PERCEPTIONS REGARDING MEDICAL MANAGEMENT OF CLUBFOOT IN KENYA

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DECLARATION

I declare that this thesis **"Perceptions regarding medical management of clubfoot in Kenya"** is my work, and has not been submitted for any other degree or examination in any other university. Complete referencing has been made and acknowledged for all sources used and or quoted.

Naomi W. Kingau

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DEDICATION

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KEYWORDS

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ABSTRACT

Clubfoot is one of the congenital and structural conditions that lead to physical impairment in children globally. Service providers have different perceptions on the various methods of management of clubfoot. This has led to adoption of various approaches of management of clubfoot. Although there is a wide range of experiences of parents/caregivers of children with clubfoot regarding medical management of this condition, there is no documented data on these experiences. The study therefore **aimed** at exploring the perceptions regarding the medical management of clubfoot in Kenya. The **objectives** of this study were to explore the service providers and parents/caregivers perceptions on the use of the different methods of medical management of clubfoot; explore the process followed before and after the commencement of management from the service providers and parents/caregivers when using surgical and conservative methods of management as well as exploring the barriers and enabling factors that the service providers experience during the management of clubfoot. **Methodology**: This study was conducted at talipes clinic of Mbagathi District Hospital, Kenyatta National Hospital and Kijabe Mission Hospital in Kenya. The study utilized a qualitative design and purposive convenient sampling was utilized to recruit participants. Twenty participants were recruited; the sample consisted of ten parents/caregivers of children with clubfoot and ten service providers. Semi-structured interview and probes were used for data collection, interviews were audiotaped and a research assistant took notes, data was collected until saturation. Data was transcribed verbatim and analyzed by thematic-content analysis. The **results** indicated that most of the service providers perceived Ponseti method as the most effective method of clubfoot management with early intervention. Surgery was found to be the second most utilized method which was indicated for complex and neglected clubfoot. The factors that affected service

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providers in clubfoot management included: Shortage of trained staff in Ponseti management, missed diagnosis at birth; poor referral system and poor compliance with treatment appointments. The factors that affected parents/caregivers compliance with the treatment regime included: (i) unaffordable transport expenses; (ii) long distance; (iii) little or no social/family support; culture/tradition and stigmatization while compliance was facilitated by (i) good communication between the parents/caregivers and the clinician; (ii) availability of free services (iii) social/ family support. **Conclusion:** The current study concluded that medical management of clubfoot was a success while majority of parents/caregivers agreed that they were faced with several challenges as fore mentioned which affected the outcome. **Recommendation:** the study therefore recommends the need to empower the community and service provider with knowledge on clubfoot and its management. There is also need for decentralisation of services and increase the number of health care givers in health facilities who are trained in clubfoot management. Finally physiotherapy academic institutions need to put emphasis on teaching clubfoot management in order to produce effective service providers.

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CHAPTER ONE

INTRODUCTION

1.0. INTRODUCTION

The aim of this chapter is to provide contextual information on the perception of service providers and parents/caregivers regarding medical management of clubfoot. The chapter will further highlight some important issues that need to be considered during management of clubfoot. Lastly the aim, objectives and the significance of the study are presented.

1.1. BACKGROUND

In developed and developing countries, disability in childhood remains a challenge (Pirani et al., 2009). Linked to this disability is increase in the prevalence of infants born with congenital clubfoot (Matthew, Dobbs, Nunley & Shoenecker, 2006).

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Clubfoot is a birth defect of the lower limb which present with smaller calf muscles, adductus of the forefoot, cavus, varus of the heel and equinus of the foot (Morcuende, 2006). Clubfoot deformity can be unilateral or bilateral (Barry, 2005)

Research conducted in the United State shows that the prevalence of clubfoot varies between 0.64 and 6.8 per 1000 live births worldwide (Baker, Chesney, Miedzybrodzka & Maffuli, 2003) while a study by Dietz, Tyler and Leary (2009) indicated that East Africa, Central Africa and Polynesia presents the highest prevalence of clubfoot of 8 per 1000 live births.

In Africa, for example Malawi, the prevalence of clubfoot is approximated to be 2 to 3 per 1000 live births (Tindall, Steinlechner, Lavy, Mannion & Mkandawire, 2005) while in Uganda the prevalence of clubfoot is estimated to be at 1.2 per 1000 live birth (Pirani et al., 2009).

Clubfoot is a condition that presents at child birth (Zeifang, Carstens, Schneider & Thomsen, 2005). This condition can be effectively managed by use of conservative or surgical methods (Ponseti, 2005). However, when left untreated or inadequetly managed, clubfoot causes impairement and deformities of the foot (Dobbs, Carey, Morcuende & Ponseti, 2003), thus affecting an individual's gait leading to disability (Pirani et al., 2009). Untreated or inadequetly managed clubfoot is one of the primary causes of physical disability in the world affecting 1 in every 750 children (Carney & Cobutn, 2005). Children with this disability live with the pain and humiliation of a serious physical disability (Pirani et al., 2009)

Disability due clubfoot threatens a person's potential productivity (Pirani et al., 2009), resulting to dependancy. This has a great impact on an individual's social economic status that can significantly reduce the standard of living for the family and the community at large. In addition, the structural differences caused by clubfoot causes social stigma and affect the child psychologically (Bedford, 2009).

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Management of clubfoot with a major aim of correcting the impairment is of significant value. This reduces activity limitation and facilitates participation (Peterson, 2005). These services are a major component of primary health care (WHO, 2004), where service providers work principally within a biopsychosocial paradigm to manage clubfoot (Ireland, 2003). The biopsychosocial approach enables the parents/caregivers of children with clubfoot to participate in setting the management goals while the healthcare providers employ evidence based treatment strategies, i.e. "the conscientious, explicit and judicious use of current best evidence in clubfoot management. This involves integrating individual health care provider's clinical experience with the best available external clinical evidence from scientific research." (Rorrell-Carrio, Suchman & Epstein, 2004).

Management of clubfoot embraces the surgical and conservative methods (Dietz, Tyler, Leary & Damiano, 2009). Surgical intervention involves posterior release and posterolateral and posteromedial release (Dietz et al., 2009) while conservative management involves manipulation and casting serial (Ponseti et al., 2009). Surgical intervention is best suited for late diagnosis and complex clubfoot (Sureh, Ahmed & Sharma, 2003) while conservative method is advocated as the first line of treatment for early intervention (Dobbs et al., 2004; Morcuende et al., 2004). Complex clubfoot is clubfoot that does not respond to standard treatment protocol of conservative management (Ponseti et al., 2006).

There are several factors that determine which method is to be utilized by the service providers. These factors affect the outcome of management either negatively or positively. Lack of resources, poor distribution of health facilities and shortage of health care professionals are some of the factors that affect clubfoot management in developing countries (Sloper & Turner, 2006). The institutions that exist for clubfoot management are more often located in urban areas and are therefore inaccessible to people living in rural areas due to poor communication, travel expenses and inadequate awareness (Scott & Evans, 1997).

Rehabilitation professionals such as physiotherapists are crucial members of the clubfoot management team both in developed and developing countries (Kampa et al., 2008; Shack & Eastwood, 2006). Physiotherapists manage the clubfoot deformity, teach parents/caregivers about clubfoot, the treatment process and the expected outcome (Ireland, 2003).

Similarly, parents/caregivers are important members of the clubfoot management team (Shack & Eastwood, 2006). Active participation of parents/caregivers during the management process through compliance to the expected requirements is imperative for achieving good results (Shack & Eastwood, 2006). Without adherence, the treatment goals cannot be achieved, resulting in

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poor results (Howe, Rochester, Neil, Skelton & Bellinger, 2011). Adherence to treatment involves following treatment instructions, accepting restriction and attending to all doctors' appointment.

Despite the great work in management of clubfoot, there is controversy related to the different methods of clubfoot treatment (Heilig, Matern, Rosenzweig & Bennett, 2003; Vitale et al., 2005). According to Roye, Vitale, Gelinjs and Roye (2001) regarding perceptions and experiences in surgical management of clubfoot in developed countries, there is uncertainity concerning indication, type of surgical methods and long-term result of the treatment. Some of the service providers perceive that this uncertainity is as a result of lack of a standardized and valid technique of assessing outcomes in clubfoot treatment (Roye et al., 2001). On the contrary, there is paucity of litreature on parents/caregivers on medical management of clubfoot. It is therefore important to understand how the service providers manage these children, their perceptions regarding various methods of management and the potential barriers they encounter during management of clubfoot. It is of great importance likewise to explore the experiences of the parents/caregivers during clubfoot management period. This will help to identify factors that may facilitate or hamper the outcome of clubfoot management.

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1.2. PROBLEM STATEMENT

Service providers are using the surgical and conservative methods of management of clubfoot at talipes clinic in Nairobi, Kenya. Review of medical records of 2009 at the hospital indicated that there was an increase in neglected, complex or inadequately managed clubfoot. Neglected clubfoot is clubfoot that has not received any treatment and is over two years; inadequately managed clubfoot is clubfoot that never completed the treatment regime and complex clubfoot is clubfoot that does not respond to standard treatment protocol (Ponseti et al., 2006). It was seen

that five out of thirty six patients managed in a month had complex or inadequately managed clubfoot. This had led to the increased cases of complex clubfoot and the physical disability related to clubfoot. The perceptions regarding different approaches used in clubfoot management by the service providers and the patients/caregivers compliance to treatment regime could be the hindrance to the expected outcome (Dobbs et al ., 2004).

1.3. MOTIVATION FOR THE STUDY

The motivation came from the researcher's experience while working as a physiotherapist in Machakos District Hospital. The researcher worked at the talipes clinic where few of the clients presented with neglected, complex and inadequately managed clubfoot. In her experience, she encountered various challenges in management of clubfoot. Some of the barriers included poor management and missed diagnosis of clubfoot by the traditional birth attendant, poor adherence to treatment by the parents/caregivers, unequal distribution of health caregivers, lack of awareness at the community level, cultural beliefs and inaccessible health facilities. Similarly, she found that the service providers were using different approaches to manage clubfoot. This led to some of the children recovering fully and would be discharged from the clinic after four years. Contrary to this, poorly managed or misdiagnosed children ended up with complications that were difficult to manage, some of those complications included children walking on the lateral aspect of the foot as they grew up. Furthermore, the affected children got pain, joint stiffness around the ankle joint and wobbling gait patterns.

Therefore, the researcher was inspired to embark on this study in order to understand the perceptions of the service providers and parents/caregivers on the different methods used to manage clubfoot and parents/caregivers experiences during clubfoot management.

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1.4. RESEARCH QUESTION

What are the perceptions of both service providers and parents/caregivers regarding medical management of clubfoot in Kenya?

1.5. AIM

The aim of the study was to explore the perceptions of service providers and experiences of parents/caregivers regarding medical management of clubfoot at three talipes clinics in Kenya.

1.6. OBJECTIVES

I. To explore the service providers and parents/caregivers perceptions of the use of the different methods of medical management of clubfoot.

II. To explore the processes followed before actual management commences and after management from the service providers and parents/caregivers when using the surgical and conservative methods of management.

III. To explore the barriers and the enabling factors that the service providers experience during management of clubfoot.

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1.7. SIGNIFICANCE

The aim of physiotherapy in clubfoot management is to evade activity limitation and improve participation amongst children with neglected clubfoot and complex clubfoot. The results of this study may facilitate increase in the awareness on the Ponseti method of management of clubfoot amongst the service providers, at the three facilities and the country at large. It may also enlighten the parents/caregivers on the importance of compliance with treatment requirements. Similarly it may also be used in organization and execution of awareness programs at the community level about clubfoot and its treatment by Clubfoot Care Kenya in the country.

Furthermore, the results of the study may be used in the Kenya Medical Training College School of Physiotherapy, the University of Nairobi, School of Medicine and Moi University Medical School to shed light on areas that may need attention in management of clubfoot and in the field of paediatrics. Finally the results could be of value to researchers intending to take up additional studies on management of clubfoot.

1.8. DEFINITION OF TERMS

In this study, namely, perceptions regarding medical management of clubfoot at a District, National and a Mission hospital in Kenya the terminologies utilized are defined below.

Service provider

In this study, the term 'service providers' refers to the health workers who are involved in management of clubfoot at the health facilities. Any person connected with the treatment of clubfoot with skills acquired through learning (Oxford Advanced learner's Dictionary, 2002). These includes; Orthopaedic surgeons, physiotherapists, occupational therapist, counsellors, orthopaedic technologist and nurses.

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Medical management

Medical management of clubfoot as used in this study is defined as the treatment of clubfoot at the health facilities by service providers who have skills acquired through training (Oxford Advanced learner's Dictionary, 2008). This can either be the use of the conservative methods (Ponseti method, the French method, kite/traditional method) or the surgical method (Dobbs et al., 2000; Richards et al., 2005; Ponseti et al., 2006)

Congenital

This refers to a condition that a child is born with (Opitz, 2011)

Clubfoot

This is a birth defect of the lower limb presenting with smaller muscles of the posterior lower limb, foot adductus, varus of the heel and foot in plantar flexion (Morcuende, 2006).

Rehabilitation

This refers to all actions meant to minimizing the influence of disability to an individual, facilitating independence, social incorporation and improving quality of life. Rehabilitation may include actions to re-establish functions, improve function or reduce functional restriction (World Health Organization, 2002).

Plaster cast

This refers to a covering made of calcium sulphate and is usually mixed with water. It hardens when dry. Its main function is to restrain body parts such as a fracture for a period of time (Docker, Lewthwaite & Kiely, 2007).

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Foot abduction braces

This brace in an open toe boots attached to a fixed/adjustable metal bar (Ponseti, 2005). The abduction braces are worn during the second stage of management of clubfoot using the conservative method. The braces are used to immobilize the correction achieved during casting phase (Ponseti, 2005)

Compliance

Compliance with clubfoot treatment is the capability of the parent/caregiver to attend clinic every one or two weeks for management during the casting period for 4 to 8 weeks (Ponseti,

2003). It also refers to the adherence to bracing that follows casting up until the child is 4 years of age (Ponseti, 2003)

Parent and caregiver

In the current study, 'parent' refers to the child's birth parent while 'caregiver' refers to any additional care takers for example aunts (Oxford Advanced learner's Dictionary, 2008).

Care clubfoot Kenya (CCK).

This is a non governmental organisation that facilitates management of clubfoot in 37 clinics in Kenya. Their head offices are at Kijabe Mission Hospital. At Kijabe Mission Hospital, they have set an institution where all the surgical cases are referred for further management (Cure International, 2011).

Tenotomy

In this study tenotomy is a surgical act which involves a complete cut of the tendoachillies. The achilles tenotomy is an integral part of Ponseti management of clubfoot. Tenotomy is necessary because the achilles tendon, unlike the ligaments of the foot, is made up of thick, non-stretchable fibres (Scher, Feldman, van Bosse, Sala & Lehman, 2005).

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1.9. OUTLINE OF THE THESIS

Chapter one describes clubfoot generally, discusses the definition of the clubfoot and its contribution to physical disability. It further contextualizes the importance of the current study, problem statement, the significance of the study and the aims, objectives of the study and finally the interpretations of terms used in clubfoot management.

In **Chapter two**, the literature review highlights essential issues that inform the current study, prevalence, causes, diagnosis and management of clubfoot. It further highlights the barriers and

facilitators and how these barriers and facilitators affect provision of services and the compliance to treatment regime by the parents/caregivers. Finally, the review of the perceptions on clubfoot and other disabling condition in pediatrics are discussed.

Chapter three discusses the methodological issues used in the study, including; study setting, population and sampling, study design and instruments used, methods of data collections and all procedures employed to complete this research. It further discusses how data was analyzed and the ethical issues considered during the research.

Chapter four presents a brief description of the main results from the study. The social demographic information of the service providers and parents/caregivers at the three facilities, perceptions regarding clubfoot management by the service providers and the parents/caregivers and the management processes. In addition, the chapter presents the barriers and facilitators encountered by the service providers and the parents/caregivers during clubfoot management. Also presented in this chapter is the interpretation of the current study and compared with similar studies as per the reviewed literature.

The **final chapter** is the summary of the study, which presents the conclusive information about the study, it further discusses strengths of the study and finally the chapter ends with study limitations and recommendations from the research. The chapter provides suggestions for further work or research in this area of the current study.

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CHAPTER TWO

LITERATURE REVIEW

2.0. INTRODUCTION

This chapter presents a narrative review of the literature on clubfoot as a condition and its medical management. It gives a summary of the prevalence of clubfoot and the proposed causes. Further, literature expounds on the procedures of different approaches in clubfoot management and the advantages and disadvantages of each intervention. Also covered are the service providers' perceptions, their various roles in management of clubfoot as well as the parents/caregivers and their perceptions' regarding medical management of clubfoot. The literature defines barriers and facilitators from findings of previous studies encountered in the course of management of clubfoot by the service providers and parents/caregivers and its relevance to treatment.

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2.1. LITERATURE REVIEW METHOD AND SEARCH STRATEGY

Literature review gives an account of the accessible as well as available information (Jesson & Lacey (2006). It involves the evaluation of facts aimed at reviewing current knowledge including fundamental findings as well theoretical and methodological contributions to the phenomenon under investigation. Literature review includes both published and unpublished documents (Da Silveiraa, Borenstein & Fogliatto, 2001). In the current study, search approaches included the use of the following key words: "clubfoot", "conservative management", "surgical intervention", "Ponseti", "experiences" "complication", "management", "barriers" "knowledge", "facilitators", "attitudes" and "beliefs". Sources of information included books, journal, and websites in addition to abstracts. EBSCO host and Google scholar were also utilized as exploration tools.

The following data bases were involved; Science Direct, Medical Literature online (MEDLINE), Cumulative Index to Nursing and Allied Health Literature (CINAHL), Master File Premier, Psychology Information (PsycINFO), Health Source-Consumer Edition, Health Source: Nursing/Academic Edition, AltaVista, Academic Search Premier and Public Medline (PubMed).

2.2. PREVALENCE OF CLUBFOOT

In a study conducted in United States, it was found that clubfoot affects 1 in 1000 live births globally (Alvado et al., 2011). Similarly, studies conducted in Hawaiian and Maori (New Zealand) estimate the prevalence of clubfoot to be between 6.5 to 7 per 1000 live births (Kruse, Dobbs & Grurnett, 2008) with higher prevalence of male to female in the ratio of 2:1 (Moorth et al., 2005). Additionally, a study by Baker et al. (2003) estimated the prevalence of clubfoot to be 2.57 per 1000 live births in the United States. Likewise, Parker et al. (2009) indicated that the prevalence of clubfoot among african american was 1.14 per 1000 live births.

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The three findings of prevalence of clubfoot in America were varying, it is suggested that the worldwide discrepancy in prevalence of clubfoot appear as a result of variances in race, ethnic background, people under investigation and area of study (Roye & Roye, 2002).

Studies done in other countries such as Asia indicate a prevalence of about 0.6 in every 1000 live births (Macnicol, 2003) and a prevalence of as high as 6 per 1000 live births is reported among pacific Islanders (Macnicol, 2003). Additionally, Carey, Bower, Mylvaganam and Rouse (2003) in their study found a prevalence of 1.25 per 1000 live births in Australia while the aborigine population had a prevalence of 3.5 per 1000 live births. In their findings, males were affected four times more than the females. Similarly, the prevalence of clubfoot was reported to be at 1

per 1000 live births in Sweden (Europe) while Hungary was found to be approximately 3.41 per 1000 births (Chesney, Barker & Maffulli, 2010).

