results of the multiple logistic regression in this study also show that clients without Health Insurance were 83 percent less likely to use orthopaedic services [AOR 0.17; 95% CI 0.05, 0.55] than clients who had some form of insurance. This difference was statistically significant with the associated p=0.003.

4.4 Enabling Resources, Service Related Characteristics and Utilisation of Orthopaedic Services

This study included a fourth objective meant to determine the extent to which selected service attributes affect utilisation of orthopaedic services among young people 5-24 in Lusaka Zambia. These can be barriers or facilitators of orthopaedic service utilisation among the target population. In order to analyse these aspects,

4.4.1 Effectiveness of Orthopaedic Services

Human resources for orthopedic service provision

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 6 below depicts the mathematical Human resources to population ratio.

Table 6: Human Resources to population ratio

HUMAN RESOURCE	SJP II	UTH	Total	Current crude Human resources to population Ratio	Recommended /comments : The denominator should be based on population requiring the service i.e. 0.5 percent or about 80,000 for Zambia(WHO,2005)
Orthopaedic Surgeons	9	*32	41	1: 390,000	At least 20 surgeons per 100,000 (Mars, n.d.)
Prosthetists/ Orthotists	-	**3	3	1: 5,300,000	On average, at the national referral hospital this is 125 people per category I/II
Orthopaedic Technologist	-	3	3	1:5,300,000	On average, at the national referral hospital this is 125 people per category I/II
Orthopaedic Technicians	2	2	4	1:3,980,000	On average, at the national referral hospital this is 125 people per category I/II
Orthopaedic Nurses	4	5	9	1:1,800,000	no recommendations
Physiotherapists	10	17	27	1: 590,000	-
Physiotherapy technologists	-	19	19	1: 837,000	-
Medical social workers	-	3	3	1:5,300,000	-

Source: Human Resource Superintendent and Annual Reports

*based on the doctors in units visiting clinic 3 and most likely includes general surgeons and trainees

**for the entire country, reports indicated 13, for the 2010 census population of 13,092,666.This report uses the 2016 population projection from the Seventh National Development plan, at 15,900.000 and only includes those actually stationed at the UTH

- Missing information

When service providers were asked to comment on the availability of human resource, majority of the respondents, 3/8 from UTH indicated that there was inadequate human resource for orthopedic services for 5-24 years old and indeed for the whole institution as a national referral Centre. Words to connote this included "severe shortage" "scarcity" and "inadequate" and only 1/8 said they were

fairly available. While all 4/8 of the service providers at St. John Paul II Orthopaedic Mission hospital indicated that human resources for Orthopaedic service provision was good, sufficient. There was however, no medical social worker at the institution during the study year. There was adequate space to work in, except in one instance where a doctor from UTH noted that there was not always enough theatre time for Orthopaedic surgery. Specific tasks cited by the service providers from the two institutions are summarized in table 7.

Table 7: Specific tasks carried out by the service providers

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

Most of the service providers, 7/ 8 service providers were of the view that their institution was big and bureaucratic. On a scale of one to 10, most of the respondents, 4/8 said their positions were at 8 in terms of how well positioned they were to achieve positive outcomes of their intervention. 2/8 indicated being at 10 and 1/8 said at 6 and another 1/8 said at 5.

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 Organisation Guidelines, the vision 2030, the National Health policy and the National Health Strategic plan. A summary of the content analysis is tabulated in Table 8.

Table 8: Content analysis of Orthopaedic Policies/Policy instruments

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	-	✓	✓	✓

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. It was observed that the above mentioned policies talked about the domains in a general manner. Inferences were drawn with regard to orthopaedics if and when non communicable diseases were mentioned and indeed in particular instances such as the national strategic plan (which translated government policy), musculoskeletal conditions feature prominently in the section on top ten causes of morbidity in Zambia for all ages.

Applying the 2005 WHO guidelines to Zambia

The WHO guidelines on the training for Prosthetic and orthotic human resources of 2005 were based on tasks given and the widely acknowledged human resource gap in this area. The 1990 consultation in Alexandria, Egypt resulted in the publication of the first set of guidelines. Then at the request of the world health body in September 2003, advisors from various schools in developing countries met in

Glasgow, Scotland. In this part of research, we present an analysis of their application to the Zambia scenario, with regard to distribution of human resources and services. The calculation took into account the following:-