There is paucity of information on prevalence of clubfoot in Africa. However, a few countries where research has been conducted in Africa includes; South Africa, Uganda and Zimbabwe. A study by Ballantyne and Macnicol (2002) reported that the prevalence of clubfoot among black children in South African is 3.5 per 1000 live births while in Zimbabwe the prevalence of clubfoot is indicated to be 0.9 per 1000 live births (Madzivire, Useh, Mashegede & Siziya, 2002). Additionally, the prevalence of clubfoot in Uganda was estimated to be between 2 to 4 per 1000 live births (Mathias, Konde-Lule, Waiswa, Naddumba & Pirani, 2010). However, the authors argue that the number of children with clubfoot in Uganda could be higher than the reported figure since most children are not treated hence under reporting (Mathias et al., 2010).

It is clearly seen that out of the five continents, Africa has the highest prevalence in clubfoot. The high prevalence in Africa is suggested to be due to the race and genetical composition (Baker et al., 2003). This is also consistent with what has been found in the United States where Americans of African origin have a higher prevalence than the whites (Baker et al., 2003).

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80% of children with disability in world live in third world countries (Baker et al., 2003). Nevertheless, little is known about clubfoot that contributes to disability in these countries (Shawky, Abalkhail & Soliman, 2002). Similarly, the setting of the current study has no documentation available on the prevalence of clubfoot.

2.3. CAUSES OF CLUBFOOT

Epidemiological studies on clubfoot indicate that the main cause of clubfoot is unknown (Chapman et al., 2000; Roye & Roye, 2002). A combination of environment (Baker et al., 2003) and genetic (Dundar et al., 2009; Alvado et al., 2011) are suggested as the main causes of

clubfoot deformity. The environmental factors include the intrauterine environment during pregnancy which includes abnormal foetal positioning, uterine pressure, congenital constriction band, temperature change, un-stretched uterus and placenta insufficiency (Hart, Grottkau, Rebello & Albright, 2005).

According to Roye and Roye (2002) and Morcuende (2006), foetal positioning, congenital constriction band, un-stretched uterus and placenta insufficiency may result with poor positioning in the uterus. This might medially rotate and plantar flex the foot. The plantar flexion is reported to cause some of the articulating surface of the talus to lie outside the navicular joint (Ponseti, 2003). The articulating surface grows abnormally since it is poorly joined with the rest of the articulating surfaces (Ponseti, 2003). Slow growth occurs anterior of the talus and normal growth take effect medially, which joins with the subluxed navicular bone (Dietz, 2002). The difference in growth on the talus head pulls the calcaneus into abduction. Additionally, the spring ligament, deltoid ligaments and the posterior tibialis tendon suffers fibrosis and hence shortening leading to foot inversion and adduction (Ponseti, 2003).

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The genetical factor is linked to a defect in genetical composition of the chromosomes which can be inherited (Dietz, 2002; Alvado et al., 2011). Similarly, a study by Chapman et al. (2000) reported that one main gene controls the clubfoot deformity. The authors suggested that the likelihood of carriers of the gene predisposing to clubfoot is adequately high in families with multiple affected members. Studies by Staheli (2009) indicated that in families where one parent has clubfoot, there are 3- 4% chance that children from this family will also be affected while chances are 30% when both parents are affected.

Clubfoot could also exist with other musculoskeletal disorders, for example, in arthrogryposis, myelodysplasia, and myelomeningicele (Hart et al., 2005).

2.4. DIAGNOSIS OF CLUBFOOT

The structural nature of clubfoot enables easy identification at birth by either traditional birth attendants or health care providers in public and private health facilities (Konde-Lule et al., 2005). Additionally, parents/caregivers can identify the condition during their routine observation of the infant (Seedat, Stein, Berk & Wilson, 2002). However, a few service providers do not diagnose or ignore this condition at birth (Konde-Lule et al., 2005).

Identification of the problem is the first step in management process; diagnosis is followed by assessment and treatment (Bussing, Zima, Gary & Garvan, 2003). Studies show that early diagnosis of the condition particularly in paediatrics defines the management and outcome of management (Salako et al., 2001).

2.5. MANAGEMENT OF CLUBFOOT

Various interventions are used in medical management of clubfoot. These methods are surgical intervention (Dietz, Tyler, Leary & Damiano, 2009) and conservative management (non-surgical) (Pirani, 2009). The main aim of management is to address the impairment, prevent activity limitations and participation restrictions (Dobbs, Rudzki, Purcell & Walton, 2004).

2.5.1. Conservative Management

The treatments of clubfoot in the past consisted of different ways such as manipulation, splinting and surgical interventions, but none of these methods were globally recognized (Roye & Roye, 2002). However, after many studies on clubfoot management, there is consensus that the first line of management of clubfoot should be conservative (Dobbs et al., 2004; Morcuende et al., 2004; Colburn & Williams, 2003).

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Conservative methods have progressed from previous management of the deformity by use of soft tissue manipulation in new-borns to splinting in early childhood and adults using special shoes (Pandey & Pandey 2003). Similarly, methods of foot immobilization have also advanced from using egg yolk covering of the foot to adhesive strappings, plaster of Paris and surgical boots (Pandey & Pandey, 2003). However, researchers have come up with several methods proven to be effective in clubfoot management.

The main conservative methods include: the French method (Richards et al., 2005); the Kites method (Roye & Roye, 2002; Noonan & Richards, 2003) and the Ponseti method (Colburn & Williams, 2003; Dobbs et al., 2004; Judd, 2004; Frick, 2005; Mocuende et al., 2005).

It is reported that serial casting and immobilization are the major conservative procedures used in North America. On the contrary, health care givers in Europe use passive mobilization without the use of immobilisation by plaster castings (Roye & Roye, 2002; Dobbs et al., 2004).

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2.5.1.1. The Ponseti method

Ponseti method is the latest of the conservative methods of clubfoot management. This method was discovered after the Kite method failed to correct clubfoot fully. Ponseti improved Kite's technique by using external rotation of the foot to correct adduction. It utilized a long cast from toes up to the groin; reduced the equinus by use of tenotomy and used abduction braces to maintain correction (Ponseti, 2005)

According to Ponseti (2005), treatment of clubfoot is divided into three phases. The first phase entails the assessment of the foot and the associated deformities. This is done by use of Pirani score (Pirani et al., 2009). Pirani scoring is useful in classifying the clubfoot, assessing improvement, assessing relapse and establishing the prognosis (Pirani et al., 2009). The Pirani score shows the severity of the deformity and consecutive scores helps to monitor progress

(Pirani et al., 2009). The Pirani scale utilizes six scientific symbols to measure severity of each section of the malformation. The components assessed are the posterior crease, empty heel, rigid equinus, head of talus, curvature lateral border and medial crease. Each constituent is scored as 0 (normal), 0.5 (slightly abnormal) or 1 (severely abnormal) which are then documented. With Ponseti intervention, the scores at any stage of management gives the information as to if the deformity is correcting or not, and the level of improvement of every constituent of the clubfoot. The score likewise assist in deciding when to perform a tenotomy or start with braces (Staheli, 2009; Judd, 2004)

Studies by Judd (2004) and Morcuende et al. (2004) indicate that the second stage involves correction of the deformity. During this stage, the deformity is corrected by manipulation, serial casting and tenotomy. Treatment includes steady correction of the deformity, by stretching of fibrotic structures, followed by serial casting to immobilize the correction. Judd (2004); Morcuende et al. (2004); Frick (2005) and Scher (2005) recommend that the procedure should be done weekly for five to eight weeks depending on severity of the feet. At the end of eight weeks, children with residue rigid equinus undergo a minor surgical procedure (tenotomy) (Ponseti, 2008). The cast is applied and stays for three weeks (Pirani et al., 2009).

The third phase is the maintenance phase. At the end of serial casting or casting after tenotomy, the foot is abducted between 60 and 70 degrees (Mocuende et al., 2005). Ponseti management then embraces the use of brace to maintain the achieved correction as well as prevent relapse of the deformity. The child uses the foot-abduction braces (steenbeek foot abduction braces). According to Morcuende (2006), the baby is required to use the braces for 24 hours for three months followed by wearing the braces for two to four hours during the day and twelve hours in

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the night to a total of fourteen to sixteen hours in twenty four hours until the child is four years of age (Pirani et al., 2009; Ponseti et al., 2003).

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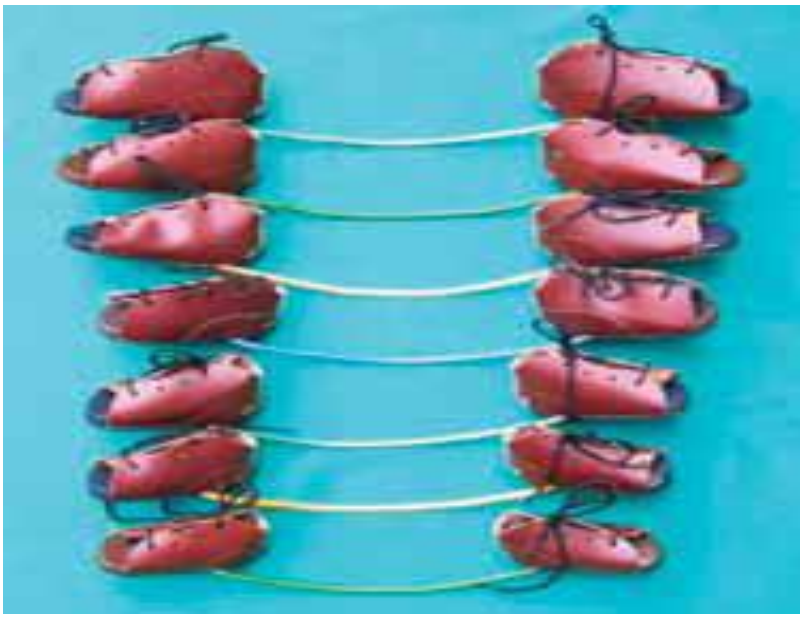
Children with plaster casts: Source; (Ponseti, 2005)



Foot abduction braces: Source; (Ponseti, 2005)

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Child fitted with foot abduction braces: Source; (Ponseti, 2005)

Conservative management is normally seen to be safer than surgery. However, manipulations and serial casting have been reported to have problems such as pressure sores; reaction to Plaster

of Paris, fractures, rocker-bottom defect which comes as a result of forcefully correcting the equinus before rectifying the adduction and varus constituents, (Ponseti, 2005; Colburn & Williams, 2003). In a study by Turkey et al. (2006) as cited by kazibwe, it is reported that out of the 92 children with clubfoot treated conservatively, nine children did not comply with casting stage owing to development of pressure sores, swelling and allergic reaction of the skin which affected the treatment.

2.5.1.2. French method

The French intervention includes everyday elongating of fibrotic tissues of the clubfoot, cutaneous stimulation of the deteriorated peroneal muscles of the foot by soft and moderate strokings, passive movement of the joints followed by immobilization of the foot with adhesive tapping for 20 months (Richards, Johnston & Wilson, 2005). This long treatment period calls for commitment from the parents/caregivers to attend every day treatment sessions as well as carrying out stretching, joint mobilization exercise and daily strapping of the foot (Faulks & Luther, 2005).

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Research has shown that French method may be ineffective in management of older children and the duration of management is likewise criticised for being daily and long (Richards et al., 2005). However, even with its limitations, the French method has been reported to be adequate in treating clubfoot in new-borns in Europe. Though, no literature is available about its use in developing countries.

2.5.1.3. The kite method

The Kite method entails using pressure on the foot medially, and everting the calcaneus to correct the varus. The kite method also allows the correction of the cavus although the correction

of the equinus deformity takes a long time. This method does not correct the cavus deformity fully but locks the subtalar joint such that the calcaneus does not abduct. The manipulation is followed by application of below knee plaster cast. The plaster is changed weekly for the first 6 weeks then every two weeks until the child is four to six months old. Changing of the plaster allows inspection, mobilization exercises and stretching of the foot further in the correction position. Kite method requires a period of 20 months in plaster as opposed to Ponseti that applies a cast for maximum of two months. The cast in Kite method is followed by use of orthotic braces for four years (Noonan & Richards, 2003).

In the past the kite method achieved successful results. However, this method has been criticized by many researchers. It is suggested that only 15% of clubfoot responds satisfactorily with this method. The low success rate is attributed to poor manipulations and the length of treatment period (Dobbs, Morcuende, Gurnett & Ponseti, 2000).

Norgrove (1999) reported that Kite method was the treatment of choice in Uganda before the inception of the Ponseti method in 1999. However, Ponseti (2005) states that very little information is available on conservative methods of treating clubfoot and almost no information is available on clubfoot management outcomes in third world countries including Africa.

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2.5.2. Surgical interventions

Surgical correction is the only option of management for patients who present late for treatment (neglected clubfoot) and for cases which deformities have set in (complex clubfoot). Its aim is to restore structures and functions of the foot as near to normal as can be achieved (Richard et al., 2002). However, surgery requirement varies according to patients' deformity at presentation (Ballantyne & Macnicol, 2002).

Although several surgical interventions of correcting clubfoot are in existence, only two interventions are commonly used. These methods are the posterior release and the posterolateral and posteromedial release (Hogue et al., 2001). Additionally, tendon transfers (deltoid tendon) of very active muscles may be done to gain equilibrium on the forces acting on the foot muscles (Macnicol, 2003). On the contrary, under-correction in surgical management leads to recurrent of the deformity (Ballantyne & Macnicol, 2002) while excessive release of fibrotic structures may lead to valgus heel and stiffness of the foot (Ballantyne & Macnicol, 2002). After surgery, the patients are usually put on post-operative management which involves a series of casting to maintain the correction achieved (Macnicol, 2003).

Ponseti (1997) and Uglow and Clarke (2000) asserts that surgical interventions are accompanied by other challenges such as wound infections, fibrosis, scar/keloid formation, joints stiffness, weakness in muscles, residual pain around the ankle and relapses.

In cases of untreated clubfoot or inadequately managed clubfoot, a child usually walks on the dorsum or the lateral aspect of the foot as he/she grows up. Furthermore, the child experiences pain, joint stiffness around the ankle joint and a wobbling gait patterns. Special shoes are therefore necessary to put up with the impairment (Morcuende, 2006).

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Child with neglected clubfoot: Source; (Konde-Lule et al, 2005)

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2.6. CHALLENGES IN CLUBFOOT MANAGEMENT

2.6.1. Poor compliance with treatment

Leventhal, Riegel, Carlson and De Geest (2005) define compliance as the patient/caregiver's willingness to adhere to treatment requirement as proposed by the health care provider. Compliance is a contractual relationship between the health care provider and patient or parent/caregiver. Similarly, Gail, Carmel, Lubetzky, Vered and Heiman (2001) describe parents/caregivers compliance to rehabilitation as the ability of the parents/caregivers to abide by the requirements of rehabilitation treatment. These include following instructions, accepting restrictions and adhering to the appointments.

Poor adherence to casting and bracing among parents/caregivers of children with clubfoot is a major dilemma experienced by service providers in delivery of health care services (McEvoy,

Nydegger & Williams, 2003). Therapeutic efficacy in any treatment depends on the compliance of patients or parents/caregiver to the prescribed treatment procedure (Lewis & Fink, 2001). Research on compliance with medical care shows that poor/none compliance to treatment regime causes reduction in medical benefit since the main objective of management is not achieved. Poor compliance increases complications, health care costs as well as reducing the quality of life of the patient (Proctor, May, Theodore & Gatchel, 2005). Furthermore, a patient or parents/caregivers who are none compliant with clubfoot management rules have more chances of developing a recurrence of the deformity (Dobbs et al., 2004).

Proctor et al. (2005); Reginster & Neuprez (2006) and Dobbs et al. (2005) assert that compliance to clubfoot management procedures is imperative for attaining positive outcomes. Pirani et al. (2009) in their study found that without diligent follow-up of the treatment regime, recurrence ensues in approximately 80% of cases. This is contrary to 6% recurrence cases in compliant cases. Pesata, Pallija and Webb (1999) further point out that missed appointments not only disrupt the child's continuity of care, but also disrupt the relationship between the parent/caregiver and the service provider leading to frustration on the service providers. The authors further sustain that this frustration may affect communication with the parent/caregiver and may decrease empathy for the parent/caregiver in future interactions. Furthermore, the authors emphasize that parents/caregivers who miss appointments deprive themselves of professional services, disrupt parent/caregiver and service provider relationships, reduce opportunity for other patients to receive timely care by taking appointments away from those who may need it and indirectly contribute to rising health care costs.

According to Sureh et al. (2003), poor adherence to the treatment regime of clubfoot leads to poor results and relapses. Tanzania is the only country in Africa where this study was done

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(Scott & Evans, 1997). They reported that of the 26 patients that participated in the study on clubfoot, only a minority of parents/caregivers of children with clubfoot attended the clinic for more than three sessions for treatment. In their study, none of the participants attended the clinic satisfactorily to either be discharged after complete recovery or for surgery to be deliberated after inadequate management with non surgical intervention (Scott & Evans, 1997).

The study shows a huge challenge of compliance of patients/caregivers of children with clubfoot to treatment regime in developing countries especially in Africa. Non-compliance to treatment regime compromises the effectiveness of intervention and also accelerates development of more deformity that may be difficult to correct, these complications can result into disability (Roye & Roye, 2002).

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2.7.1.1. Factors affecting compliance

Studies on utilization of rehabilitation services shows that consistent follow up of treatment appointments forms a major role in improving structures and functions of the foot (Pirani et al., 2009). This is linked with positive results, improved activity, participation and better quality of life of the patient (Ponseti, 2005)

This section explores the influences that negatively or positively affect adherence to clubfoot treatment regime. The literature reviewed in this section is categorised in subsections which include socio-economic/financial factors, travelling distance, social/family support and patient/caregiver's knowledge about the condition.

2.7.1.1.1 Socio-economic/ financial factors

Socio-economic factor is major hindrances to accessing health care services in poor settings (McConachie et al., 2001). According to Meremikwu, Ehiri, Nkanga, Udoh and Alaje (2005),

despite the availability of effective treatment interventions in clubfoot management, the outcome of treatment in many parts of Africa remains sub-optimal. The authors attribute the poor outcome to poor socio-economic conditions. With poor social economic conditions, the parents/caregivers may not be able to afford the cost of services and transport to the health facilities for consecutive treatment for along time. In most poor settings like in rural areas of Uganda, many families of children with clubfoot could not afford the treatment services for their children (Pirani et al., 2009) which resulted in disability among the affected children (Pirani et al., 2009). A similar study in Ghana by Hill, Kendall, Arthur, Kirkwood and Adjei (2003) reported that poor financial status was the main challenge that affected parents/caregivers health seeking behaviour toward seeking suitable treatment for the sick children.

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2.7.1.1.2. Travelling distance

A study by Boydellet al. (2006) found that location and geographical accessibility of the health institution are major determining factors on how the patient takes part and keeps the treatment regime. Likewise, travel expenses increases the costs of providing and obtaining health care (Beardsley, Wish, Fitzelle, O'Grady & Arria, 2003). The authors further maintain that patients/caregivers in rural communities travel long distances to urban centres to access healthcare which involves high transport costs. This makes it difficult for them to adhere to therapeutic regimes (Beardsley et al., 2003).

According to Tolhurst and Nyonator (2006), long distance to health facilities is a major challenge to health care services utilization. This concurs with the results of a study by Olova, Munoz, Lynch, Mkocha and West (1997) in Tanzania; it was shown that long distances and high cost of transport affected the use of surgical intervention in clubfoot management which affected compliance with the treatment appointment.

2.7.1.1.3. Social/family support

Letvak (2002) and Al Poire (2000) states that social support is a multidimensional process operationalized on the basis of who is giving the assistance, amount and value of support. The authors define social support as support offered by relatives, friends and professionals. This assistance may be in form of finances, emotional support, physical assistance and informational support during the treatment period.

There is paucity of published literature on social support offered to parents/caregivers of children with clubfoot. However, some of the ways in which families with children that have physical disability take care of stress during management and care of their children is through the use of support systems (Hanneman & Blacher (1998). The authors further indicated that the aim of support is to strengthen or improve adherence to treatment regime through financial assistance, taking up domestic chore as the parent/caregiver takes care of the child or assisting in taking care of the affected child (physical support), emotional support and education on the condition and the treatment process. Financial support facilitate payment of the treatment services and transportation of children and the parents/caregivers from home to the facilities while support with the domestic chore gives the parents/caregivers time to concentrate with the child, this facilitates adherence to the treatment regime.

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A study done by Pais-Ribeiro and Meneses (2006) on social support of epileptic patients in Portugal indicated that patients who received support from family members and health care givers can cope with the stress of the condition and comply with treatment. Availability of Information serves to enlighten parents/caregivers on the management, their roles and the importance of adherence to the treatment regime (Pais-Ribeiro & Meneses, 2006). A similar study by Moran and DuBois (2002) and Goodman (2001), found that the connection within the

family system was perceived cohesive, flexible and supportive and had a positive effect on parents/caregivers in coping with clubfoot and complying with the treatment regime

Support systems alleviate strain related to care of the child during treatment regime (Pais-Ribeiro & Meneses, 2006; Hanneman & Blacher, 1998). Letvak (2002) and Kazdin and Wassell (2000) further found that families with good social support experience less challenges during the treatment period, are able to keep the treatment appointment and successfully complete the treatment regime than those without social support.

2.7.1.1.4. Parent/caregiver's knowledge

Patients/caregivers fail to attend or discontinue with the treatment appointments due to lack of understanding of the treatment procedure or not knowing how the treatment works (Bultman & Svarstad, 2002). When a patient or a parent/caregiver gets the knowledge about management and how these management lead to better health, they are likely to pursue care and comply with the recommended treatment procedure (Levers et al., 1999). O'Callaghan, McAllister and Wilson (2005) assert that increase in health information among patients and parents/caregivers about their illness enable them to make informed choices concerning their health needs.

Currently there is very little published literature on parents/caregivers knowledge on clubfoot. A study by Lu, Du, Liu, Oprescu and Morcuende (2010) identified knowledge gap in patients/caregivers as a major barrier to the Ponseti method in China. This gap made it difficult for parents/caregivers to understand each step of the treatment, leading to non-compliance. Some parents/caregivers discontinue treatment after casting because they did not understand why they should continue with brace. Similarly, secondary illness that affected the children (e.g., a cold) caused some parents/caregivers to temporarily discontinue the use of the brace. Other

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parents/caregivers were worried about their children's comfort during treatment and the difficulty of holding their children with braces (Lu et al., 2006).

The knowledge gap was compounded by the healthcare believes in China. Patients often went to larger hospitals to seek treatment because they believed that they would receive better quality of care. In similar studies, Pirani et al. (2009) and Konde-Lule et al. (2005) found that in Uganda there were families that did not understand Ponseti method and chose different methods for clubfoot treatment or no treatment at all.

Information on one's illness may be a motivating factor to adhere to the treatment regime. When people take a step to learn about their condition, they will make an effort to control it (Weiss et al., 2003). Therefore, knowledge may play a role in the compliance with rehabilitation interventions which could be achieved through education on health to the parents/caregivers at the talipes clinics.

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2.7.1.1.5. Social stigma

Most of the African culture considers clubfoot a physical disability (Ponseti, 2005). A study conducted in Malawi on clubfoot by Bedford (2009) found that people use derogatory term referring to clubfoot. The author explained that the terms used to describe disability were oppressive and had negative connotations. Clubfoot is often stigmatised by its description as "cripple". Such generic labels were said to bring associations of abnormality that has the potential to negatively influence all aspects of social interactions and treatment seeking behaviour of the parents/caregivers for their children (Bedford, 2009).

Majority of patients/caregivers of children with clubfoot experience a range of negative behaviour or negative attitudes as a direct result of clubfoot (Staheli, 2009). This may lead to the parents/caregivers hiding their children and fail to attend treatment appointment. Similarly, parents/caregivers of children with clubfoot face divorce, reprisals and exclusion which may force them to relocate to areas which are inaccessible to health facilities hence compromise adherence to treatment.

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Fathers seldom present patients at the talipes clinics and are largely disconnected from their child's treatment (Bedford, 2009). This disconect may affect compliance especially when the father is the sole care taker of the child. Similarly, fathers who are disconnected from their children treatment deprived the mothers/caregivers the social support most needed for adherence as previously mentioned (Letvak, 2002; Al Poire, 2000). Additionally, some of the cultures consider clubfoot as a curse or punishment for wrong doing hence no support is offered to these children and their family. These elements tend to affect the consistency with treatment and may lead to non-compliance or neglect clubfoot.

In many occasions, girls affected with clubfoot especially those from poor setting do not receive treatment unlike boys with the same impairment (Bedford, 2009). In most African cultures, male children are given priority hence provision of health care unlike girls. Additionally, girls with disabilities are considered less useful (Bedford, 2009), as a result, treatment to these girls is considered a waste of family resources (Bedford, 2009).

Additionally, a study conducted by Broardman and Morcuende (2010) in Chile and Peru, found that some parents/caregivers rejected the use of abduction brace because of the social stigma associated with children in orthotics braces. However, the author indicated that most parents/caregivers complied after the physician explained that the brace was required to prevent regression of the clubfoot. A similar study by Lu et al. (2010), found that the family of the patient with clubfoot felt ashamed and embarrassed about having "bad genes". They did not want to publicize their "bad genes" by seeking treatment for their children at the health facilities. This was a clear indication of how social stigma negatively affected the treatment and adherence to clubfoot.

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2.6.2. Challenges with management approaches

Treatment of clubfoot remains controversial issue regarding the appropriate method to be used (Kampa et al., 2008). Service providers have different perceptions on management of clubfoot. According to Khan et al. (2006), some service providers have stuck to surgical intervention while others have embraced the conservative method (Dobbs et al., 2004; Morcuende et al., 2004; Colburn & William, 2003). The choice of treatment method affects the outcome, depending on severity and age of a client (Sami, Hanif & Awais, 2010). In infants of < 2 years, the anatomical structures are difficult to identify making surgical intervention difficulty (Roye et al., 2002). Surgery at this age leads to post operative complications. On the other hand the use of

the conservative method for children above 2 years may affect the quality of the outcome of the procedure used since it is difficult to immobilize an ambulant child in a cast. On the contrary, Ponseti (2005) argues that clubfoot management does not depend on severity but depends on the time of intervention. The author asserts that conservative method is the best approach for effective management and should commence immediately after birth.

Broardman and Morcuende (2010) identified service providers' education as a barrier to the diffusion and implementation of the Ponseti method. In Chile and Peru like many other countries, the Ponseti method is not taught as a method of treating clubfoot in medical schools. In order to attend a Ponseti training session, physicians need to be off duty and pay fee (approximately $100 US) to attend the training. Additionally, some physicians that have been trained on Ponseti may see only a few clubfoot patients each year which is inadequate to sustain their experience.

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Many physicians believe that a lot of physicians, especially in rural areas, still do not understand clubfoot, its treatment options and the Ponseti method. Physicians who are not trained in Ponseti management advice parents/caregivers to wait until their afflicted children grow older and then have surgery. Some physicians even make modifications to the Ponseti method, rendering it less effective (Lu et al., 2010). Likewise, some of the service providers do not attend formal training sessions but learn the method from other colleagues or over the Internet. Most of the trained service providers distrust those who are informally trained in the Ponseti method because there are unsatisfactory results mostly due to modification of the techniques and protocols. In general, there is therefore little knowledge of the benefits of the Ponseti method despite the fact that CURE International, a non-governmental organization, is currently leading a worldwide publicity campaign (Cure International, 2011).

2.6.3. Missed diagnosis and poor referral

According to the Ministry of Health Uganda (2009), the clubfoot is not diagnosed at birth by a few of the health workers or the traditional birth attendants. These children present later with neglected or complex clubfoot which impact on the method and the duration of management. A similar study by Lu et al. (2010) found that rural patients (clubfoot patients in China) do not get diagnosed and do not begin treatment until they are older. These patients present later for management which was found not to respond well with Ponseti management. Similarly, Boardman and Morcuende (2010) in their study found that most of the health facilities have poor referral systems which impact directly to clubfoot management. The authors asserts that poor referral may lead to inadequate management or delay in management.

2.6.4. Communication between service providers and parents/caregivers

Some of the factors that facilitate compliance with treatment is the communication between the patients/caregivers and the service providers (Buck, Jacoby, Baker & Chadwick, 1997). The authors noted that when a service provider is seen to be concerned and prescribe treatment as a sign of his/her concern; then the adherence of parents/caregivers or patients to the prescribed treatment is more likely to be higher. Additionally, the frequency of interaction between patients and the service provider can also be an influencing factor in promoting compliance with the recommended treatment (Buck et al., 1997). Similarly, Irochu-Omare (2004) emphasizes that the patients' knowledge of the condition is a constituent of communication that need interpretation about the problem and procedures of management. Kyngäs (2007) further suggests that a good communication skill facilitates a two-way flow of information that enables the two parties to formulate treatment and adhere to it. A study by Bultman and Svarstad (2002) affirm that proper

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service provider and parent/caregiver communication guides the patient or parent/caregivers on treatment and changes his or her views about the consequence of treatment.

In another study, Van Wieringen, Harmsen and Bruijnzeels (2002), found that the service providers and patients/caregivers have different understandings and models for illness or disease. It is therefore important to understand the patient/caregiver's model for the condition during treatment session and try to close the gap between the patient'sandcaregiver's and service provider's concept of the disease. This can be best attained through effective communication with the patient/caregiver. A study by Smaldone, Honig and Bryne (2005) on delayed care for children with special health care found that parents/caregivers whose service provider never spent adequate time with them or listened to their concerns were more likely to forgo care than patients or parents/caregivers whose service provider spent adequate time with them or listened to their concerns.

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Service provider-patient communication has a major impact on the views about the quality of services offered and affects the use of health services (Van Duong et al et al., 2004). Good service provider approach towards patients serves to provide contusive atmosphere that enhances service provider-client interaction. This leads to satisfaction with the treatment given and more dedicated clientele (D'Ambruoso, Abbey & Hussein, 2006).

Poor service provider-patient communication is an obstacle to accessibility and utilization of health care services in many African countries (Labhardt, Cerutti, Fischer, Manga & Stoll, 2010). Sharkawy et al. (2006) conducted a study in Kenya on children with epilepsy. They found that the parents/caregivers had unfriendly or unproductive encounter with service providers in health care facilities. These experiences stopped the parents/caregivers from following the treatment appointments. In another study, Labhardt, Cerutti, Fischer, Manga and Stoll (2010) found that

offensive language from health providers in government facilities stopped women going for antenatal check ups in public health facilities.

Therefore, good communication between the patient/caregiver and the health provider during consultations and treatment is vital for common understanding and agreement and most often, it is a good predictor of compliance to the recommended care.

2.7. FACILITATORS

2.7.1. Financial Support

A number of organisation have been identified in management of clubfoot, this includes non gorvernmental facilities that offer assistance in management of clubfoot disorder. In africa, their activities have been noted in countries such as Uganda, Malawi, Rwanda and Kenya. The support is offered in the form of financial support and training for the health workers in Ponseti methods of management of clubfoot (Harrison & Scott, 2002).

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In countries like Uganda, Ponseti method has been launched in nationwide programmes by CBM which is a non governmental organisation; this has been accompanied by massive public health education and awareness campaigns to facilitate increased knowledge about clubfoot, early identification and referral of children born with clubfoot. (CBM, 2011).

2.7.2. Free services

In most parts of the world where ponseti is utilized as the method of management of clubfoot, services are offered for free, both surgical and non-surgical method (Ministry of Health Uganda, 2005). Cure international, a charitable organisation facilitate management of clubfoot and most importantly in developing nations, these countries includes; Niger, Kenya, Uganda, Malawi and Ethiopia among others (Cure International, 2011). This organisation provide the largest standard

of paediatric orthopaedic care. Additionally, they have a commitment to teaching medical student, orthopaedic clinical officers and other paramedic on clubfoot management. In addition, they provide free services to children with clubfoot; Harrison & Scott, 2002).

2.8. PERCEPTIONS ON MEDICAL MANAGEMENT OF CLUBFOOT

There is scarcity of published literature on the perceptions regarding medical management of clubfoot. However, researches have been done on perceptions on other disabling conditions such as cerebral palsy, epilepsy and spinal bifida among others. In studies done by Sharkawy et al. (2006) and Buck, Jacoby, Baker and Chadwick (1997) on epileptic children, it was found that most of the children with epilepsy got reduction in frequency and number of seizure from the anti- epileptic drug prescribed from the health facilities. Similarly, Konde-Lule (2005) assert that rehabilitation services in Uganda facilitates improvement of milestones in cerebral palsy cases with delayed milestones. The authors further admits that in cases where rehabilitation services are not provided for cerebral palsy cases, the children result with secondary complications such as contractures and bedsores. Therefore, medical management of disabling condition in paediatric is considered as vital services.

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2.9. BIOPSYCHOSOCIAL MODEL

This is a model that suggests that biological, psychological and social factors play a significant role in human functioning in the context of disease or illness (Borrell-Carrio, Suchman & Epstein, 2004). The model asserts that health is best understood in terms of a combination of the three factors rather than purely in biological terms (Ghaemi, 2009). The biological component of the biopsychosocial model seeks to understand how the cause of the illness emanates from the functioning of the individual's body (Margalit, Glick & Benbassat, 2004). The psychological

component of the biopsychosocial model looks for potential psychological causes for a health problem such as lack of self-control, emotional turmoil, and negative thinking (Margalit, Glick & Benbassat, 2004). The social part of the biopsychosocial model investigates how different social factors such as socioeconomic status, culture, poverty, technology, and religion can influence health (Ghaemi, 2009). This model implies that treatment of disease processes requires that the health care team address biological, psychological and social influences upon a patient's functioning (Ghaemi, 2009). The biopsychosocial model presumes that it is important to handle the three constituents together (Margalit, Glick & Benbassat, 2004). A growing body of empirical literature suggests that patient perceptions of health and threat of disease, as well as barriers in a patient's social or cultural environment, appear to influence the likelihood that a patient will engage in health-promoting or treatment behaviours, such as medication taking, proper diet or nutrition, and engaging in physical activity (Margalit, Glick & Benbassat, 2004).

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2.10. SUMMARY

Literature review has established the perceptions regarding medical management of clubfoot. This chapter has therefore presented a narrative review of the literature on clubfoot as a condition and its medical management. The chapter has also given an overview of the incidences of clubfoot and the proposed causes. In addition, literature has explained the management of clubfoot and the advantages and disadvantages of each intervention. Also covered is the service providers, their various roles in management of clubfoot as well as the parents/caregivers and their perceptions regarding medical management of clubfoot. The literature has finally defined barriers and facilitators from findings of previous studies encountered in the course of management of clubfoot by the service providers and parents/caregivers and its relevance to treatment.

CHAPTER THREE

METHODOLOGY

3.0. INTRODUCTION

The chapter explains in detail the research setting, research design, study population, sampling, the research instrument used for data collection and the research procedures. The chapter further describes the procedure on how data was analysed and finally the chapter ends with the ethical considerations.

3.1. RESEARCH SETTING

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The research was conducted in three hospitals in Kenya. Kenya is a country located in the eastern part of Africa and among the developing counties in sub-Saharan Africa. The country has a population of approximately 40 million people. It is divided into eight provinces namely; Nairobi, Rift valley, Central, Eastern, Western, Coast, Nyanza and North-Eastern. The eight provinces are further divided into 47 counties. Two of the hospitals are located in Nairobi province while one is in the Central province. The study was conducted at the talipes clinics in Mbagathi District Hospital, Kenyatta National Hospital and Kijabe Mission Hospital.

Mbagathi District Hospital is the second largest hospital in Nairobi province with a bed capacity of 360; it provides services to eight districts. The hospital has well-established departments of pediatrics, gynecology and obstetrics, surgery, orthopedics and internal medicine with well-structured casualty and an outpatient department. The researcher chose the hospital because it is a referral public hospital for the province with a multidisciplinary rehabilitation unit. Talipes clinic at the hospital is housed in the orthopedic department and is operational once a week. Patients that attend these clinics are sent from other hospitals, dispensaries, health centers as well

as clinics within the capital and the eight districts in Nairobi province. The service providers at the clinic includes; two counselors, four physiotherapists, three orthopedic technologists, three occupational therapists and two surgeons.

The talipes clinic at Mbagathi has a total of 14 service providers and sees an average of 36 outpatient clients in a month. In addition, medical students from Kenya Medical Training College are attached here during their clinical attachment. The medical records at the talipes clinic showed that most children with clubfoot attended at the clinic are referred from the new-born unit, pediatric clinic and other hospitals in the city. The talipes clinic at Mbagathi District Hospital is one of the satellite clinics of Cure Clubfoot Kenya (CCK). Cure Clubfoot Kenya (CCK) is a non governmental organisation that works in conjunction with Kijabe Mission Hospital and provides resources for management of clubfoot for all the satellite clinics in the country. Therefore, services provided at the talipes clinic at Mbagathi District Hospital are free of charge.

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Kenyatta National Hospital has a bed capacity of 2500. It serves as the referral hospital for East and Central Africa and the eight provinces in Kenya. The Hospital has departments' of gynecology and obstetrics, surgery, oncology, internal medicine, casualty and with an outpatient department for each department. Kenyatta National hospital ran as a private institution. However, the government provides finances for recurrent expenditure.

The tallipes clinic is housed in orthopaedic department (clinic 46) and is open every Wednesday. It has a team of four orthopaedic technologists, five physiotherapists, four occupational therapists and three counsellors. Services provided in the talipes clinic at this hospital are offered at a fee. Parents/caregivers have to pay 1000 Kenyan shillings (R100 equivalent) for plaster cast that is

used for correction of clubfoot and 1500 Kenyan Shilling (R150 equivalent) for foot abduction braces.

The clinical records from the talipes clinic in Kenyatta National Hospital indicate that most patients at the clinic are referred from the new-born unit, paediatric unit and out patient clinic. However, children are also referred to the clinic from other hospitals, dispensaries, health centres and clinics within Nairobi province, neighbouring provinces and from all-over the country as it is a referral hospital. Some parents/caregivers of children with clubfoot refer themselves or are referred by other parents on getting to know about the availability of the services at Kenyatta National Hospital. Kenyatta National Hospital has 16 service providers and sees an average of 45 clients with clubfoot per month.