1. Number requiring devices	0.5 percent of the population		0.5/100*15,900,000 = 80,000
1. Rate of provision	1 device in three years per person		80,000/3 =26,500
2. Number of centres required	National centre		=1
	Provincial centre		=2
	District centre		=10
3. Rates of persons referred per level	Referred to district		=100%
	District to provincial		=20%
	Provincial to national		=30%
4. Weighted number a professional can deal with per year	District centre	1.2*250	=300 per category II
	Provincial centre	1.0*250	=250 per category I/II
	National centre	0.5*250	=125 per category I/II
5. Professional: technician/bench (categoryIII) worker ratio	District centre		1:5
	Provincial centre		1:3
	National centre		1:1

Thus,

Calculation of the number of people requiring devices

Total number	**15,900,000*0.5 /100**	**=**	**79500**
Number of devices per year	79500/3	=	26500
District (10)	26,500 x 0.8	=	21200
Provincial (2)	21,200 x 0.2	=	4240
National (1)	4,240 x 0.3	=	1272
Number of category I and II required			
District (10)	(21,200/300) x10	=	71
Provincial (2)	(4,240/250) x 2	=	17
National (1)	(1,272/125) x1	=	10
Number of category III			
District (10)	(7x5) x 10	=	350
Provincial (2)	(9x3) x 2	=	54
National (1)	(10x1) x 1	=	10
Total required			**512**

Calculations taken to the nearest whole numbers, using the WHO 2005 guidelines

From the above calculations using the guidelines, the total number of human resources required 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).

What does not work well in the provision of Orthopaedic Services

The service providers were also asked in the questionnaire to comment on what does not work well in the provision of orthopaedic services to young clients aged 5 - 24 at the two hospitals. This was meant to find out views regarding other aspects of the services that could have a negative effect on the effectiveness of the services in the area. The responses repeated issues around availability of medical supplies, equipment and policy guidelines; the presence of adequate space, client provider interaction as well as satisfaction with /or safety of service.

While 1/8 respondents did not respond to this question, the rest of the respondents 7/8 noted one of the following respectively: Some musculoskeletal conditions were permanent, at younger ages. If orthopaedic equipment are not available things did not work well. There was inadequate money to take care of the children and their parents; a non-functioning radiological unit, lack of fully equipped operating theatre. Loss to follow up and breaks from treatment and or rehabilitation. They are some appliances which need to be paid for as the materials for making them is expensive and at time parents cannot afford. Lack of funding to run services, lack of support services e.g. rehabilitation facilities; and limited technological systems and materials, poor adherence to the instructions in dressing devices were among the challenges highlighted.

This study also found that there is good client-provider interaction from the two hospitals in this research. The eight service providers from both hospitals knew and could describe the nature of the clients they attended to as being from:-

Low income households, vulnerable socially and economically ……….....2/8
Orthopaedic and trauma clients……………..………………….……... 1/8
Mostly disabled children; are handicapped by not having assistive devices.........2/8
Diverse pathology and background; all ages……………………..………...2/8
All ages and 80% are economically disadvantaged………..………………… 1/8

Client follow up

Regarding the extent to which the hospital was able to track the progress clients made under the different levels of Orthopaedic care, 4/8 service providers in this study indicated to some extent, this was done at the St John Paul II through the outreach programme. Client follow up for the UTH did not involve following clients in their homes after discharge, depended on the ability of the client to come for reviews for those who had been discharged and for those still in the wards, day to day monitoring was done. 1/8 did not comment. 2/8 of the health workers said client follow ups were done to a lager extent and 1/8 of the service providers indicated that progress was difficult to track as there were many instances of loss to follow-up.

4.4.2 Efficiency of Orthopaedic Services

With regard to client waiting time, 2/8 of the service providers noted that they attended to both children and adults. Children were said to be priority because they cry if delayed. While 3/8 service providers from UTH noted that there was no way of measuring client waiting time. Sometimes clients come as early as 05:00 hours in the morning, anticipating to be the first one in line to see the doctor. This was corroborated by parents who when asked if they ever had to wait long to be seen, said yes. 1/8 of the service providers noted that in fact this should be referred to as turnaround time.

Client -provider contact time was said to be adequate at the St John Paul II hospital, especially that most of the conditions were chronic ones from the physiotherapy section and enough staff. It was noted that various types of assessments in this way could be done, both objective and subjective. While at the UTH, the contact time depended on the condition of the patient, the clinic team doing the rounds and the number of patients booked, who were quiet a number on Fridays at clinic three. However, every care was taken to ensure "smooth flow" of patients once the team of relevant experts arrived.

Lastly, only 2/8 of the service providers, all from UTH commented on this. The Orthopaedic surgeon noted: "… Do the people who come here even have a choice? That is the problem of Utilitarian approach to service provision…".Hospital clinic

appointment time/or clinic scheduling timing is a given and not a choice. However, specialists try their best, knowing that there are many entry points for patients with MSDs- especially at the UTH, emergency services and referrals cases are attended to by orthopaedic teams almost immediately they are presented.