Kijabe Mission Hospital is tucked on the hills of the Great Rift Valley along the Nairobi-Nakuru highway in Central Province. Among the critical services the hospital offers are orthopedic surgery and pediatrics surgery. At Kijabe Mission Hospital is Cure Clubfoot Kenya, which is the mother of most talipes clinic in Kenya. CCK has four full sized operating theatres, a private wing for the in-patient with a bed capacity 500 and a conference center (Cure International, 2011). This program was started to address clubfoot in Kenya and has 37 clinics in the country. The service providers includes; three orthopedic surgeons, two counselors, four physiotherapists, three orthopedic technologists, two occupational therapists, eight nurses and nursing students and are working at the multidisciplinary tallipes clinic. Being a mission hospital, the cost of medical care for clubfoot is free (Cure International, 2011). The researcher chose CCK because it is the only setting where surgery for clubfoot is done. Kijabe talipes clinic has 22 service providers and sees an average number of 50 inpatients clients per month.

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3.2. RESEARCH DESIGN

A qualitative approach was utilized for data collection; this method was found suitable for this study as very little is known on perceptions and experiences (WHO, 2007) regarding medical management of clubfoot in current study setting. By adopting this method, the researcher was able to achieve a greater breath and depth of understanding the participants' expressions, perceptions and views of the phenomenon under investigation. This would have been difficult to meet if quantitative method of research was adopted (Ulin, Robinson & Tolly, 2005; Frederikson, Chamberlain & Long, 1996). The qualitative design was also appropriate since it pursued the individual responsiveness and views on management of clubfoot. Whereas qualitative paradigm has been disapproved for its subjectivity characteristic, it was this extraordinary subjectivity that the researcher was able to get individual experiences and perceptions and utilized it as the core focus of the study as recommended by Kondracki and Wellman (2002). The researcher was able to access subjectivities and so prompt a sense of the individual within the participant (Parker, 1994).

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Creswell and Miller (2000) reported that qualitative research is discredited for the characteristic partiality of the researcher. Much as the researcher does not refute this subjectivity; the researcher's involvement in management of clubfoot was seen as a contribution to this research. The influence of the researcher's involvement will be acknowledged in reflexivity.

3.3. STUDY POPULATION

The population for the study included all parents/caregivers of children with clubfoot at three hospitals and the service providers at the talipes clinics of the three facilities in 2011. The talipes clinic at Mbagathi has 14 service providers and sees an average of 36 clients in a month, Kenyatta National Hospital has 16 service providers and sees an average of 45 clients per month,

while Kijabe has a number of 22 service providers and sees an average number of 50 clients per month.

3.4. RESEARCH SAMPLE

Purposive sampling method was utilized to select from information rich cases for the study (Patton, 1990). The researcher employed purposive sampling as a strategic approach for selecting the participants for their ability to provide rich information (Ulin et al., 2005). This method was based on the judgement of the researcher. This was due to the fact that a sample was made of elements that embraced the most characteristic representative of the population to be studied (Marshal, 1996). These characteristics included different service providers who were managing clubfoot at the talipes clinics at the time of data collection. The sample of parents/caregivers included parents/caregivers of children that had been managed surgically and the ones who were on conservative management. In conservative management, the sample incorporated parents/caregivers of children in different stages of management and those able to speak in English, Swahili or both in addition to having proficiency in communication.

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Convenient sampling was then done to sample service providers due to their availability (Patton, 1990). The final sample consisted of ten parents/caregivers of children with clubfoot and ten service providers. Two parents/caregivers had children who had gone through surgery whereas eight went through the conservative path. In Kenya, surgery is rarely done, so most of the cases are managed conservatively in a ratio of two to eight. The sample of service providers included, two orthopedic surgeons, two counselors, two physiotherapists, two occupational therapists and two orthopedic technologists to have 10 service providers. A sample of 20 participants was used for the study as recommended by Creswell (1998).

3.5. DATA COLLECTION METHOD

Semi-structured interviews were used as a primary strategy for data collection (Bogdan & Biklen, 1982; Eisner, 1991). The researcher used semi-structured questions and probes. Semi-structured interviews were suitable as the researcher was interested in the complexity of the issue. It gave the participants the opportunity to respond in their own words and express themselves fully (Pelto & Pelto, 1997). The interviews also allowed the researcher to control the line of questioning. On the contrary, the researcher's presence may have influenced the responses and sometimes the participants were not equally articulate and perceptive. The study utilized an interview guide for the data collection.

The interview guide consisted of a set of broad general questions which steered the interviews without strict adherence to the order of the questions (Lee, 2008). Interview guide was prepared to ensure that basically, the same information was obtained from each participant (McNamara, 2009). With semi-structured interviews, the researcher was free to probe and explore within these predetermined inquiry areas. The interview guide ensured good use of limited interview time; it made interviews more systematic and comprehensive and it helped to keep the interactions focused as suggested by McNamara (2009). Interview guide provided more focus than the conversational approach and still allowed a degree of freedom and adaptability in getting information from the participants.

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The interview guide (**Appendix C** and **D**) was developed based on literature on medical management of clubfoot and the research aim and objectives (Lofland, Snow, Anderson & Lofland, 2001). The interviews were flexible enough and issues that arose were explored to the satisfaction of the researcher. The subjects gave their views, perceptions and experiences without straying away from the aim and objective of the study (Rubin & Rubin, 1995). The order of the

questions in the inteview guide were not followed, and not all the questions were asked or asked in the same wording to all the subjects, this was done to allow the dicussion be as normal as possible.

A general question was preferred to start the interview in order to make the participant calm down before getting to the finer details of the study. The broad question for the study was 'please tell me about management of clubfoot'. Probes were used whenever it was necessary. The purpose of probes was first, to show the participant the depth the researcher desired, this guided the participant toward the direction the researcher was interested in. The second purpose was to request the participants to refinement a particular response. The third purpose was to show the participants that the researcher was attentive and keen on what they were saying.

3.5.1. Procedure of the study

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Consents to conduct the study were obtained from the authorities of the three hospitals, University of the Western Cape research grants and study leave senate and from the persons in charge of the talipes clinics. The researcher contacted the person in-charge of the tallipes clinics and explained the aim and objectives of the study. The researcher then provided them with the characteristics of the participants that were required for the study to facilitate getting the participants. The in-charges provided the service providers with information about the study and enquired of their willingness to participate in the research project. Parents/caregivers were invited separately every time they attended the clinics. When an individual showed interest in participating, the researcher was informed by the in-charges of the talipes clinics and provided with the participant's contact. The participants were selected based on characteristics of the purposive sampling. The participant were then asked to fill in a consent form (**Appendix A**), which was later left with the in charges of the talipes clinics for the researcher. The researcher

later contacted the participants, scheduled the interview at a time and place convenient to the participants. Participants that consented were then officially invited to take part in the study with a letter which had the information of the study and the researcher's contacts for any clarifications.

At the time of the interview, the researcher introduced self as a student in physiotherapy and that the project was part of the masters program. Twenty participants were interviewed with one interview taking between forty-five minutes and one hour. The researcher with the help of the research assistant conducted the interviews. The participants expressed their perceptions, experiences and opinions on medical management of clubfoot. The interviews were audio recorded and the research assistant took the field notes. Saturation was reached when participants were giving the same information that had been given by the other participant. In this case saturation was reached during the tenth service provider and eight parent/caregiver interviews. The ninth and the tenth parents/caregivers were interviewed since a prior appointment had been made and the interviews were included in the study.

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Three interviews were conducted every week until all participants were interviewed. After every interview, the audiotapes were played back to the participant so as to confirm whether it was a true reflection of the interviews and if necessary make clarification. The tape listening served as member checks and also was meant to ensure that the recorded information was clear and of good quality. Any changes that arose were made on a notepad; this extra information was later combined into transcripts. In areas where the researcher wanted more explanation on any topic, she made further telephone calls. A copy of a summary of analytical categories and subcategories as well as verbal explanation by the researcher of interpretations and preliminary conclusions were made and presented to the first seven participants. They were in agreement that

the items were reflective of the interviews. Ten interviews with the parents/caregivers were conducted at the talipes clinics. Interviews with the service providers were conducted; two in an operating theatre, one in the office, one at a golf club which was convenient for the participant, five at the orthopaedic department and one was conducted in a clinic within the city where the participant had a business.

3.6. TRUSTWORTHINESS

Baumgartner, Strong and Hensley (2002) suggest credibility, transferability, dependability and confirmability as measures for truthfulness of a qualitative study. The aim of trustworthiness is to support the argument that the findings are worth paying attention to (Creswell & Miller, 2000)

Credibility

Credibility refers to confidence in how well data and the processes of analysis addresses the intended focus of the research (Polit & Hungler, 1999). To address credibility, the researcher sampled participants from various medical disciplines and parents/caregivers of children receiving surgical and conservative management (different stages) and described them as proposed by Brink (1999). The researcher gathered information until saturation was reached, used field notes and member checking after the interview as recommended by Lincoln and Guba (1985). During the process of member checking, seven participants reviewed a summary of the data analysis and final results of the inquiry. An independent review from two postgraduate students and a peer review by a local supervisor further made certain the credibility of the study (Lincoln & Guba 1985; Woods & Catanzaro 1988).

Transferability

This refers to the extent to which the findings can be replicated to other settings or groups. The researcher in this study has given a detailed description of the research methodology used during

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data collection and analysis. This is supported by direct quotes from the interviews. This has given ‘thick description’, which is the measure for transferability (Marshall & Rossman, 1995).

Dependability

Dependability explains the degree to which data change over time and alterations made in the researcher’s decisions during the analysis process. In the current study, the researcher achieved dependability by giving adequate information about participants’ “verbatim quotes” to allow the reader to consider the study dependable. It was additionally achieve by use of a rigorous audit of all data sources and data reconstruction by a local supervisor from Jomo kenyatta University of agriculture and technology (Miles & Huberman, 1994)

Confirmability

According to Polit and Hungler (1995), confirmability is the ability of data to signify that it is sincere and reliable. This was achieved through face-to-face interviews and data triangulation. Triangulation is a method used to check and establish validity of a study by analysing a research question from multiple perspectives (Patton, 2002)

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3.7. METHOD OF DATA ANALYSIS

Bogdan and Biklen (1982) define qualitative data analysis as "working with data, organizing it, breaking it into manageable units, synthesizing it, searching for patterns, discovering what is important and what is to be learned, and deciding what you will tell others". Qualitative analysis requires some creativity; the challenge is to place the raw data into logical, meaningful categories, to examine them in a holistic fashion and to find a way to communicate this interpretation to others. The goal of qualitative data analysis is to produce a detailed and systematic recording of the themes and issues addressed in the interview and to link the themes and the interviews together under a reasonable exhaustive category system (Burnard, 1991).

As stated earlier thematic content analysis method was used to analyse data as recommended by Richie and Spencer (1993). The ideas that emerged were managed under the control of thematic content analysis. This method has a clear and visible research methodology where analysis is based on predetermined themes and the interview data (Creswell & Miller, 2000). Data analysis began by translating three interviews from Swahili to English by Mary Waithera who is a specialist in linguistic services and then transcribed verbatim by Everlyne Charu "professional transcriber".

Data analysis entailed the preliminary familiarization with the data (Graneheim & Lundman, 2004). The first analytical process was used to make the amount of data more manageable but maintain the quality (Graneheim & Lundman, 2004; Silverman, 1998). The researcher went through every sentence, finding out whether the sentence was related to the aim and objectives of the study and assigned codes to each sentence to denote meaningful unit. The researcher assigned a short descriptor (code) to a meaning unit as a means to reference this sentence. The researcher grouped codes together and named them (form themes) using cut and paste method. Having all pieces of the texts that related to a common theme together in one place enabled the researcher to discover new subthemes and explore them in a greater depth (Ulin et al., 2005). This process was repeated for other transcripts and patterns emerging under each theme were noted.

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Associated patterns were then joined and categorised into sub-themes. Themes were identified by means of putting together pieces of ideas, perceptions, views, opinions or experiences, which had no meaning when looked at alone (Graneheim & Lundman, 2004; Silverman, 1998).

This way, all important pieces of the transcripts were put together as one according to thematic orientation. This outline was then used for the whole data that were relevant to the study aim and

objectives. The themes were developed from the emerging issues from participants, analytical themes coming up from the data and the aim and objectives of the study. The clusters were then examined to gain the varieties and classes within every theme, and relations and patterns among themes established.

Themes that arose from the subjects were then put together to form a complete picture of the subjects' collective perceptions, needs, views, opinions and experiences. The consistency of the ideas however rested with the researcher who has rigorously studied how different ideas or components fit together in a meaningful way when linked together (Leininger, 1985). Therefore, analysis was certainly selective with the likelihood that other researchers could find different themes from the same data used in current research. When gathering sub-themes to obtain a comprehensive view of the information, it was easy to see a pattern emerging. The next step was to construct a suitable argument for deciding on the themes to present the final interpretative analysis of the data. It was not a clear-cut procedure as on a number of occasions, the data was revisited several times to filter and classify the developing themes.

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Discussions with two colleagues and a local supervisor who were involved in data analysis process guaranteed that themes were broad and sufficiently comprehensive. In order to maintain anonymity, participants' names were changed and cited using codes. The research analysis was planned around the understanding of these discussions and was controlled in ways that endeavoured to be unbiased.

3.8. ETHICAL CONSIDERATION

The researcher got ethical clearance from the Senate Research Grants and Study Leave Committee of the University of the Western Cape as required (**Appendix E**), the AIC Kijabe Mission hospital (**Appendix F**), the Kenyatta National Hospital/University of Nairobi Ethical Committee

(**Appendix G**). Further consent was obtained from the Ethical Clearance Committee, Mbagathi District Hospital (**Appendix H**), and from each participant. Ethical considerations followed those of universal scientific research and those that are applicable to qualitative study. Qualitative study calls for the researcher to respect the participants and that the methodology reveals this respect (Creswell & Miller, 2000). Efforts were made to give respect to all the participants, appreciating their views and the researcher as the recipient. The researcher took ethical measures, approaches and customs in order to validate the importance the researcher placed on the participants and their perceptions. Informed consent forms were signed by those willing to participate in the study. The researcher preserved an attitude of transparency. To ensure confidentiality, the researcher ensured that participants remained unidentified, changing their names and identifying participants using codes. The researcher accorded all participants the opportunity to withdraw their consent in accordance with qualitative research principles. Recorded audiotapes and other study materials were kept under lock and key where only the researcher had access. All the research material will be kept for 5years.

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The research design, methodology and procedure made the contribution of the participants and the researcher quite pertinent in the subject that affects so many individuals. The researcher considers this an important part of the credibility of the study.

3.9. REFLEXIVITY

Self-reflexivity formed a substantial and essential part in this study. This meant that great considerations of the physiotherapy profession, transparency and limitations of the role of the researcher, including her own social, and professional experience. It had been difficult for the researcher to amalgamate educational and professional training with the effects of social factors

on management of clubfoot. It was also considered critical to employ critical thinking and analysis during the whole process of this study. The researcher reflected and reviewed the assumptions made in the study, including analysis of the data, interpretation of the literature and knowledge about the situation. The study was peer reviewed by the supervisor and an additional person working in the field to gain feedback and to promote the process of self-reflexivity. This study was based on the biopsychosocial approach.

SUMMARY

The chapter described the research setting where this study was conducted and examined the approach utilized for data collection. The study design, study population, sampling method, study sample and instruments were well described together with the motivation for using these methods. The procedure for data collection and analysis were also explained. In conclusion, ethical issues relating to the study were given before briefly touching on the reflexivity of the researcher.

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CHAPTER FOUR

RESULTS AND DISCUSSION

4.0. INTRODUCTION

In this chapter the results of the study are presented in the form of qualitative thematic content. Results of this study attempts to give a comprehensive meaning to findings in the context of the literature available in the field as clearly as possible and in a narrative form. The discussion included the participants' perceptions and experiences regarding medical management of clubfoot in three hospitals in Kenya. The data was collected from 10 semi-structured interviews for the service providers and 10 semi-structured interviews for the parents/caregivers. Participants' quotes have been highlighted where they are appropriate to the discussion. The quotations alongside each of the identified themes have been extracted from the interviews and are presented in inverted commas and in italic to differentiate them from the literature. Materials that are not relevant to the discussion have been left out from the speech marks by use of three abbreviation point (…).

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In this chapter, the researcher will introduce the results as presented by the participants; discuss the result based on available literature and finally, the implication of the study. The discussion focuses on the following

1. To explore the social demographic characteristics of the participants.
2. To explore the service providers perceptions of the use of different methods of medical management of clubfoot.

3. To explore the processes followed before actual management commences and after management from the service providers when using the surgical and conservative method of management.
4. To explore the barriers and facilitators that the service providers experience during management of clubfoot.
5. To explore the experiences of caregivers regarding medical management of clubfoot.

In the current study, predetermined themes as well as themes that emerged from the interviewed subjects were developed based on the above objective of this study.

4.1. SOCIO-DEMOGRAPHIC CHARACTERISTICS

Social demographic data demonstrate the characteristics of the participants who took part in the current study. These features of the participants are presented in table 4.1 and 4.2. Table 4.1 presents the service providers (SP) who are basically the health care providers that were involved in clubfoot management at the three talipes clinics. The table also demonstrates the characteristics of the service providers that were considered in purposive selection of the participants which includes; gender, age, occupation and method of management used by the service providers. Ten service providers participated in the study from the three hospitals. Four were recruited at Mbagathi District Hospital, four recruited at Kenyatta National hospital and two at Kijabe mission hospital.

Table 4.2 presents the parents/caregivers of children with clubfoot. These were either biological parents of the children with clubfoot or relatives who where trusted with the responsibility of taking these children to the health facilities for treatment. The study sample of the parents/caregivers (CG) was by age, occupation, relationship to the child and the method used to manage the clubfoot. All the parents/caregivers were female. Ten parents/caregivers took part in

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the study in the three hospitals. Four were recruited at Mbagathi District Hospital, four recruited at Kenyatta National hospital and two at Kijabe mission hospital. Eight participants that took part in the study were biological mothers while two of the participants were caregivers.