4.4.3   Referral systems

Referral systems were defined as the network of organizations collaborating in the provision of orthopaedic services, to the 5-24 year old population in Lusaka, Zambia. Service providers were asked if there was a functional referral network for orthopaedic services for children and young people. 3/8 said no, 4/8 said yes and 1/8 said both yes and no. yes, internally and not with others in the community.

For the St. John Paul II, most of the names of the organisations cited had to do with members participating in the community outreach Programme in addition to referrals from other health facilities while for the UTH referrals were within the health system only i.e. the second level hospitals, clinics and health centres from diverse parts of the country . Specific services referred from and to included:-

- Prevention, care and rehabilitation …………………………………..….….3/8
- Care and rehabilitation ……………………………………………….... 2/8
- Prevention, care rehabilitation, surgical………………………….…….… 1/8
- Rehabilitation and health talk …………………………………….……1/8
- Rehabilitation only …………………………………………..……....1/8

With regard to the number of clients referred, this research could not establish the actual number of clients referred from all the Orthopaedic centers, due to limited data during the study year. The data which was available was for years prior to 2017.

4.4.4   Cost of Orthopaedic Services

The other service related attribute looked at in this research was that of cost. The idea of cost of orthopaedics was defined as the amount spent on the provision of the service and / or the amount that is spent in getting the care required. The responses varied widely. Some of the responses here indicated are:-

Since surgical interventions, physiotherapy, orthotic support were provided, the costs are high, above K15,000=00 but can be as low as below K1,000=00 per person . This was corroborated by the parents who noted that for physiotherapy

sessions, at the SJPII, even at K50 a physiotherapy session was done. The range was way above the options provided in the questionnaire.

The participants above the age of 18 years, especially those between 19 and 24 years of age, visiting the St JPII hospital were considered adults. Their payment was deemed to be of help in covering children's orthopaedic care expenses. Clients above the age of 18 at the hospital under study could pay for the services through insurance claims from Madison, Prudential, and Sancare among others especially for those who were in formal employment. However, insurance claims were not inclusive of assistive devices. Those who could not afford were assisted by family and other organisations.

Cost on the part of the mission hospital was related to the up keep of clients to be offered free services. These costs included, and not limited to, materials for orthotics and prosthetics, transport for outreach, feeding, medication, theatre, beddings and home care training for care givers (St. John Paul II report).

Apart from this, the challenge of costs was also noted in the responses given to the question regarding what does not work well in the provision of orthopaedic services for children and young people between the ages of 5-24 in Lusaka, Zambia.

"Money [inadequate] to take care of these children and their parents" Nurse, St JPII.

"Above 70 percent of funds are spent on children and young people with MSDs" Physiotherapist, St JPII.

The Challenges encountered in the provision of Orthopaedic services are similar to the University Teaching Hospital which provides free services for all the age groups. For the University Teaching Hospital, although admission to the C22 ward was free, most of the service providers asserted that approximately 99 percent of the population that attended the state owned health care facility incurred some form of out of pocket expenditure. The service providers said that most of the money spent by the orthopaedic clients in 2017 was on laboratory X-rays, some type of medication that could not be available and transport. In some instances patients were required to buy medical supplies and disposables i.e. Plaster of Paris bandages, K- wires for those undergoing surgery and also assistive devices if need be.

When asked to comment on the amount or funds the respective hospitals spent on providing services to children and young people with MSDs, 7/8 of the respondents indicated that the costs were huge. Other similar responses in the study which highlighted the cost challenge included that the total cost incurred by the UTH annually was about K400, 000.00. It was noted that given the fact that this was a national referral hospital catering for the entire nation, this funding was inadequate, hence, sometimes clients were required to buy their own materials for them to be treated accordingly.

In order to deal with the expenses needed to provide orthopaedic services to young people 5-24 under study, various mechanisms were said to be in place. The UTH service providers said that there are instances where the private sector comes in to help ameliorate the problems, for instance a Chinese firm renovated an ablution block and the government provided a grant.

There had been a programme in the past by the International Society of the Red Cross and UNHCR to provide low cost prosthetics and orthoses to clients locally and mostly refugees from war torn countries in the southern African region. A project/programme by five miles was also running at UTH. Additionally, there was an agreement between Ottobok and the university teaching hospital/ University of Zambia to train Orthotists and Prosthetists. For the St John Paul II at the time of research, a crowd funding mechanism was running to raise $5,000, about K50, 000.00, towards the extension of the hospital. The total annual budget was reported to be well above K800, 000.00.

In order to have a rough estimate of the cost of the service per person per good treatment outcome, a Simple ratio analysis computation was done:-

Efficiency of orthopaedic services =Costs or inputs divided by output or outcome

Assumptions in our study for calculation of efficiency:-

All things being equal, costs as self-reported above by the service providers covered services during the year, excluding donations, construction works and major medical equipment and salaries. No profits were realised as part of injection into the flow of resources and 70 percent of the total amount was spent on children and young people. The Output/outcome of the service as referring to the number of

clients who visited the hospitals during the year, were treated and better from both hospitals.

Thus, efficiency of orthopaedic services =Costs or inputs divided by output or outcome

Estimated costs= K800, 000.00+K400, 000.00=K1, 200,000.00

$$=70/100* K1, 200,000.00=K840, 000.00$$

Output or outcome= 87 young people who were treated and better

Therefore,   K840, 000.00/87=K 9,655.00 per person. The conclusion is that because the value above is positive, money is not saved.

4.5 Clients' Perceptions and Experiences Regarding Orthopaedic Services

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.

Knowledge helps young people to easily adapt to their 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 they 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/C3

BM 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

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 help 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 they thought motivated 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 (home visit) by a professor from the St John Paul II hospital.

<u>Good Self-rating of health enhanced experiences at health facility</u>

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 along other lines related to functionality, grooming rather than the severity of the child's condition. Good self-rated health after reviews implied satisfaction with the service and reduced parents' perception of threats of discrimination and shame. This 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. Some of the participants from Da Gama School thanked the 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/M

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.

<u>Risks</u>

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.

CHAPTER FIVE: DISCUSSION

5.1 Level of orthopaedic service use

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). Some of the reasons which can be advanced as to why the proportional differences are not statistically significant include that, there were various services involved, each with its own optimal level of use. Although the levels were brought under two possible outcomes, it could be that the outcomes could have been ordinal, with a third category i.e. high, medium and low use. Future studies could consider these.

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).

5 .2 Client demographic and social economic characteristics

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 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 like Kabulonga, riverside among others 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 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 JPII,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 .

5.3 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 scare. 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 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 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.

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 weather 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 is 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.

5.4 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 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 exist on possibility of other conditions occurring alongside musculoskeletal disorders.

CHAPTER SIX: CONCLUSIONS AND RECOMMENDATIONS

6.1 Conclusions

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.

6.2 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 orthopaedics 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 decentralisation 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 orthopaedics 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 utilise 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 Organisation guidelines among other quality measures for the orthopaedic services provided countrywide, using other methods.

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APPENDIX 1

THE UNIVERSITY OF ZAMBIA

DIRECTORATE OF RESEARCH AND POST GRADUATE STUDY

SCHOOL OF PUBLIC HEALTH

STUDY INFORMATION SHEET

TITLE: **DETERMINANTS OF ORTHOPAEDIC SERVICES UTILISATION AMONG YOUNG PEOPLE (5-24) IN LUSAKA, ZAMBIA: A Cross Sectional study of Services at the University Teaching Hospital and The St John Paul II Orthopaedic Mission Hospital**

This is a study to determine the level of Orthopaedic service utilisation and associated factors among young people at the University Teaching Hospital and the St John Paul II Orthopaedic Mission Hospital in Lusaka by Queen Elizabeth Seketi a Student at the University of Zambia. You are being asked to take part in the study because you are either working at any of the above hospitals or you have visited the hospital for an appointment with the Orthopaedic services department, or indeed brought a child to the hospital to access the service.

What is the study about?

The purpose of this cross sectional study is to lean how young people who have challenges with mobility as a result on any condition are using the specialised services at the UTH and/or the St John Paul II Orthopaedic Mission Hospital. In particular the study wishes to learn what affects the ability of children and young people to use the Orthopaedic services.

What will be asked of you?

If you agree to be part of the study, you will be interviewed and /or be part of the group discussion. The interview will include questions about your age, health and wellbeing and your views on the services provided among other views relevant to the topic. The interview will take about 30 minutes while the questionnaire may take about 45 minutes to complete. With your permission, we would also like to tape record the interview. The focus group discussion will take about 50 minutes.

What are the Risks and Benefits?

I do not anticipate any risks to you participating in this study other than those encountered in day to day life. There are no direct costs involved with participation although you may miss up to 45 minutes of work. There are also no direct benefits to you. However, your participation will contribute to a greater awareness of the situation of factors that affect the ability of young people to use specialist services such as Orthopaedic services. My final report will be presented at a fora and copies given to the service providers and your participation will help bring greater attention to the issues facing young people.