Table 4.1 Socio-demographic profile of the study participants

Service providers

Participant code	Gender	Age in years	Occupation	Type of method used by the SP
SP 1	Male	47	Orthopaedic Surgeon	Ponseti and surgical method
SP 2	Male	26	Orthopedic Technologist	Ponseti method
SP 3	Male	42	Occupational Therapist	Ponseti method
SP 4	Female	36	Counselor	Ponseti method
SP 5	Female	30	Counselor	Ponseti method
SP 6	Female	29	Physiotherapist	Ponseti method
SP 7	Male	32	Occupational Therapist	Ponseti method
SP 8	Female	48	Physiotherapist	Ponseti method

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SP 9	**Male**	**50**	**Orthopedic Technologist**	**Ponseti method**
SP 10	**Male**	**44**	**Orthopaedic Surgeon**	**Ponseti and surgical method**

Table 4.2.Parents/Caregivers

Participant code	**Age in years**	**Occupation**	**Relationship to the child with clubfoot**	**Type of management method use**
CG 1	**24**	**Student**	**Parent**	**Ponseti**
CG 2	**32**	**House wife**	**Parent**	**Ponseti**
CG 3	**26**	**House wife**	**Parent**	**Ponseti**
CG 4	**35**	**House wife**	**Parent**	**Ponseti**
CG 5	**31**	**House wife**	**Caregiver**	**Ponseti**
CG 6	**25**	**Physiotherapist**	**Parent**	**Ponseti**

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CG 7	**30**	**House wife**	**Parent**	**Surgical**
CG 8	**32**	**House wife**	**Parent**	**Ponseti**
CG 9	**25**	**Secretary**	**Parent**	**Surgical**
CG 10	**34**	**House wife**	**Caregiver**	**Ponseti**

From the information presented in the social demographic data, it is clear that management of clubfoot is not a responsibility of one cadre but is undertaken by various discipline of the medical team. In this study, the various disciplines work together using the interdisciplinary approach to correct clubfoot and provide social and psychological support. This concurs with a study done by Ponseti et al. (2009) on clubfoot in Uganda; they found that clubfoot management involved the clinicians and the rehabilitation team.

Also presented in the social demographic data are the characteristics of the parents/caregivers. It is evident that clubfoot can affect a child of any parent irrespective of the age and professional background. However, the professional background, age of the parents/caregivers and relationship to the child with clubfoot does not affect the treatment seeking behaviour for their children. This is contrary to a study conducted in the United States by Parker et al. (2009), the authors found that maternal age, parity, education, and marital status were significantly associated with clubfoot.

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Outcome of the study also shows that the parents/caregivers who took part in the study were all women. The feminine gender dominance in this study concurs with the observation made in a study conducted in Uganda on parents/caregivers who took their children at an outpatient treatment clinic for clubfoot management (Kazibwe, 2006). A similar study by Kadzin and Wassell (1999) in USA found that out of 200 parents/caregivers, who took part in a study on barriers to treatment participation reported that majority of them were mothers or female relatives. The result of the social demographic data of the current study implies that mothers/female relatives are more committed and/or available in seeking treatment for their children as opposed to their male counterpart.

4.2. DEVELOPMENT OF THEMES

Themes of the current study were predetermined based on the objectives of the study and the available literature on perceptions as regards to clubfoot management. Similarly, the study elicited some informative first-hand insights from the service providers and the parents/caregivers with regard to management of clubfoot. The emerged insights formed a category of the third predetermined theme. The predetermined themes formed three main aspects on perceptions on clubfoot management. The discussion is therefore based on the three aspects.

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1. Perceptions on methods of management of clubfoot.
2. Procedures in Ponseti and surgical Management of clubfoot.
3. Barriers and facilitators in clubfoot management.

4.2.1. Perceptions regarding Medical Management of Clubfoot

Both the service providers (SP) and parents/caregivers (CG) when asked to express their experiences regarding different methods used to manage clubfoot; they mentioned the methods

of management as follows: Ponseti Method and Surgical method. The issues with the methods of management presented four categories. These categories are going to be discussed in-depth where both SP and CG will express their views and will be linked to the available literature.

4.2.1.1. Ponseti method

During analysis of data, the interviews elicited four sub-categories of Ponseti management. The emerged sub-categories will be discussed where the service providers and parents/caregivers give their views.

(a) Positive aspect of Ponseti management

Ponseti is a method of clubfoot management by manipulation and serial casting. During data collection, there was a wide variation in the participants' expressions about this method, but they all stressed on the ease and the effectiveness of using the ponseti management. Most respondents perceived Ponseti method as the most effective method of management of clubfoot. They associated this method with very good results and lower levels of recurrence. There were no negative feelings on Ponseti management from the participants. For example one service provider stated:

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> *"The Ponseti method is workable, we have done it for six years and we have no regrets. I feel that Ponseti method is the best way to go at the moment" (SP2).*

While a parent/caregiver commented:

"*…but in this facility there are people who are specialized in clubfoot. The method they use is good. If you look at these child's feet you would never know that he had clubfoot*" *(CG8).*

Several studies have shown that Ponseti method is practiced in Africa and in other parts of the world and that it has proven to be very successful (Konde-Lule et al., 2005; Ponseti et al., 2006; Pirani, et al., 2009). These sentiments are in consensus with Harold (2011), he found that Ponseti method had proven to be successful in correcting clubfoot fully around the globe, in both industrialized countries and developing nations. Ponseti management was viewed to have better outcome and was associated with improved quality of life, reduced risks of disability and reduced psychological and emotional trauma (Pirani et al., 2009). Similarly, a study by Lehman et al. (2003) showed that ponseti had a high rate of success rate which ranges to 90%. This was further supported by Harold (2011) view that clubfoot deformity can be successfully managed by the Ponseti approach.

So, both participants (SP and CG) of this study and Pirani et al. (2009); Harold (2011) and Konde-Lule et al. (2005) are complementing Ponseti method. In addition, the parents/caregivers are saying that they have seen a difference in their children ever since they started receiving Ponseti management. Similarly, the service providers are reporting that the numbers of relapses are getting less. In Kenya, where the study was conducted, the majority of the service providers are now embracing the Ponseti management while a few service providers are still holding on to the old methods.

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(b) Costing of Ponseti method

Expenditure for health care represent nearly one-seventh of most nation's GDP globally. This continues to be one of the fastest growing components of several countries budget due to high cost of treatment (Cohen, 2007). However, despite all odds, Ponseti management has proven different. It was reported to be cheap and cost effective. Most participants (n=13) reported that this method used the locally available material such as plaster of Paris and water, and that this

could be done anywhere. Therefore, Ponseti method could be made available to all parts of the country. On the contrary, a few parents/caregivers reported that this method was quite expensive since they had to travel long distance weekly in order to attend the clinics. This was expressed in the following speech marks:

> "*The second thing is, using things that are cheaper such as plaster of Paris and soft burn are efficient in the fact that you do not end up using as many cast as you would have in many of the other methods" (SP1).*

> "*…okay coming to this place all the way from Gatudu is not easy, it takes time and money" (CG7).*

Researchers have drawn our attension to the fact that the cost of treatment of clubfoot does not only have an impact on the parents/caregivers, but it also affect the sustainability of service provision (Pirani et al., 2009; Ponseti, 2005; Konde-Lule et al., 2005). This method was using the locally available material for casting while the foot abduction braces were made using simple equipment and cheap materials that were readily available. However, this findings were contrary to the results presented by Halanski, Huang, Walsh and Grawford (2009) who in their study indicated that the cost effectiveness of the Ponseti method had not been effectively demonstrated. The authors argues that besides the use of cheap material for clubfoot management, there were other factors that affected the consumer of the services hence affected the cost of treatment. Therefore the cost effectiveness of ponseti could not be ascertained.

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It is evident that service providers in the current study and Pirani et al. (2009); Ponseti (2005); and Konde-Lule et al. (2005) are agreeing that Ponseti method is cheap and cost effective as it utilizes the locally available materials. However, the parents/caregivers are arguing that Ponseti management is quit expensive due to the transportation cost to and from the hospitals. The

difference in these perceptions could be due to a number of reasons. Firstly, the study sample of the current study and that of Pirani et al. (2009) were markedly different. The current study investigated perceptions of service providers and parents/caregivers, whereas Pirani et al. (2009) investigated perceptions of health professionals. The service providers were looking at cost incurred to deliver services while the parents/caregivers are viewing Ponseti with a different lens. They are looking at cost in terms of the process of transporting the parents/caregivers to the health facilities, treatment and back. Parents/caregivers are saying that Ponseti management is still expensive for them besides free services offered in most of the health facilities since they have to incur the cost of travelling long distance to the health facilities. In Kenya where the current study was done, the service providers have started introducing management of clubfoot at the district hospitals since the government and CCK can provide resources for treatment, still, a majority of the parents/caregivers are not contented citing that most of the district hospitals are in urban centres and are still not accessible to most of the people living in rural areas.

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(c) Time of Intervention

Early intervention in health care determines the future health and social wellbeing of an individual (Straus et al., 2006). This factor was not exceptional with Ponseti, it was observed to be most effective with early intervention and compliance (Noam, Herzenberg & Frick 2006). Most of the participants (n=15) felt that this method yielded good results when treatment is started before a child is two years of age. The service providers emphasized that for effective treatment of clubfoot, the intervention should be started as early as one week after birth. However, a minority of the service providers (n=2) and parents/caregivers (n=2) felt that early treatment was mired by missed diagnosis and poor referral system. They reported that some children were delivered at home or at health facilities where clubfoot was not diagnosed while

other children were referred to centres where clubfoot was poorly managed. The following statements epitomized this:

> *"So the results are positive with early intervention and good compliance" (SP6).*

> *"Imagine they had applied the plaster for six months. I had been going there for six months yet with no improvement" (CG2).*

Early intervension in diseases/conditions management is very vital and prevents the development of complications. Noam et al. (2006) pointed out that Ponseti management is most effective when performed immediately after birth as the collagen fibres can stretch easily without causing pain to the child. The above authors found that non-operative treatment of clubfoot was widely accepted as the initial standard of care and should be started as soon as one week after birth. Furthermore, Sud, Tiwar, Sharma and Kapoor (2008) also showed that most orthopaedic surgeons had agreed that the initial treatment of patients with clubfoot when presenting early in life should be conservative management.

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So, participants in the current study and Noam et al. (2006); Sud et al. (2008) and Mootha et al. (2011) approves that the best outcome of clubfoot management is achieved with early intervention. However, a few parents/caregivers (n=4) argued that for early intervention in clubfoot management, there are several factors that come into play which may positively or negatively affect time of intervention. These include early diagnosis and correct referral. In Kenya, the ministry of health in collaboration with clubfoot Care Kenya is ensuring that all the health care workers that are involved with child birth as well as the traditional birth attendants are trained on assessment and diagnosis of clubfoot. Also included in the training is the referral centres for clubfoot management. With this strategy, there has been a reduction in the number of

missed diagnosis in the three facilities while there is increase in clubfoot cases being admitted at these talipes clinics. This has been reported in the annual report in the ministry of health. However, there is paucity of published literature with regard to this issue.

(d) Convenience of Ponseti method

All the service providers perceived Ponseti method as a management that is available to many people and could be offered by various disciplines in the health profession. Service providers revealed that with this method, it takes away clubfoot management from the surgeons to other disciplines. These disciplines include the rehabilitations officers such as the physiotherapists, the occupational therapists, the orthopaedic technologists and plaster technicians. Service provider 3 an orthopaedic technologist commented:

> "*Rehabilitation officers are available everywhere and they can do a good job because the Ponseti method is easy to learn*" *(SP3.)*

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While parent/caregiver suggested that:

> "*With this kind of treatment, it makes our work easy, we do not have to go all the way to Kijabe for the operation*" *(CG5).*

Availability of treatment services affects utilization and adherence to the treatment regime. The above sentiment was supported by a study by Lehman et al. (2003). The authors found that Ponseti method is easy to learn by paramedics and therefore can be provided in all health facilities. A similar study by Harold (2011) found that in many settings, non-physician practitioners were primarily responsible for the casting phase of treatment, particularly in areas with shortage of physicians. This was further sustained by the findings of Pirani et al. (2009) who argued that training paramedics on Ponseti management resulted in early treatment of

children with clubfoot in areas that have no access to specialised health care and particularly in developing countries where there are few orthopaedic surgeons.

The participants and Lehman et al. (2003); Ponseti (2005); Pirani et al. (2009) and Harold (2011) are found to agree on the fact that the Ponseti method is convenient, and can be delivered by paramedics. This makes it available in most parts of the country. In addition, the parents/caregivers are saying that they can access the services in some of the district health facilities closer home. In the setting of the current study, Ponseti services are made available by allied health workers and are currently available in almost all the district hospitals hence an increase in the number of children attended.

4.2.1.2. Surgical method

Surgical method entails posterior release, posterolateral or posteromedial release (Hogue et al., 2001; Macnicol, 2003). This method was reported to be the second most utilizes in clubfoot management. Most of the participants (n=13) reported that surgical intervention was utilized with the neglected and complex cases. Respondents further added that the method was likewise used for patients that could not access Ponseti method. One parent/caregiver said:

> *"... Until four years when we came to the hospital and the doctor operated on him" (CG8).*

One orthopedic surgeon expressed:

> *"But then, there are those who come with neglected clubfoot or those that live so far away that they do not have access to the Ponseti method of management of clubfoot, so we offer surgery for those cases" (SP1).*

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According to Khan and Chinoy (2006); Sureh et al. (2003) and Hogue et al. (2001), surgical management is the best method to achieve the functions of the foot in complex and neglected clubfoot. The authors assert that surgical intervention is prompted by the presentation of patients with neglected clubfoot months or years after birth. So, the service providers and Khan and Chinoy (2006); Hogue et al. (2001) and Sureh et al. (2003) are assenting to the fact that surgical approach is endorsed for neglected and complex clubfoot while parents/caregivers are saying that the children with clubfoot are taken through surgery when they present to the talipes clinic after two years. Additionally, the service providers are considering surgery for clients who cannot access Ponseti method, and therefore may not be able to adhere to Ponseti protocol. In Kenya, there are only thirty-seven Ponseti clinics, which have prompted the use of surgical intervention for clients that cannot access Ponseti management.

(a) Shortcoming of the surgical management

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Surgical method was reported to be associated with a lot of challenges (Ponseti, 2006). It was reported that most of the parents/caregivers could not afford surgery while at the same time it costs a facility a lot of money for an operation. Additionally, the service providers explained that there were very few surgeons in the country to offer surgical services. Similarly, surgery was also said to have many post operative complications, this included pain, stiffness and scars, muscle wasting and anatomical changes. Two participants responded as follows when probed on challenges of surgery:

> *"It requires a lot of facilities and then there is the admission part and then the follow up part. So this is very expensive both for the patient and for the country" (SP6).*

"...you see, after the operation, this child has always complained of pain around the ankle joint" (CG9)

Several studies have suggested that surgery should not be the first line of management of clubfoot (Dietz et al., 2009; Ponseti et al., 2006; Ippolito et al., 2003) which is in agreement with the finding of Go¨ksan, Bursalı and Bilgili (2006). The authors reported more conspicuous anatomical changes, significant muscle weakness and insufficient ankle range of motion associated with long-term outcome in patients treated with extensive surgical releases. This was further maintained by Ponseti (2005) in his experience while using the surgical method; he reported that while using the surgical method on relapses, he observed severe scars and stiffness of the ankle joints. The structures that were elongated after the first surgery were later matted and immobilized in a bulk of scar tissue. After many years of experience, it was discovered that surgery was not the right approach to clubfoot management.

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The service providers in this study and Go¨ksan, Bursalı and Bilgili (2006) are in agreement that surgery should not be used as the first line of management in clubfoot. Additionally the parents/caregivers are saying that children that have gone through surgery are left with residue complications or deformities. Currently, Kenya is minimally utilizing surgery in clubfoot management which has reduced the complication that comes with surgery. Additionally there has been reported reduction in number of pending cases on the waiting list for surgery. Despite paucity of proper records, it is envisaged that in ten years to come less than 3% clubfoot patients will be managed through surgery.

4.2.1.3. Traditional/kite method

As interpreted by few of the service providers (n=5), traditional/kite method refers to any conservative method that was used before the inception of the Ponseti management. Service providers reported that traditional/kite method was not commonly used at the three facilities. However, none of the parents/caregivers that were interviewed had a child managed by kite/traditional method. The service providers expressed difficulties with the traditional/kite method that resulted in its insufficiency in clubfoot management. One service provider said:

"…they end up having prolonged casting" (SP1).

While another one said:

"But you have to put a lot of cast to get good correction" (SP2).

This method was reported to have greater likelihood of relapses and poor result after a long period of treatment. These findings ties with a study by Sud et al. (2008) which revealed that while using kite method, there were higher chances of relapse. This method likewise showed a preponderance of varus of the heel, which indicated initial failure to correct the deformity completely. In Kenya, the kite method is not an approach advocated for clubfoot management and as a result very few service providers understand or utilize it for clubfoot management.

4.2.1.4. The French method

Very few service providers (n=3) appeared to know about the French method of management of clubfoot. The minority that knew this method described it as a method where the foot is manipulated and then restrained. There were no children managed by French method. The data revealed that French method is very tedious; parents/caregivers have to take their children to the

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facility every day for manipulation and immobilization. Service providers expressed their feelings as follows:

> "*There is the French method, where people manipulate the foot and they immobilize it*" *(SP1).*

> "*It is quite intensive because the people have to go to the hospital every day to have that, but it is there*" *(SP5).*

The challenge of lengthy treatment requires good cooperation from the parents/caregivers. Faulks and Luther (2005) assert that elongating, passive exercises and immobilization of the foot require time and commitment from parents/caregivers to bring the child for daily treatment sessions. Furthermore, Richards, Johnston and Wilson (2005) suggested that French method may not be adequate to manage in older babies. Nevertheless, in spite of its limitations, the French method has proven to have good outcome in new-borns (Richards et al., 2005). There is good results reported with the French method in Europe but no literature is available about its use in Kenya and other third world countries.

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The few service providers that knew the French method and the authors are in consensus that this method is tiresome and can only yield good result with commitment. French method is barely practiced in Kenya.

4.2.2. Processes in clubfoot management.

The study elicited some informative first-hand insights from the service providers and the parents/caregivers on the methods mostly used at the three facilities for clubfoot management. The insights formed two categories from which several aspects of management emerged. The discussion is therefore based on the two categories. These methods were indicated as falling into

Ponseti and surgical methods. The procedures of the two methods are going to be discussed in-depth and will be linked to the available literature.

4.2.2.1. Ponseti method

This method was reported to be the conservative treatment of choice for clubfoot at the three facilities. During data analysis, this method emerged to have had several stages. Therefore, below is an exhaustive discussion of the various procedures that entails Ponseti management.

4.2.2.1.1 Registration

Patient registration is the concept and set of methods needed to correlate the reference position of a virtual dataset gathered, and forms the reference position of the patient (Eggers & Marmulla, 2006). Registration facilitates recording of data about a patient and the health status of patients in a problem-solving system (Eggers & Marmulla, 2006). Most of the participants (n=17) reported with ease the stages they went through during registration of the patient as expressed in these speech marks:

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"Then if we see that the client is a candidate for clubfoot, we send them back for registration" (SP7).

"We were sent to Mayaka for registration" (CG6).

During registration, the service providers reported that they open a file and document the particulars of the client. Most service providers (n=8) explained that registration was vital as it provided all the necessary information about a patient when needed and the weekly review notes (Nash, 2012; Scuibba, 2001). The weekly notes were therefore imperative in monitoring the progress of the child through the entire treatment, as well as being vital for referral for further

management in the same institution or in other institutions. All the service providers reported that during registration of the client, they took proper history. This was expressed in the following responses:

> "*Okay, normally, during the assessment we get the details of the patient background, we also find out if there is a member of the family who has clubfoot*" *(SP7).*

> *"…and then they asked me if the child was born like this, if the kid had other problems and many other questions*" *(CG6).*

The service providers who were approached explained that the aim of taking proper history from the parents/caregivers was to assist the service providers in planning for physical assessment and treatment. This was consistent with Nash (2012) who recommends that it is important to obtaining a proper patient's medical history. As previously mentioned by Nash (2012) history taking is important in notifying the clinician on patients that are contraindicated to certain kinds of therapy.

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The expressed need for history taking by the service providers was a typical universal need for any medical condition prior to assessment and management (Scuibba, 2001; Nash, 2011). The parents/caregivers also expressed the fact that prior to treatment; they were taken through a thorough interview by the service providers. This implies that in Kenya, the service providers are conforming to the laid down protocol of assessment prior to management of clubfoot, hence their realization of the importance of taking time to ask details about the illness. Treatment process also confirms that history taking will assist in rehabilitation

4.2.2.1.2 Physical assessment and referral

Assessment is the evaluation of the disease/condition based on the client's subjective report and the health care provider's objective findings, including results from laboratory tests and medical history (Mosby's Medical dictionary, 2009). The service providers reported that they did whole body physical assessment. They explained that there was need for a thorough physical assessment of the child as some of the clubfeet were complications of other conditions such as hydrocephalus and Arthrogryposis. The participants expressed the following:

> *"So we assess the upper extremities, check on the spine, check on the hip, check on the lower extremities and see whether there are other deformities" (SP2).*

> *"Prior to plaster application they did an assessment, no! They measured the legs, I don't know what they called it but they did some assessment" (CG1).*

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Most of the service providers (n=8) explained that in cases where clubfoot had other underlying conditions, they referred the clients appropriately such as to a neurosurgeon or an orthopedic surgeon. The following were expressions of the participants:

> *"If there is anything that we note that is beyond our intervention, we refer accordingly." (SP2).*

> *"Then we were referred to Kijabe because of the problem at the back" (CG5)*

However, two service providers reported poor referral in Kenyatta National Hospital and attributed the problem to the fact that the facility was putting a lot of emphasis on improving revenue collection. They explained that every department had been allocated a specific monthly

financial target to meet. For this reason, the respondents said that the service providers had to hold on to patients regardless of their inadequacy in management in order to meet their target. The following were elicited by the participants:

> *"...we hold on to patients regardless of whether we can manage the condition or not" (SP2).*

> *"We went to the hospital for 5 month without improvement. Then we were told to go to Kijabe" (CG4)*

The informants added that the poor referrals had lead to mismanagement of clubfoot since a few of the service providers were using the old method.

In diseases/condition management, referral is a very important component; it enhances timely management and avoids complications. The above sentiments were in consensus with the finding of Sulowicz and Stompor (2004) in a study of hemodialysis and nephrons. The authors suggested that it is important to identify a condition and refer to the most appropriate specialist to avoid further complication. A similarly study by Bowles, Naylor and Foust (2002) on a research concerning the referral of geriatrics to home care revealed that poor referral led to poor outcomes. This was further sustained by Schwenger et al. (2005) in their study of dialysis in elderly patient, they established that poor referral accounted to a large propotion of mortality. The service providers and Sulowicz and Stompor (2004); Bowles et al. (2002) and Schwenger et al. (2005) are saying that there is need for proper referral for effective and early intervention in clubfoot management. On the contrary, some of the parents/caregivers are reporting poor referral which has dalayed management. Although there are no proper documentation on the effects of poor referral in kenya, delayed referral lead to prolonged duration of management, increased cost

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of management and disability that are associated with clubfoot. Additionally, poor referral has lead to loss of confidence by parents/caregivers on the service providers.

4.2.2.1.3 Localised assessment , scoring and classification

Localized assessment in clubfoot refers to assessment of the feet (Staheli, 2009; Ponseti et al., 2003; Pandey & Pandey, 2003). Scoring (Pirani score) refers to a simple, easy to use tool for assessing the severity of each of the components of a clubfoot. Scoring is useful for assessing the severity of the clubfoot at presentation and for monitoring patients' progress. If the Pirani score increases from one visit to the next it may indicate that a relapse of deformity is occurring and vice versa (Pirani et al., 2009; Staheli, 2009; Ponseti et al., 2003). Classification is the categorization of the amount of the deformities present in clubfoot. It provides a scientific basis for the clinical treatment of different types of clubfoot. It establishes the prognosis and helps in planning management (Pirani et al., 2009; Staheli, 2009; Ponseti et al., 2003).

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The study indicated that after the entire body physical assessment, the service providers did a local assessment and classified the feet which defined the method of management as expressed in the following speech marks:

> *"Okay, depending on the assessment and also classification on what type of clubfoot it is, help us on how to manage the child" (SP9).*

> *"The doctor looked at the feet and said it could be postural clubfoot" (CG1).*

After classification, the participants were in agreement on the score of the feet. There was consensus as to the use of Pirani scale for scoring of the foot. Most service providers (n=8) explained that Pirani scale was used to document the amount of deformity and allowed the

service providers to know where they were with respect to management. From the scoring, processes such as tenotomy would be indicated and thus the need to reassure parents/caregivers regarding progress as expressed below:

"…we use the Pirani scale for scoring" (SP1).

"They looked at the feet and wrote on the assessment form" (CG5).

These findings were in harmony with Pirani et al. (2009) who recommended the use of Pirani scale in an attempt to classify the severity of the deformity. After the assessment, the service providers reported that the child was ready for management.

In the current study, the service providers are using the Pirani scale for assessment and categorisation of clubfoot which is in agreement with Pirani et al. (2009). Pirani scale has been used globally as well as Africa and most importantly the East African countries of which Kenya is one of the member countries. This implies that Kenya is conforming to the use of the right tools for clubfoot assessment which has resulted to correct diagnosis and classification and hence right treatment.

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4.2.2.1.4 Counselling

Counselling is an approach that facilitates a person to reorganize issues and make decisions affecting their life. Counselling entails talking with a person in a manner that helps one sort out issues or that helps to create circumstances that will assist one to understand and/or improve his behaviour, character, values or life circumstances (Huber et al., 2012; Ding et al., 2012; Zimmermann, Thompson & Persell, 2012). All the service providers were in consensus that the parents/caregivers needed counselling prior to commencement of treatment. They held that

counselling helped the parents/caregivers understand clubfoot and its management. During analysis of data, counselling was found to entail education on the clubfoot and the treatment process.

All the service providers explained that education helped the parents/caregivers understand clubfoot and everything that is associated with clubfoot. This was expressed in the following quotes:

> *"So we prepare them very well prior to the start of treatment. We sort of educate them" (SP3).*

> *"First we were taken to a counsellor who taught us about clubfoot" (CG5).*

Counselling was also reported to be important as some of the communities were reported to have some traditional believes that clubfoot was as result of a curse. Some said that it was the will of God to get a disabled child and therefore no need for treatment. Other communities attributed clubfoot to family planning methods used by the mother prior to conception. One service provider said:

> *"There are other parents with some traditional and superstitious thought about clubfoot" (SP3).*

While one caregiver said:

> *"So to them, the problem came as a result of a curse or my not attending the traditional midwife clinic" (CG3).*

Most participants (n=15) mentioned that on several occasions, mothers were chased away from their matrimonial home after giving birth to a child with clubfoot. Similarly, men were also seen

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to blame the family of the mother for bringing disability in to their family. Most of the service providers (n=8) explained that education on causes of clubfoot was an important aspect of counseling and was reported to facilitate compliance. Therefore, the service providers were proactive in recommending education on clubfoot prior to management.

Furthermore, few of the service providers perceived management of clubfoot like a journey that takes a long time to achieve correction. It required commitment, determination and discipline (Richards et al., 2005). Service providers felt that it was important for the parents/caregivers to be psychologically prepared before taking up the challenge as expressed in the following quotes:

> *"…explain to the parent or the guardian what we are about to do, because as you know, the management of clubfoot begins from three weeks to four years of age. So you have to make sure that the parent, guardian or whoever has the child understands the management and that is how we get their commitment" (SP2).*

> *"He talked to us about clubfoot, the duration of time it takes to have the feet corrected, what we are supposed to do as parents and the challenges expected along the way"(CG2).*

Counseling, as explained by most of the service providers included learning about the duration within which the child will be managed, the role of the service providers and most importantly the role of the parents/caregivers of children with clubfoot.

In clubfoot management, adherence to the treatment regime is as important as the correct management (Staheli, 2009; Docker et al., 2007). This can only be achieved by bringing the parents/caregivers on board through counselling and education (Huber et al., 2012; Ding et al., 2012). A study by Scott and Evans (1997) on clubfoot management in Tanzania found that most

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of the children with clubfoot that were treated using the Ponseti management were lost to follow-up before achieving satisfactory results. This indicated that compliance to treatment that involves consecutive attendances can be challenging.

Similarly, Ravasco, Monteiro-Grillo, Vadal and Camillo (2005) in a study to investigate the impact of dietry counseling in cancer patient found that counseling had higher benefits in relation to the way cancer patients fed. It was established that counseling was the only way to sustain patients outcome during radiotherapy period. Moreover, philosophers have suggested that discrepancy between the parents/caregivers and therapists' expectations for management may result to discontentment with services resulting in poor adherence to management regime (McCabe, 2002). Therefore, counselling is very imperative in clubfoot management.

Several studies, Huber et al. (2012); Ding et al. (2012) and Zimmermann et al. (2012) are saying that counselling is universaly neccesary in medical management of conditions/disease. This is in agreement with the service providers who are counselling the parents/caregivers. The service providers are reporting increase in compliance with the clubfoot treatment regime after counselling of the parents/caregivers. Similarly, the parents/caregivers are reporting that through counselling, they were empowered with the knowledge about the clubfoot and that they familiarized themselves with the treatment process. This facilitated realistic expectation on how long the management would take and to what extend they were expected to participate. Currently, there is an increase in awareness on clubfoot and the information is now going down to the community as the parents/caregivers are taking up the responsibility of educating their peers as reported by the service providers. However, no proper documentation is available from the ministry of health in Kenya. This has prompted a marked reduction in stigmatization of parents/caregivers of children with clubfoot.

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4.2.2.1.5 Manipulation, serial casting, tenotomy and bracing

Manipulation refers to treating or operating with the hands or by mechanical means especially in a skilful manner to bring back the correct position (Ponseti, 2005). Casting refers to giving a shape by pouring plaster of Paris into a mould and letting it harden with an aim of maintaining position (Ponseti, 2005). Most of the service providers (n=9) explained that treatment started with manipulation which was intended to achieve the correction of the foot.

There was consensus among respondents that after manipulation, they use a cast to maintain the correction for one or two weeks as expressed below:

"After the manipulation we do the casting" (SP7).

"The child was put on a weekly cast" (CG6).

Most service providers (n=7) explained that manipulation and casting were gradual and the changes of the foot were painless. Weekly casting allowed the tendons and ligaments around the ankle joint to stretch and give way to further manipulation of the tarsal bones (Staheli, 2009). This ties with Ponseti (2005) study which showed that the many young collagens in the ligaments were curly, very cellular and could be easily elongated without causing a lot of discomfort to the child.

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Service providers further reported that casting was applied "full cast" with the knee in 90 degrees flexion. This was done to ensure that there is total immobilization of the correction done at the ankle joint. Casting was reported to be done weekly. The service providers reported that they removed the cast and assessed the progress of the foot through scoring. Participants explained that for a normal clubfoot, they applied between five and eight weekly casts as expressed in the following quotes:

"We used to go back every week where they used to remove the plaster and put another one" (CG2).

"The cast is applied weekly or after every two weeks for five to eight weeks" (SP1).

Each cast was said to show improvement from the previous one. The respondents further added that the number of casts applied for correction of the foot was dependent on time of intervention and the severity of the deformity.

The results of the current study are in agreement with Judd (2004); Morcuende et al. (2004); Frick (2005) and Scher (2005) which showed that during the second stage of Ponseti management, the deformity is corrected by serial casting. The treatment phase involves gradual correction of the foot, through stretching shortened structures, followed by plaster casting to maintain the correction that is achieved. The authors found that this procedure was done every week for five to eight weeks depending on severity of the feet.

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The service providers at the three facilities are following the recommended Ponseti method of manipulation and serial casting which is in agreement with Morcuende et al. (2004); Frick (2005) and Scher (2005).While the parents/caregivers testified to the fact that their children received weekly casting, they are reporting weekly improvement after every casting. This implies that Kenya, where the current study was done is meeting the requirements of the procedures of Ponseti management and is reporting improvement in the quality of services.

4.2.2.1.6 Tenotomy

This refers to surgical cutting or division of a tendon (Merriam- Webster Medical Dictionary, 2007). In clubfoot management, tenotomy is the incision of the tendoachillies (Ponseti et al., 2006; Pirani et al., 2009). Service providers reported that there were children that remained with resistant residue such as rigid equinus after manipulation and casting. Service providers were

proactive in making recommendations for tenotomy for such cases. They revealed that tenotomy was possible since the Achilles tendon, unlike the ligaments of the foot, is made up of thick, non-stretchable fibres and capable of growing back to the normal stretch (Ponseti et al., 2006; Staheli, 2009). Service providers explained that after tenotomy was done, an extra 10 to 15 degrees of dorsiflexion of the foot was mostly achieved. A cast was then applied for three weeks after which braces were initiated. The following responses were elicited from the participants:

> *"When they reach a certain stage and the child is ready for tenotomy (the tendoachillies tenotomy), we do it and cast, but now the cast stays for three weeks" (SP1).*

> *"We went to Kijabe for tenotomy and after tenotomy they applied plaster which stayed for three weeks. After three weeks the child could now step down properly" (CG4)*

Immobilization of the foot in dorsiflexion ensured the growth of tendoachillies to the normal stretch. Scher, Feldman, van Bosse, Sala and Lehman (2005) suggested that after tenotomy is done, a cast should be applied for three weeks followed by bracing.

The service providers and Ponseti et al. (2006) and Staheli (2009) are agreeing that tenotomy should be done to eliminate rigid equinus after which the feet are on cast for three weeks. Likewise, the parents/caregivers are reporting that after tenotomy, there is improvement on the foot and they can walk well.

4.2.2.1.7 Bracing

Bracing refers to the use of special shoes (braces) (Scher, 2005). A brace consists of a pair of leather open toe boots attached to a fairly lightweight metal bar (Ponseti, 2005). The braces are used for immobilization of the correction achieved during casting phase (Ponseti, 2005). The service providers reported that the abduction braces were applied immediately after the last cast

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or three weeks after tenotomy. They further added that the braces were used for immobilization of the correction achieved during casting phase or after tenotomy. One parent/caregiver said:

"So last week we came and we were given the braces." (CG4)

While one service provider said:

"The third stage of our management is the bracing. This is where we use the foot abduction braces to maintain the correction that has been achieved during casting" (SP6).

Few service providers reported that in cases where one foot has clubfoot, the brace is set at 75 degrees of external rotation and 45 degrees of external rotation on the normal foot. In bilateral cases, the braces are set at 70 degrees of external rotation on each foot. The participants advocated that the bar should be of sufficient length to ensure the heels of the shoes are at shoulder width. This was in agreement with Pirani et al. (2009) who in their study suggested that the length of the metal bar connecting the braces should be the same length as the distance between the shoulders. Informants further reported that the brace should be used full time for the first three months after removal of plaster or tenotomy. One service provider summed it up as follows:

"Initially the braces are applied for 23 hours day and night with a one hour break during which the child is bathed and the manipulation done" This takes place for a period of three months."(SP2).

One parent/caregiver said:

"At the moment we are having the braces for 23 hours with one hour rest."(CG6).

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After the 3 months, the service providers explained that the child should apply the brace for 12 hours at night up until the child is 4 to 5 years of age. This was highlighted by responses such as:

> *"We put the shoes in the day and the braces at night. So during day time no braces, you put the normal shoes." (CG1).*

> *"After the three months day and night, the client progress to using the braces only during the night and using normal shoes during the day" (SP7).*

Bracing is crucial after correction has been achieved and are applied for a longer period of time, failure to adhere to bracing prompts relapse of clubfoot. This was in line with Ponseti (2005) who argues that the genes that caused clubfoot defect are active from the 12th to the 20th weeks of foetal life and active until 4 to 5 years. With Ponseti method of clubfoot correction, the joint restructure gets in their normal position and the congruency is sustained to the age of 4 to 5 years (Ponseti, 2005). On the contrary, Sud et al. (2008) in a study found that clubfoot deformity tends to relapse until the child is about 7 years of age.

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The practice of the service providers during the first and second phase of bracing at the three facilities differed somewhat with the Ponseti management. The authors suggested that the child should use the braces for 24 hour for a period of three months followed by 12 hours in the night and 2 to 4 hours in the middle of the day for a total of 14 to16 hours during each 24-hour period. This protocol continues until the child is 3 to 4 years of age. On the contrary the service providers at the three facilities were applying the braces for 23 hours during the first three months followed by application of the braces during the night for 12 hours. They argue that the child needed one hour of bathing and manipulation. Despite the difference, the parents/caregivers are reporting good results with this management. The difference in management could be due to

a number of reasons. Firstly, a few of the service providers were not properly trained on Ponseti management, but had learned the skills through apprenticeship. Secondly, the service providers may have altered the standard protocol in order to accommodate the challenges parents/caregivers encountered when using the braces during the day.

4.2.2.2. Procedures in surgical management

Surgical management is utilised in neglected clubfoot or complex clubfoot and in cases where parents/caregivers live far away from any health facility that could offer Ponseti management. The service providers reported that during surgical intervention, the client was admitted in the hospital, operated on and appropriate post-operative follow-up was done while in the hospital. Clients were later discharged to the nearest health facility for further follow-up as expressed in the following speech marks:

> *"So if we get them we admit them, operate on them then we discharge them to go home and then we follow them periodically after surgery" (SP1)*

> *"My son was admitted, and then operated after two days. Then we used to be seen at the mobile clinics" (CG9)*

According to Macnicol (2003), the patients were admitted and some special tests were done after which surgery commenced. Specific surgical procedure depended on the type and extent of the deformity. The children were done posterior release, posterolateral or posteromedial release depending on the deformity of the foot (Hogue et al., 2001; Macnicol, 2003). Additionally, tendon relocations of more active muscle groups could be done to balance the forces acting on the foot (Macnicol, 2003). Postoperatively, surgical wires, pins, and/or a cast could be used to

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maintain the corrected foot position until it has healed. Splints could also be needed for several months up to a few years after surgery (Lucile Parkard Children, 2011).

The participants and Hogue et al. (2001) and Macnicol (2003) are agreeing with the procedures prior to surgical management of clubfoot. However, the service providers are not explicit on the type of procedure they are engaged in during surgery as opposed to Lucile et al. (2011) and Macnicol (2003) which explains on the posterior release, posterolateral and posteromedial release. Similarly, the parents/caregivers are reporting that the children are admitted, operated and later discharged to the nearest health facilities for post-operative follow up. In kenya, surgical intervention is providing treatment for children who have difficulties in accessing health facilities that can offer conservative management. Besides having some post-operative complication, there is reduction in the number of neglected cases and disability from clubfoot.

4.2.3. Barriers and facilitators in clubfoot management

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This was a predetermined theme aimed at exploring the barriers and facilitators encountered by service providers in clubfoot management. However, two categories emerged from the interview as barriers and facilitators that affect parents/caregivers. Therefore, the researcher will discuss in details these influences in relation to the available literature. First, the category of barrier will be discussed followed by the category of facilitators as identified from the interviews of the professionals and parents/caregivers.