What will happen to me if I agree to participate in the study?

After you have answered all the questions on the first section of the consent form, you will be asked to sign or put your thumb print on the consent form. If you are not able to write, you are free to have a friend or someone you trust as a witness. You are not obliged to have someone present. No names just initials will be indicated to help ensure that all your answers remain private.

Do I have to take part?

No. Your participation in this study is voluntary. Should you decide at any time during the interview or discussion that you no longer wish to participate, you are free to withdraw without any problem. If parents / guardians that it may not be in the best interest of their child, they are free to withdraw them from the study at any point. This will not affect any care, review or treatment you or your child will   receive in future.

Will the information that is collected be private?

Yes. Your answers will be confidential. The Records of this study will be kept private .In any sort of report that will be made public, no information that will make it possible for you to be identified will be included. Research records will be kept in locked and only the researcher and the assistant will have access to the file. The audio recordings will be destroyed after transcription, which I anticipate will be within three months of its recording.

You may ask more questions about the study between any times from Monday to Friday. Please contact Seketi Queen Elizabeth on 0966 882111 at Ridgeway campus or the Chairperson, or you can call the Chairperson of the University of Zambia Biomedical Research Ethics Committee at +260211256067.

THE UNIVERSITY OF ZAMBIA

DIRECTORATE OF RESEARCH AND POST GRADUATE STUDY

SCHOOL OF PUBLIC HEALTH

CONSENT FORM (19-24 year olds and the 10 Parents)

TITLE: **DETERMINANTS OF ORTHOPAEDIC SERVICES UTILISATION AMONG YOUNG PEOPLE (5-24) IN LUSAKA, ZAMBIA**

This is a study to determine the level of Orthopaedic service utilisation and associated factors among young people at the University Teaching Hospital and the St John Paul II Orthopaedic Mission Hospital in Lusaka, Zambia by Queen Elizabeth Seketi a Student at the University of Zambia. You are being asked to take part in the study because you are either working at any of the above hospitals or you have visited the hospital for an appointment with the Orthopaedic services department, or indeed brought a child to the hospital to access the service.

Has the above said study been explained to you and you have been given an information sheet concerning the study?   Yes /No

Have you had an opportunity to ask questions and discuss the study   Yes /No

Have you received satisfactory answers to all of your questions?   Yes/ No

_____   _____

Signature of the Participant   Date

_____   _____

Signature of the witness if participant is illiterate   Date

I Confirm that the purpose of the research, the possible risks and benefits have been explained to the participant. All questions have been answered. The participant has agreed to participate in the study.

_____   _____

Signature of the person obtaining consent   Date

APPENDIX 3

THE UNIVERSITY OF ZAMBIA

DIRECTORATE OF RESEARCH AND POST GRADUATE STUDY

SCHOOL OF PUBLIC HEALTH

ASSENT FORM

TITLE: DETERMINANTS OF ORTHOPAEDIC SERVICES UTILISATION AMONG YOUNG PEOPLE (5-24) IN LUSAKA, ZAMBIA

This is a study to determine the level of Orthopaedic service utilisation among young people at the University Teaching Hospital and the St John Paul II Orthopaedic Mission Hospital in Lusaka by Queen Elizabeth Seketi a Student at the University of Zambia. You are being asked to take part in the study because you are either working at any of the above hospitals or you have visited the hospital for an appointment with the Orthopaedic services department, or indeed brought a child to the hospital to access the service.

Has the above said study been explained to you and you have been given an information sheet concerning the study?   Yes /No

Have you had an opportunity to ask questions and discuss the study   Yes /No

Have you received satisfactory answers to all of your questions?   Yes/ No

 Do you agree that your child who is at least five years can be asked questions regarding how they feel about Orthopaedic services they receive at the hospital?   Yes / No

_____   _____

Signature / thumbprint of Parent/ Guardian   Date

_____   _____

Signature of person obtaining assent   Date

THE UNIVERSITY OF ZAMBIA

DIRECTORATE OF RESEARCH AND POST GRADUATE STUDY

SCHOOL OF PUBLIC HEALTH

DATA EXTRACTION CHECKLIST –FROM HOSPITAL DATA BASES AND REPORTS

TITLE: **DETERMINANTS OF ORTHOPAEDIC SERVICE UTILISATION AMONG YOUNG PEOPLE AGED 5-24 YEARS OLD IN ZAMBIA**

This is a study to determine the level of Orthopaedic service utilisation among young people at the University Teaching Hospital and the St John Paul II Orthopaedic Mission Hospital in Lusaka by Queen Elizabeth Seketi a Student at the University of Zambia. In particular the study wishes to learn what affects the ability of young people to use the Orthopaedic services. The following dataset from your data base will therefore go a long way in enhancing the said research:-

A01 Number of hospital visits for MSD per person per year
A02 Type of service a person has used in the last year
A03 Types of MSDs common among children and young children
B01 to B10 Client Socio- Demographic Characteristics
C09 to C11 Service Related factors

APPENDIX 5

SEMI STRUCTURED QUESTIONNAIRE FOR ORTHOPAEDIC

SERVICE PROVIDERS

Questionnaire No:……………….

Organisation: …………………………

Date:……………………………………….

TITLE: **DETERMINANTS OF ORTHOPAEDIC SERVICES**
UTILISATION AMONG YOUNG PEOPLE (5-24) IN LUSAKA

This is a study to determine the level of Orthopaedic service utilisation and associated factors among young people at the University Teaching Hospital and the St John Paul II Orthopaedic Mission Hospital in Lusaka by Queen Elizabeth Seketi a Student at the University of Zambia. In particular the study wishes to learn what affects the ability of young people to use the Orthopaedic services. Your cooperation in filling in this questionnaire will go a long way in enhancing the said research. Tick the appropriate responses and use the spaces provided to answer questions which require some explanation.

	For Admin. use only
SECTION 1: RESPONDENT'S SOCIOECONOMIC DATA	
1. Sex of the Respondent: Female ☐ Male ☐	☐
2. What was your age on your last birthday? …………………	☐
3. Marital Status: Single ☐ Married ☐ Widowed ☐ Divorced ☐	☐
4. How many years of fulltime education did you complete? ☐	
5. Profession………………………………………………………….	☐
6. Position in the organization……………………………………	
7. Income amount: Below K1,000.00 ☐ K1,000.00 to K2,500.00 ☐ Above K2, 500.00 ☐ other, Specify……………	☐
8. How long have you worked for your organization? Below 5 years ☐ 5-7 years ☐ 8-10 years ☐ above 10years ☐	☐
9. What inspired you to engage in Orthopaedic services provision?..	☐
10. What is your religion?..	
11. What linguistic group do you belong to?..	

	For Admin. use only

SECTION 2 SERVICE RELATED FACTORS

1. How would you describe your organisation? Big ☐ Small ☐

2. What is your organisational structure like?...

3. In your Opinion, how well positioned is your position in order to achieve positive outcomes of your intervention on a scale of 1 to 10? (Circle)

Not well positioned   well positioned

1   2   3   4   5   6   7   8   9   10

4. Do you have a strategic plan for Orthopaedic services? Yes ☐ No ☐

If no, when do you intend to have one in place?...

5. Mention any active policy or protocol followed in the Provision of Orthopaedic services

…………………………………………………………………………………

6. Do you think there is enough support concerning the allocation and availability of technologies to reduce barriers to orthopaedic service provision?

   Yes ☐   No ☐

7. What are the values that guide your programming?

…………………………………………………………………………..

8. What is the scope/ coverage of your orthopaedic services? Treatment

Prevention ☐   Care ☐   Rehabilitation ☐   other , specify ☐

……………………………………………………………………………

9. How would you describe the nature of the clients you attend.to?...................

…………………………………………………………………………………

…………………………………………………………………………………

10. Estimate of proportion of children and young clients with MSDs? ☐

Comment on above……………………………………………………………

11. What Specific tasks do you carryout in Orthopaedic service provision?

……………………………………………………………....................................

12. Comment on the availability of the human resource………………..........

13. Is there a functional referral network for Orthopaedic services for children and young people?   Yes ☐   No ☐

If yes, who are the members in this network?..

…………………………………………………………………………………

Comment on TOR, Action plan, secretariat, meetings…………………………

14. Cost of service per person   Below K1,500.00 ☐   K1,500.00 to K3,500.00 ☐   Above K3, 500.00 ☐   other, Specify………………

15. Comment on the amount or funds your organisation spends on providing services to children and young people with MSDs…………………………………………………………………………..
………………………………………………………………………………………
………………………………………………………………………………………

16. What works well in the provision of Orthopaedic services for children and young people?

………………………………………………………………………

………………………………………………………………………

………………………………………………………………………

17. What does not work well in the provision of Orthopaedic services for children and young people?
…………………………………………………………………………
…………………………………………………………………………
…………………………………………………………………………
…………………………………………………………………………
…………………………………………………………………………
…………………………………………………………………………

SECTION 3 CLIENT RELATED FACTORS

18. What do clients say about your services?

…………………………………………………………………………
…………………………………………………………………………

…………………………………………………………………………

19. How do most of the children and young people perceive their disorders?

....