4.2.3.1. Barriers

Barriers were reported to be challenges that affected the service providers in delivery of timely and effective management in treating clubfoot. They were also reported as problems that affected

the parents/caregivers in accessing and receiving adequate and appropriate management of their children. Discussed below are a number of challenges that affected clubfoot management.

4.2.3.1.1. Missed diagnosis and lack of knowledge on clubfoot management

A question asked on whether the service providers were able to diagnose clubfoot at birth revealed that a few of them especially the nurses concentrate on delivery of the child. One service provider further explained that some of the nurses were not interested in assessing the child holistically; they just look at whether the child had been born normally and overlook the physical assessment which led to missed diagnosis in clubfoot. The following responses were educed from the participants:

> *"So we are saying that clubfoot is missed at birth by health professionals in many places. In fact if you see any clubfoot which comes late, it was missed at birth, because anyone who sees that this is clubfoot will refer immediately" (SP3).*

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> *"I gave birth at Kenyatta national hospital on 12th April 2011 and the nurse did not realize the child had a problem with the feet. So four hours later I realized that the child had a problem" (CG8*)

Similarly, some service providers were reported to manage clubfoot and children were left with residual deformities while others health care givers had no idea that clubfoot could be managed. Two parents/caregivers uncovered instances where the service providers were reported to instruct the parents/caregivers on what to do. This was confirmed by responses such as:

> "*We don't know if they are corrected, we just tell their mothers to be doing the foot like this*" *(SP7).*

"I was told that with time the feet will get well" (CG8).

The service providers are agreeing with Ponseti et al. (2009) who noted that few of the clubfoot are missed at birth either by the traditional birth attendant or by the health worker. In the current study, missed diagnosis could be presumed to be as a result of a big work load. In most of the cases, the healthcare workers are overwhelmed by the influx of the patients, therefore, service providers may have been in a hurry to attend to next patients and only assess the very basic things after the child is born and failed to identify clubfoot.

Missed diagnosis and lack of knowledge in clubfoot management has caused a delay in management and affected the period when the child is on manipulation and casting. Therefore, we found that this barrier led to neglected clubfoot causing disability from a condition that could be easily managed.

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4.2.3.1.2. Lack of knowledge on the referral

Few service providers revealed that in as much as most health care providers had knowledge on clubfoot; there was a deficit in the referral system. Minority of the parents/caregiver (n=3) reported being referred to service providers who seemed not to understand clubfoot management which resulted in children being treated for several months without improvement. One parent/caregiver expressed:

"*I had been going there for six months yet with no improvement" (CG2).*

One service provider said:

"There are still some health professionals who are not aware of where to refer these children" (SP3)

One parent/caregiver cited a case where she delivered at the hospital to a child with clubfoot and was referred for treatment to a plaster technician despite having talipes clinic in the same facility. In another instance, one parent/caregiver reported being referred to a talipes clinic in Kenyatta National Hospital. When she got to the facility; it took her 4 hours to locate the clinic as most of the health care givers did not appear to know whether there was such a clinic. The following expressions were elicited from the participants:

> "*In Kenyatta here, we were told to go to the orthopedic, occupational therapy, physiotherapy, it is like they did not know where we were supposed to go*" *(CG1).*

> *"In fact most of our clients are mismanaged in some other Centre and referred to as with the mismanaged feet later." (SP7)*

The findings of this study are contrary to Sulowicz and Stompor (2004) and Bowles, Naylor and Foust (2002) who advocates good referral system. It is clearly seen that some of the health care givers had knowledge on clubfoot. However, there was lack of awareness of the existence of the talipes clinic within and outside the three facilities which jeopardised the right referral.

Lack of awareness on the existence of the talipes clinic within the facilities may imply several things. Firstly, the number of children that had been successfully managed at the talipes clinic may not have been significant enough to capture the attention of most of the health workers. As a result health workers had no clue about the existence of the clinics in the hospitals. Secondly, it may imply that the service providers at the talipes clinic had not done enough sensitization within the facilities to educate their colleagues on clubfoot management and the availability of talipes clinics. Hence we find that lack of knowledge on referral can delay the intervention,

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prolong the period of management and increase the risk of complication and of disability that are associated with clubfoot (Staheli, 2009; Sulowicz & Stompor 2004; Bowles et al., 2002).

4.2.3.1.4. Shortage of trained staff on Ponseti method of management

One service provider reported that there were few trained staff on the Ponseti management of clubfoot and as a result there were very few talipes clinics in the country. The service providers attributed insufficient training to lack of finances and the fact that the government had not taken up the project holistically. Participants had this to say:

> *"We have not been able to train enough people" (SP1).*

> *"In most of the hospital you find doctors to treat adults, but in these hospitals there are no specialized doctors for children and most of all clubfoot. You see if Gatundu had specialized persons for clubfoot, the child would have been started on treatment the same day" (CG7)*

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On the contrary, most of the service providers reported that the challenge was not on the training, but on lack of resources. They explained that there were many service providers who had been trained on Ponseti management but were unable to practice in their respective institutions due to lack of resources and facilities. Participants expressed the following sentiments:

> *"The people who are trained are not really few, they are many but very few are practicing, there are people who were trained but cannot offers services due to lack of materials " (SP3).*

> *"At Thika, some of the doctors could treat the child, but you see, we had to buy everything for plastering. So at one point we could not afford and we had to stop" (CG7)*

Service providers reported that Clubfoot Care Kenya (A non-governmental organisation) was collaborating with the government in clubfoot management. The government provided the human resource while CCK trained the officers on Ponseti management and provided materials for clubfoot management in a few talipes clinics. Therefore, at the time of study, there were only 37 clinics sponsored by CCK though participants reported that there were many trained service providers in the government facilities.

One reason for the different responses from the service providers in regards to trained personnel was likely due to be the point of operation. The first service provider was responding at a managerial level and was well informed on the number of trained service providers in clubfoot management and the number required to sufficiently serve the nation. This is in agreement with Ponseti (2009) who indicated that in most African countries, there were shortages of trained health care providers in health facilities to offer Ponseti management. The second group of service providers were knowledgeable on what was happening on the ground, that there were service providers who had been trained but were not delivering services. These service providers who were trained and could not deliver services lacked resources. Therefore, we find that limited staffs who have been trained on Ponseti management and lack of resources affect service delivery at the local level and clients are likely to have less access to clubfoot management services at the community.

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4.2.3.1.5. Barriers to compliance by parents/caregivers during clubfoot management

In this study, barriers to compliance with the clubfoot treatment was considered as the challenges that affected the capability of the parents/caregivers to attend the clinic consistently every week or two weeks for management during the casting period at the talipes clinic for 4 to 8 weeks (Ponseti, 2003). Barriers to compliance also refer to problems that hindered the adherence to

bracing. When organizing for rehabilitation services especially for children with physical impairments in the third world countries, it is ordinarily assumed that these children and their parents/caregivers will comply with the rehabilitation services. Conversely, in real life, not always do all the children requiring assessment and management do attend (Whitworth et al., 1999). Moreover, even those parents/caregivers who do attend face various challenges, which are not well understood by the service providers and if not addressed, could negatively affect the utilization of rehabilitation services.

In this study, parents/caregivers reported a number of difficulties they encountered in complying with the treatment regime. These include financial constrain, long distance to health facilities, stigmatization and lack of family support. Therefore, below is a discussion of the difficulties encountered by the parents/caregivers in relation to available literature.

(i) Travelling distance

The results of the current study demonstrated the effect of distance on service use. The influence of distance becomes hard-hitting when considered together with lack of transport and bad roads, which contributed toward indirect cost of visit to health facilities. Parents/caregivers who travelled short distances reported that they were able to get to the health facility with ease and were more compliant to treatment. Most of the respondents that took their children to Mbagathi hospital reported to live in the city or areas that were accessible to the hospital. On the contrary, most parents/caregivers were reported to cover long distances from home to the health facility in pursuit of their children's treatment. Parents/caregivers that took their children to Kenyatta National Hospital and Kijabe Mission Hospital reported to have travel long distances to get to the facility. This was expressed by responses such as:

> "*…okay coming to this place all the way from Gatundu is not easy, it take time and money" (CG7).*

"There is a mother who used to come all the way from Muranga. She would travel for six hours and she made it to the end" (SP1).

This is because Kenyatta hospital is located in the city and caters for patients from all over the country while Kijabe is situated in the countryside and takes care of all the surgical and tenotomy cases from all over the country.

The distance covered to the health facility is related significantly with compliance to treatment. These results were supported by findings of Beardsley, Wish, Fitzelle, O'Grady and Arria (2003) in USA. The authors found that clients who travelled for short distances were likely to adhere and complete treatment as opposed to clients who cover longer distances. This indicated that as the expenses incurred during treatment attendance increases with distance, the ability of the patients to stay in treatment longer diminishes (Beardsley et al., 2003).

In Kenya, transportation expenses differ, it depends on the distance covered and the area. Most roads within the capital and urban centre are accessible while those in the suburbs and rural areas are inaccessible especially in the rainy seasons. This increases the costs of transport.

Data indicate that the geographic distance that parents/caregivers travel to the health facilities increases the cost of accessing health care service and has affected adherence to clubfoot treatment regime negatively. This is in agreement with Beardsley et al. (2003). This implies that there are people who need these services but have no access leading to neglected clubfoot. Participants suggested that decentralization of talipes services which might reduce costs od transport and improve accessibility.

(ii) Lack of finances

Kenyatta Hospital reported a few cases of non compliance. Two service providers explained that the clinic was not supported by CCK for some administrative reasons. Therefore, the

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parents/caregivers had to pay Sh1000 (R100 equivalent) every time during casting and Sh1500 (R150 equivalent) for the abduction braces. One of the service providers cited cases where parents/caregivers would come to the clinic without finances and would not get services at all. The service providers explained that the fee was not affordable for most of the parents/caregivers which affected compliance. This was expressed in the following sentiments:

"There are still patients who have problems to afford that. They cannot afford 1000" (SP3).

"…The major one is the financial problems. It is not easy to raise Sh1000 per week for treatment" (CG3).

Similarly, most parents/caregivers reported that it was expensive to take their children to the clinic for treatment. Majority of the parents/caregivers in the current study were not employed and therefore depended on their spouses or relatives. They revealed that they had no direct control over the finances that were essential for meeting the expenses hence had difficulty meeting the transport costs and payment for the services. This lead drop outs and went back for treatment when money was available. Few parents/caregiver revealed cases where they had to borrow or sacrifice other basic needs even though treatment at Mbagathi and Kijabe was free. This was evident by expressions such as:

"We talked to my parent in-law who gave us money to go to Kijabe for treatment" (CG2).

Most of these women are housewives and they depend on their husband for support" (SP7)

Parents/caregivers further expounded that if the spouse or relatives who provided finances was unable to raise the money for transport, the mother had either to borrow the money or fail to

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attend the clinic. This was in unanimity with Pirani et al. (2009) in a study on understanding clubfoot in Uganda. Pirani et al. (2009) found out that poverty was the major barriers to adherence to Ponseti treatment protocal in Uganda. Similarly, Staheli (2009) found that lack of finance to cater for the expense (transportation to health facilities) in developing countries can affect compliance with the treatment regime.

In the current study, most of the parents/caregivers came from informal settlements. They live in abject poverty due to high rate of unemployment. The parents/caregivers have to travel to the health facilities by use of motorbikes, a cab or walk to the hospital. This means of transport increases the cost of transportation which is not affordable to many. This is in agreement with Pirani et al. (2009). Lack of finance affects most parents/caregivers accessibility to the health facilities. These expenses can be minimized if the services are extended to the communities.

(iii) Stigmatization and lack of support

Several parents/caregivers identified a range of situations where stigma and discrimination occurred. Most parents/caregivers (n=7) explained that many people thought that women that gave birth to children with clubfoot had been cursed by witchcraft or were being punished. One participant described the myth that if a woman gave birth to a child with clubfoot, all her children were bound to be disabled. Most of these women avoided taking their children for treatment as they felt that treatment was a form of displaying their bad genes. Similarly, stigmatisation was reported to contribute in breaking families and reduced support for the mother and the child when a child with clubfoot was born. This in return significantly affected adherence to treatment appointment. Several informants (n=15) explained that when a child was born with clubfoot, fathers always blamed the family of the mothers. The participants expressed as follows:

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"Some of the communities believe it could be probably because of a curse and nothing can be done about it" (SP7).

"When he saw that the child had clubfoot, he disappeared never to come back" (CG6).

Informants mainly felt that stigma in the community was based on people being surprised about the inversion of the feet because they did not know about the condition. Participants reported that there was not enough sensitization on clubfoot and that was why community members did not know how to react. As a result, some parents/caregivers were reported to keep their children at home and miss treatment appointment to avoid ridicule. Additionally, children with clubfoot were also reported to experience "labelling". Some participants said that the children were sometimes called "kiwete" in Swahili, which is a derogatory term meaning disabled. They explained that to use the word in the context of labelling a child was offensive. Such terms used to explain clubfoot were discouraging to the parents/caregivers and negatively affected their adherence to treatment regime.

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The findings of this study concurred with the findings of Bedford (2009) in a study on clubfoot in Malawi. The author found that people used "*Kopindika mapazi*" which is a derogatory term in Chichewa referring to clubfoot. Clubfoot was often stigmatised by its description as *kupunduka*, "cripple". Such generic labels were oppressive and brought associations of permanent disability and abnormality and had the potential to deter treatment seeking behaviours and compliance to the treatment regime. All participants were proactive in suggesting a way out, stating that they should do more to promote public understanding about clubfoot.

The majority of patients/caregivers in the current study are saying that they experienced a range of negative behaviour or negative attitudes as a direct result of clubfoot. This stigma is said to

originate from both inside and outside the family. Parents/caregivers have faced divorce, reprisals and been ostracised. Fathers are said to be hardly interested with their children treatment and are largely disconnected from their children treatment which in agreement Bedford (2009). Stigmatization has ripped off the parents/caregivers financial, physical and emotional support that they desperately needed to keep the treatment appointment as prescribed. Similarly, the service providers are saying that most of the children presented at the talipes clinics are brought by their mother and more often, the mothers report being abandoned by the family members after having a child with clubfoot. Therefore, we find that stigmatization instilled fear in the lives of parents/caregivers; it also weakened the family/social support. This has negatively affected the adherence to the treatment regime and could lead to relapses.

4.2.3.1. Facilitator in clubfoot management

Facilitation in the current study refers to the support the service providers and the parents/caregivers received during clubfoot management (CBM, 2011; Cure International, 2011). This support will be discussed further in details and how it impacted on service provision.

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4.2.3.2.1. Parents/caregivers' communication with the service providers

In this study, most parents/caregivers indicated that the service providers did mention about clubfoot and its treatment at birth. They explained that a majority of the service providers (Nurses) would just mention that the child had a problem with the feet and would require treatment but did not give the details of the problem. However, majority of the parents/caregivers explained that the condition was covered exhaustively at the time of treatment at the three facilities. This was confirmed by responses such as:

"They told me everything about the management, they told me that I will be coming every week, they will be putting the plaster, and after the plaster they will put the braces and now he has the shoes"(CG1).

"What we do is we take time with them, explain all about clubfoot and make them understand that this is a condition that can be managed and corrected fully" (SP2)

It was remarkable to find that most parents/caregivers got sufficient information from the clinicians. Several parents/caregivers further explained that there was good communication through out the treatment period. They added that most of the service providers would educate them at every stage of treatment on the importance of compliance.

Good interactions are said to be paramount for common understanding and are strongly connected with adherence to treatment (Irochu-Omare, 2004). Good relationships between the service providers and patients/caregivers in the current study motivated patients/caregivers to actively participate in the management process. In addition, good relationships resulted in commitment and compliance to the treatment process (Gail et al., 2006; Van Wieringen, Harmsen & Bruijnzeels, 2002).

According to Irochu-Omare (2004) and King, Tamzin, King and Rosenbaum (2001), when management process is told to patients or parents/caregivers, they become well-informed and are optimistic about their treatment, feel more contented with care, and are likely to comply with the treatment requirements. On the other hand, patients who gets insufficient interactions with their health care providers and those who receives inadequate information or does not understand their health care providers' recommendations are likely to result to none compliance with the treatment (Malta et al., 2006)

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Service providers at Mbagathi and Kenyatta hospital had set aside one day for management of clubfoot. During this day, they were dedicated to attend to the clients holistically and comprehensively. Similarly, Kijabe is a hospital meant for purely clubfoot management. Therefore, health care providers at these facilities had time to take the parents/caregivers through education, counselling and the treatment process exhaustively. The service providers had sufficient time to attend to the problems of each parent/caregiver. They had time to provide treatment and discuss treatment related issues with the parents/caregivers as suggested by the authors. This gave ample opportunity for parents/caregivers to inform service providers of their concerns about the management. Additionally, this polite communication between the service providers and the parents/caregivers was planned in such a way that parents/caregivers meet the same service providers each time they attend the clinic. Therefore, the service providers knew the information previously given and were able to pick what was missing and what was needed. Further, educating the parents/caregivers about clubfoot treatment was part of the treatment practice at the three facilities.

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This cordial relationship with the service providers facilitated realistic goals to both the service providers and the parents/caregivers which improved compliance.

4.2.3.2.2. Availability of family/social support

Minority of the participants mentioned about family support. They stated family support as the important connection they had with their families and friends as a network of support that helped them during these time. Parents/caregivers reported three aspect of family support; these included the physical support they received at home, financial assistance that was necessary for the parents/caregivers and the child to attend treatment at the talipes clinics and emotional support that cheered the parents/caregivers to continue with treatment besides being stigmatized

by the community. Below is a detailed discussion of the family/social support received by parents/caregivers in relation to literature.

(i) Family physical and financial support for parents/caregivers

Few (n=3) parents/caregivers reported having somebody to assist with home chores while they were bringing the affected child for treatment at the clinics or taking care of the child at home. Parents/caregivers explained that the support was of great assistance since they got enough time to take care of the plaster cast as well as monitoring the child especially during bracing. This was highlighted by responses such as:

"*I got support from the family*" *(CG1).*

"Some of them get assistance from the family member" (SP4).

A section of the parents/caregivers indicated that they received financial assistance from their spouses which catered for transport to bring the children to the clinics. One parent/caregiver explained that her financial requirement was met by her mother since she was a student. Another participant indicated that she received financial support from the child's paternal grandparents. This form of family support was appreciated by the participants as essential in facilitating access to health facility. Support impact positively on the ability of the parents/caregivers to adhere and complete the treatment regime.

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(ii) Emotional support

The treatment period was such a long period that if parents/caregivers were not encouraged, would have given up. Minority of the participants reported to have received emotional support from the family members. This was confirmed by responses such as:

"*My mum was always behind me"(CG1).*

"*Put our counselling into some sort of Christian context to ensure psychological support" (SP1).*

The findings of this study indicated that the family/social support that few of parents/caregivers received facilitated compliance to the treatment regime. This concurred with the WHO's concept that assumes the family/community is a readily available source of support. A similar study by Moran and DuBois (2002) and Goodman (2001), found that the connection within the family system was perceived cohesive, flexible and supportive and had a positive effect on parents/caregivers in coping with clubfoot. However, this finding contradicted the study by Bischoff, Thornburn and Reitmaier (1996). The authors found a low degree of support of parents/caregivers of disabled children from neighbours in a Jamaican village.