…………………………………………………………………………

20. If the self-rating of health by clients is poor, how do you intervene?
…………………………………………………………………………
…………………………………………………………………………
…………………………………………………………………………

   21. Any other comment?
…………………………………………………………………………
…………………………………………………………………………
…………………………………………………………………………
………………………………………………………

Thank you for your Cooperation!

APPENDIX 6

INTERVIEW GUIDE FOR PARENTS

No:………………

Organisation: …………………………

Date:……………………………………….

TITLE: **DETERMINANTS OF ORTHOPAEDIC SERVICES UTILISATION AMONG YOUNG PEOPLE (5-24) IN LUSAKA, ZAMBIA**

This is a study to determine the level of Orthopaedic service utilisation among young people at the University Teaching Hospital and the St John Paul II Orthopaedic Mission Hospital in Lusaka by Queen Elizabeth Seketi a Student at the University of Zambia. In particular the study wishes to learn what affects the ability of children and young people to use the Orthopaedic services. The following information from you is meant for research.

B01 to B10 Client Socio- Demographic Characteristics Would you please share with me some personal details regarding your child? (age, sex of child, level of education, maternal level of education, insurance)
A01 Would you share with me the number of hospital visits you have made in the last year?
A02 What type of help did you receive?
A03 Do you understand the nature of condition your child has? Probe further If not, are you free to ask the members of staff to explain to you the condition of your child?
C09 to C11 Service Related factors What do you think about the number of staff available to attend to you? Have you ever had to wait long to be seen? Have you ever visited a different hospital apart from this one? If yes, what was your experience there? What helped you to decide where to take your child? Where would you prefer to send your child if they have pain or other condition? Would you share with me on how much you have to spend on your child's medical bill? How do you manage?
Client perceptions and their experiences Negative / positive Response to service; Reasons for acceptability. Probe on Rating of child's health; Benefits ; Risks, Any other comment   Thank you for sharing on these very personal aspects of your experience.

APPENDIX 7

FOCUS GROUP DISCUSSION GUIDE: YOUNG PEOPLE WITH MSDs

(15-24 age group)

Venue: ……………………….

Date of the Discussion:…………………..

Facilitators: ……………………………………….

Participants to fill in background characteristic at Registration

1. Welcome everyone present
2. Opening prayer from participant
3. Participant Introduction
4. Principal Researcher Highlights the Purpose of the discussion

      Some questions to guide the discussion

i. Do you know anything about your condition?
ii. Would you please share with me how you knew about your disability?
iii. What was the situation like before you went to the hospital?
iv. What has changed now? How do you feel about it?
v. What do you think motivates people to go to the hospital?
vi. What issues would you like to address in order to make Orthopaedic services better?
vii. Given a chance to design a programme on Services for children and young people with mobility challenges, what would you add?
viii. Any other comments

5. Facilitators thank participants for their participation
6. Closing prayer

Appendix 8

CONCEPTUAL AND OPERATIONAL DEFINITIONS

The dependent variable was utilisation of orthopaedic services, which was dichotomous, high level of orthopaedic services utilisation and low level of orthopaedic services utilisation. The following shows the indicators for utilisation –number of hospital visits, service use, and nature of MSDs and level of utilisation. The conceptual definitions and the operational definitions also given:-

1.0 Dependent variable: utilisation of orthopaedic services among young people aged 5-24 years old in Zambia.

	Concept	**Conceptual definition**	**Operational definition**
1.	Number of Hospital Visits	The number of times a client visits the hospital	The number of times a participant visits the hospital per year
2.	Service use	Type of Orthopaedic Service used	The type of Orthopaedic Services used by participants per year per respective hospital
3.	Nature of MSD	The type of MSD clients present with	The type of MSD clients present with
4.	Level of utilisation	The use of something	At least one visit to an orthopaedic service versus the optimal level of use per service for a participant. This was binary, high level and low level taking into account 1-3 above.

The Independent variables were two fold, client related and service related. The client related variables were selected from the demographic and socioeconomic characteristics as follows:

2. Independent variables

A. Client demographic and socio economic characteristics

1	Age	The number of years someone has ever lived	Age at last birthday
2	Sex	biologically determined differences between	Being male or female

		women and men that are universal	
3	Level of Education	Number of years spent in Formal schooling	Number of years spent in Formal schooling
4	*If child below 12, Mother's education status	Number of years mother spent in Formal schooling	Number of years mother spent in Formal schooling
5	Occupation *If child, Father's Occupation	Source of livelihood	Employment status
6	Income	The amount of earnings	The amount of earnings
7	Area of residence	Where someone resides	Where the participant resides
8	Health Insurance	Coverage that pays benefits as a result of sickness or injury	Having a medical scheme with a hospital
9	Treatment outcome	The result of orthopaedic care a client receives	The status of a client's condition after receiving care for MSDs
10	Social support/ Other source of support for health care	Individual and /or organisational support for Orthopaedic care	Individual and /or organisational support for Orthopaedic care

3. **Independent variables**

B. **Enabling characteristics and service related factors/indicators**

	Cost effectiveness	The ability to have good outputs/outcomes given a cost	The cost of service per client with indicators of good treatment outcomes
	Availability Of human resources	number of staff available per population	number of staff available per population per staff category
	Referral systems	An organised coordination system for Orthopaedic service	Partners collaborating in taking care of the needs of clients
	Client follow up	The capability of the hospital to track clients under health care	The extent to which the organisation had the ability to track clients under the

		different levels of Orthopaedic care
Orthopaedic service guidelines use	Rules, strategies and plans for guiding Orthopaedic service implementation being followed	The extent to which Rules, strategies and plans available for guiding Orthopaedic service implementation were being followed

Clients' perceptions were also studied. The following were the conceptual and operational definitions of the qualitative variables:-

Independent variable -Client Perceptions (qualitative component)

	Conceptual definition	Operational definition
Perceptions	Views and opinions	Views showing attitude/response towards services
Self-rating of health	The way a participant thinks about their state of health	The way a participant thought about their state of health
Benefits of coming to the hospital	Improved outcomes as a result of Orthopaedic service utilisation	What the participant felt and /or thought had been a good change in their situation as a result of using orthopaedic services
Risks	Non difference and /or no improvement in the outcome of orthopaedic Service use	What the participant felt had been a bad change in their situation as a result of using orthopaedic services
Any other comment	Any other view a respondent might hold	Any other view a respondent might hold

APPENDIX 9: FIRST MULTIPLE LOGISTIC REGRESSION TABLE

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	0.91	(0.32,2.54)	0.85
15 -19 years	1.54	(0.61,3.85)	0.36	1.1	(0.15,8.26)	0.93
20 -24 years	1.47	(0.53,4.04)	0.46	0.83	(0.13,5.14)	0.84
Sex						
Male	**Ref**			Ref		
Female	1.72	(0.91,3.25)	0.1	1.25	(0.55,2.85)	0.6
Education (12yrs and Above)						
Primary	Ref			Ref		
Secondary	1.6	(0.56,4.67)	0.38	0.91	(0.21,4.00)	0.91
Tertiary	8	(0.79,80.4)	0.07	7.3	(0.48, 111)	0.15
Non Applicable	1.3	(0.59,3.08)	0.48	1.24	(0.33,4.63)	0.75
Mother's Level of Education (Below 12yrs)						
Non Applicable	Ref			Ref		
Primary	0.59	(0.31,1.13)	0.12	0.74	(0.25,2.21)	0.59
Secondary	0.44	(0.08,2.42)	0.35	0.4	(0.05,3.46)	0.4
Tertiary	0.74	(0.12,4.67)	0.75	1.64	(0.15,17.9)	0.69
Occupation						
Informal	Ref			Ref		
Formal	1.4	(0.63,2.98)	0.53			
Income						
Unknown	Ref			**Ref**		
Below K2,500.00	1.83	(0.64,5.23)	0.26	1.6	(0.41,6.10)	0.51
K2,600.00-K3,500.00	1.93	(0.62,6.03)	0.26	2.6	(0.39,17.8)	0.32
Above K3,500.00	1.79	(0.51,6.21)	0.36	4.6	(0.53,3.36)	0.17
Area of Residence						
High density Urban	Ref			Ref		
Low Density Urban	0.36	(0.16,0.79)	0.01	0.13	(0.04, 0.48	0.002
Rural	0.91	(0.34,2.39)	0.84	0.88	(0.23,3.36)	0.85
Health Insurance						
Have Health Insurance	Ref			ref		
Does not have Health Insurance	0.63	(0.28,1.40)	0.26	0.26	(0.05,1.21)	0.09
Treatment						
Assessment /ongoing/yet to see	Ref			Ref		
Treated/better	0.52	(0.26,1.04)	0.06	0.46	(0.14,1.46)	0.19
Treated/not good	0.3	(0.10,0.94)	0.04	0.37	(0.08,1.75)	0.21
Other Source of support						
Social Welfare	Ref					
NGO	0.54	(0.11,2.72)	0.45	0.23	(0.02,3.40)	0.29
Church	2.25	(0.52,9.70)	0.28	1.72	(0.13,22.6)	0.68