The support offered to parents/caregivers in this study could be argued as incorporating the family members as stakeholders in management of the child and therefore the treatment of the child become a family/social responsibility as expressed by the parents/caregivers which is in agreement with Moran and DuBois (2002) and Goodman (2001). It could also be argued that the family member in this context were knowlegable on clubfoot, if not, they appreciated that the parents/caregivers of the children with clubfoot were people with emotional need, physical need, spiritual need and many other needs and they respected these needs. Some of them would possibly have realised the importance of providing a "shoulder to lean on" for the parents/caregivers when they felt helpless. Similarly, the service providers are saying that some of the parents/caregivers received all forms of support from their spouses and other family members as suggested by Staheli (2009). This support relieved the parents/caregivers the burden of family responsibility as well as taking care of other children and improved compliance with the treatment regime.

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4.2.3.2.3. Financial support for service providers

Service providers at Kijabe hospital reported receiving financial support from a Canadian organization. This support assisted in buying materials such as plaster of Paris, soft bands, abduction braces and free surgery for complex clubfoot. These materials were later distributed to CCK satellite clinics to facilitated free services. This was accentuated by the following reactions:

> **"***At the moment we are depending on the donor funding to provide plasters, soft bands and the monitoring machinery, but we are in close contact with the government***"** *(SP1).*

> *"Here we do not pay anything" (CG2)*

The National coordinators elaborated that this facilitation also supported in monitoring an evaluation of service provision of CCK clinics across the country. Likewise, he added that the government had been of great assistance in providing human resource. He explained that all the CCK clinics were in government facilities and were utilizing the government health care providers to deliver services. He said:

> *"The government provides a lot as I said earlier in terms of the staffs, the facilities and a lot of the infrastructure that helped us reach where we have reached at the moment"(SP1).*

> *"In most of the district hospitals, treatment of clubfoot is free" (CG3)*

However, they reported that they had not been able to support all the clubfoot clinics in the government facilities much as they were still trying to ensure that all the talipes clinics would be catered for by CCK.

(i) Outreach clinics

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Service providers at Mbagathi hospital explained that the facility was one of the CCK satellite clinics and therefore offered free services at the talipes clinic. The service providers reported that the support from CCK also included allocation for outreach services. They said that they were able to go to the community in the informal settlement and cater for the clients who could not make it to the clinic for one reason or the other. This was evident in the following speech marks:

> **"***Where the parents can't afford to come to the facility we have officers who are operating in the community. They do the assessment at the community level and apply the cast or the braces there" (SP6).*

> **"***Some times they see the children in our homes, especially when we fail to come for a long time" (CG7).*

Most of the parents/caregivers appreciated these services at the community level in consideration to the fact that clubfoot management takes a long time. They stressed on the importance of the free and available services particularly during casting where the parents/caregivers are attended to weekly.

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(ii) Free foot abduction braces

Parents/caregivers expressed their gratitude for the availability of free foot abduction braces. They reported that in some of the facilities where the foot abduction braces were bought, the prices were exorbitant, and not many parents/caregivers would afford. Informants explained that during bracing, they had to change the sizes severally. Therefore, it would require a lot of money to buy the braces up until the time when the child was four to five years of age. On the contrary, service providers at Kenyatta hospital reported a situation where services were paid for at the talipes clinic. However, service providers explained that they had some alternative source

of support for these parents/caregivers. They approached some organizations which were able to cater for the braces. These were expressed by responses such as:

> **"***I refer them there and they are assisted like these shoes, the abduction brace, AFO, and whatever, they are very expensive in these other places. In APDK patients get them for free" (SP3).*

> *"At APDK, children are given wheelchairs, braces, calipers and all the walking aids for free" (CG5).*

The service providers explained that payment of the services had a precarious effect on management of clubfoot. Most of the parents/caregivers who could not afford treatment would eventually drop out resulting in inadequately managed clubfoot.

According to Cure International (2011), financial support facilitates the provision of free clubfoot treatment services to populations of poor settings at the community level. This is further supported by Coackley and Dunning (2002) in sport participation. The authors found that financial support is essential in developing sports participation. They further added that financial support impacts positively on the ability of the patients to pay for transport as well as supply of sports facility

In the current study, the service providers are reporting availability of free services for the clients, provision of outreach services in the informal settlement and availability of free abduction braces which facilitates the adherence to treatment regime. In addition, the parents/caregivers are reporting receiving services at the community and getting ambulatory aids which has ensured compliance with the treatment regime. Therefore, financial support is important in enhancing treatment and compliance to the treatment regime.

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CHAPTER FIVE

SUMMARY, CONCLUSION, RECOMMENDATION, STRENGHT AND LIMITATIONS OF THE STUDY

5.0. INTRODUCTION

This fifth chapter provides the summary, conclusion and recommendation of the study. The important findings of this study are outlined in this chapter. Further, the recommendations are provided centred on the findings of this study. Finally, the strength and limitations encountered during this study are drawn.

5.1 SUMMARY

The purpose of the current study was to explore perceptions regarding medical management of clubfoot in three hospitals in Kenya. In order to achieve the aim, the study had to (i) explore the service providers perceptions of the use of different methods of medical management of clubfoot; (ii) explore the processes followed before actual management commences and after management from the service providers when using the surgical and Ponseti methods of management; (iii) explore the barriers and facilitators that the service providers experience during management of clubfoot; (iv) explore the experiences of parents/caregivers regarding medical management of clubfoot.

The study looked at the literature on the prevalence, causes, pathology and anatomy of clubfoot, management process and barriers encountered during management.

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Health experts and researchers have highlighted that clubfoot is becoming a serious global public health problem which is associated with physical disability in children. According to Ponseti, there has been strong scientific evidence that neglected, complex and inadequately managed clubfoot is a major cause of physical disability in children. Consequently Ponseti management has been associated with positive outcome, reduced risk of physical disability and improved quality of life. Researchers have stressed on the use of Ponseti method, early intervention and adherence to the treatment regime for effective management. Researchers clearly state that early intervention will reduce health care costs, prevent disabilities and improve quality of life. Community education and outreach services are some of the effective intervention that can promote early intervention in clubfoot management. However, little had been done about these strategies.

A qualitative research method was chosen for the study. The study population were parents/caregivers of children with clubfoot at the three facilities and service providers managing clubfoot at the time of data collection at the three facilities. The study sample included 10 parents/caregivers of children with clubfoot and 10 service providers. The participants were taken on from the talipes clinics of Mbagathi District Hospital, Kenyatta National Hospital and Kijabe Mission Hospital in Kenya. Semi-structured interviews were used for gathering information. The study employed thematic content analysis to analyse the data. At the time when the current study took place, most service providers perceived Ponseti to be the most effective method of clubfoot management. However, they acknowledged that Ponseti method was only effective when treatment is started early. Participants recommended surgical intervention when a child with clubfoot presents for the first time after two years. Nevertheless, surgical intervention was found not to have the best result. Ponseti method was said to involve serial casting,

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tenotomy and bracing while surgical method entailed admission, surgery and post-operative follow-up. The commonly identified difficulties service providers encountered during service provision to children with clubfoot included: missed diagnosis at birth; poor referral system; untrained staff in clubfoot management; poor compliance with the treatment regime by the parents/caregivers and lack of interest in clubfoot management by service providers. Common challenges parents/caregivers faced in attending treatment sessions included: lack of finances to facilitate transportation; lengthy travelling distance; lack of knowledge on clubfoot and treatment; stigma; culture and traditional beliefs.

5.2. CONCLUSION

The aim of this study was to explore the perceptions regarding medical management of clubfoot in Kenya. This aim was achieved. The finding indicated that the parents/caregivers and the service providers felt that the medical management of clubfoot was a success and brought positive effect in the lives of children with clubfoot. They felt that Ponseti was the most effective method of management while surgery was perceived to be applicable to neglected, complex or inadequately managed clubfoot. The positive effects of the Ponseti and surgical method have been highlighted. However, the majority of parents/caregivers agreed that the community did not have enough knowledge on clubfoot and its treatment. They were positive about the phases of treatment and the education from the service providers in relation to clubfoot. The study identified some difficulties servicer providers and parents/caregivers experienced during the treatment period. These challenges were also highlighted.

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5.3. STRENGTH OF THE STUDY

The participants volunteered to tell of their experiences and their challenges they experienced at the time of treatment. Therefore, they did not strain recalling what they essentially lacked. Generally, the study validated the significance of a qualitative approach to research that concentrates on obtaining the individuals' perceptions regarding clubfoot management. On top of endorsing the results of the biopsychosocial model, the results of the current study recommend the need to concentrate on clubfoot as a condition, the environment in which the parents/caregivers are living in and how it affects management and the adherence to treatment regime and finally, the acceptance of the parents/caregivers of the condition and the determination to seek treatment. Furthermore, the findings lay down areas that require to be looked into in clubfoot management that would improve the outcome of management.

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5.4. LIMITATIONS OF THE STUDY

1. Data was collected from the service providers who were available during the period of data collection. There were not many service providers who had managed clubfoot using the traditional method. Service providers who had managed clubfoot previously especially before the inception of Ponseti method may have had different experiences from the methods used at the time of the data collection. The second source of data was from parents/caregivers that attended the clinic for treatment. There were no interviews done with parents/caregiver who had defaulted. Parents/caregivers who did not attend may have faced more challenges than those who were attending the clinics hence further studies should try to do a follow-up on parents/caregivers who default.

2. The findings of the current study are based on a purposive and convenience sample of service providers at the two urban and one rural setting talipes clinics and parents/caregivers who attended the clinics. Thus, they may not be characteristic of other service providers in other settings and parents/caregivers who have children with clubfoot undergoing similar treatment in other settings. The study results therefore may not be generalised except to similar settings. However, in spite of these limitations, the researcher believes that the current study sheds light on perceptions regarding management of clubfoot and some of the factors that affect service delivery by the service providers. Additionally the study sheds light on the factors that affects compliance by parents/caregivers during the utilisation of services. Therefore, service providers can understand the nature and severity of these influences and how they affect compliance or adherence to treatment so that they can be abated.

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5.5. RECOMMENDATIONS

The recommendations are based on the current study findings. The implication of the study will be valuable in improving clubfoot management at the talipes clinics of the three facilities. The findings of the current study present a challenge to the service providers some of whom may be holding on to clubfoot management of the professional curriculum design for undergraduate students. The results explain the issues that need to be addressed in clubfoot management to match the expectations of the parents/caregiver. In addition, the results will be vital in formulating better management meant to harmonize management, referral and promoting utilization of health care services and adherence to the treatment regime at the clinics. These results can be utilized by the hospitals management to find gaps in health care delivery so that interventions are sought. For instance, harmonizing clubfoot management by having structures in

place to support the approved method is possible. In view of the results of this study, and the challenges the service providers experience while discharging services as well as challenges experienced by parents/caregivers in attending to treatment appointments clinics of Mbagathi District Hospital, Kenyatta National Hospital and Kijabe Mission Hospital, the following recommendations are made:

1. **Educational**

Health education program for the community on clubfoot and its management are essential. This will increase awareness among parents/caregivers of children on clubfoot. Education can disseminated through print-out using the local languages/vernacular. On the other hand, health talks can be given for pre-natal mothers during pre-natal care. These talks can be conducted by clinical officers, nurses, rehabilitation officers or medical educator which can be a good approach of disseminating information to parents/caregivers.

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Although the health care providers working in most of the public facilities may know the importance of early intervention in clubfoot management, they may be lacking in skills to offer the appropriate treatment. Therefore, there is great need for all rehabilitation officers and clinicians to undergo special training in clubfoot management. Trainings can be prepared in the form of seminars or workshops that can be held frequently.

Similarly there is need to train another level health care provider such as community health worker that will be based at the community level for early identification and prompt referral of children with clubfoot for clubfoot management.

Follow-up program

Clinicians should have the same patients they attend to every visit; this will ensure good follow up throughout the treatment session. It will provide an opportunity for a one-on-one relation

between the service providers and parent/caregiver for a longer period of time and will provide an opportunity for the service provider to help the family of the affected child to cope with the long time management period.

Clinicians should also have a follow up program for parents/caregivers that are not compliant to the treatment regime. This will facilitate monitoring and evaluation of the progress made by the children that have received Ponseti management

2. **Policy**

The Schools of Physiotherapy, Clinical medicine, the University of Nairobi Medical School and Moi University need to put emphasis on teaching clubfoot management. With this knowledge, health care providers from these schools can effectively meet patients and parents/caregivers' expectations regarding clubfoot management.

3. **Community based rehabilitation**

It is important to decentralize services from the referral hospitals to the dispensaries that are within reach to most parents/caregivers. This can be realized through mobile clinics and outreach clinics in areas that are situated far from the referral hospitals. This would reduce distance and improve the availability of these services to the financially unstable families that cannot afford transport.

4. **Further research**

More studies that would utilize qualitative, quantitative and the mixture should be conducted on the same topic in other facilities and other parts of the country to explore and assess the perceptions on medical management of clubfoot. This would get data on perceptions of service providers as well as parents/caregivers in various settings. This could be utilized to make programs that could improve the treatment of clubfoot in Kenya. Furthermore, a related study

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with a bigger study sample from all referral hospitals in Kenya should be done for comparison. This is due to the fact that the results of the current study cannot be generalised. The study was conducted in two urban referral hospitals and one rural mission hospital. Results from related work would factor in data on the treatment needs of parents/caregivers and barriers that affects management.

5. **Increase in human resource**

It is necessary to increase the number of health care givers in health facilities especially those involved in clubfoot management. This will facilitate provision of outreach services to the community which enable parents/caregivers of children with clubfoot to access rehabilitation services for their children.

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APPENDIX A

CONSENT FORM

Title of Research Project: PERCEPTIONS REGARDING MEDICAL MANAGEMENT OF CLUBFOOT IN KENYA

The study has been described to me in language that I understand and I freely and voluntarily agree to participate. My questions about the study have been answered. I understand that my identity will not be disclosed and that I may withdraw from the study without giving a reason at any time and this will not negatively affect me in any way.

Participant's name……..

Participant's signature……..

Witness……

Date……

UNIVERSITY of the WESTERN CAPE

Should you have any questions regarding this study or wish to report any problems you have experienced related to the study, please contact the study coordinator:

Study Coordinator's Name: Naomi Wanjiru Kingau

University of the Western Cape

Private Bag X17, Belville 7535

Telephone: (021)959-

Cell: +27725002671

Fax: (021)959-

Email: nkwanjiru@yahoo.com

APPEDIX B

INFORMATION SHEET

Project Title: Perceptions of service providers regarding medical management of clubfoot

This is a research project being conducted by Naomi Wanjiru Kingau at the University of the Western Cape. We are inviting you to participate in this research project because you are involved in management of clubfoot. The **aim** of this study is to explore the perceptions of the service providers regarding the medical management of clubfoot. This information is needed to improve the management of clubfoot at the facility and the country at large

You will be asked to take part in a one on one interview with the researcher when you accept to participate and give a written consent. An appointment will be made and the interview scheduled at a time and place that is convenient for you and the researcher at the hospital .The researcher will use a research assistant to take notes and a tape recorder for recording the interviews. Each interview will take approximately 60-75 minutes. The researcher will use some written question to guide you through the interview but other avenues can always be explored. These are some of the question that will guide the researcher through the process

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Q1. I am aware that you see different client that are presenting with clubfoot in this clinic, please tell how many clients per week do you see?

Q2. Having this clinic that manages clubfoot in this district, what is your reaction when you see them?

Q3. When you get these clients, what do you do with them?

- Assessment
- Diagnosis
- Management plan

Q4. When you are managing this condition which methods are you using?

We will do our best to keep your personal information confidential. To help protect your confidentiality you will not be named during the process of the interview to ensure anonymity. After the interview, data will be kept in a safe place having locked filing cabinets and storage areas, using identification codes only on data forms, and using password-protected computer files**.** If we write a report or article about this research project, your identity will be protected to the maximum extent possible.

There are no known risks associated with participating in this research project. This research is not designed to help you personally, but the results of this study may be used to improve the management of clubfoot at a Talipes clinic of the hospital. The result may also be used by clubfoot care international to improve services at this hospital. Lastly the result may be valuable at policy and implementation level to ensure that the management of clubfoot is incorporated in all medical schools curriculum and other health training institutions. We hope that, in the future, other people might benefit from this study through improved medical management of clubfoot

Your participation in this research is completely voluntary. You may choose not to take part at all. If you decide to participate in this research, you may stop participating at any time. If you decide not to participate in this study or if you stop participating at any time, you will not be penalized or lose any benefits to which you otherwise qualify.

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This research is being conducted by Naomi Wanjiru Kingau of the department of physiotherapy at the University of the Western Cape. If you have any questions about the research study it self, please contact Naomi Wanjiru Kinga +27725002671 e-mail nkwanjiru@yahoo.com

Should you have any questions regarding this study and your rights as a research participant or if you wish to report any problems you have experienced related to the study, please contact:

Head of Department:

Dean of the Faculty of Community and Health Sciences:

University of the Western Cape

Private Bag X17

Bellville 7535

This research has been approved by the University of the Western Cape's Senate Research Committee and Ethics Committee.

UNIVERSITY OF THE WESTERN CAPE

INFORMATION SHEET TEMPLATE

ADDITIONAL GUIDANCE FOR SPECIFIC ISSUES

Audio taping

This research project involves making audiotapes of you. This is because the research assistant may not be able to write every thing during the interview. After the interview, data will be kept in a safe place having locked filing cabinets and storage areas, using identification codes only on data forms, and using password-protected computer files**.**

___ I agree to be audiotaped during my participation in this study.

___ I do not agree to be audiotaped during my participation in this study.

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WESTERN CAPE

APPENDIX C

INTERVIEW GUIDE FOR SERVICE PROVIDERS

Q1. I am aware that you see different client that are presenting with clubfoot in this clinic, please tell how many clients per week do you see?

Q2. Having this clinic that manages clubfoot in this district, what is your reaction when you see them with neglected or inadequately managed clubfoot?

Q3. At which stage of your management do you see these clients? What does your management of these clients entail?

- Assessment
- Diagnosis
- Management plan

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WESTERN CAPE

Q4. When you are managing this condition which methods are you using?

- Why

Q5. How do you go about selecting the method of management?

Q6. Do you know of other methods of management of clubfoot?

Q7. Tell me about your experiences when using the selected procedure

Q8. Among the methods you are using in this institution, which one do you think is effective for management of clubfoot?

- Why?

Q7. Do you think that these methods are successful?

Q8. Are you satisfied with the outcome of these procedures?

- Why

Q9. Tell me about the challenges of using these methods.

- How do you manage these challenges?

Q10. Let's talk about the positive thing of using these methods.

Q11. What is the future of clubfoot management in this institution?

Is there any other information regarding clubfoot management in your institution you would like to share with me?

I am very grateful for your time and most importantly your information, perception and experiences that you have shared with me. This information will be of immense support in improving medical management of clubfoot at the institution and may be in the country at large.

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APPENDIX D

INTERVIEW GUIDE FOR PARENTS/CAREFIVERS

Q1. Tell me, when you knew that your child had clubfoot.

Q2. Let as discuss on how you learned that the child had clubfoot.

Q3. Tell me how you went about treatment when you realized that the child had clubfoot

Q4. How was your child managed?

Q5. When the service providers were treating your child, how did they go about it? (From the first time you went to the hospital up until today)

Q6. Do you think the method used in this facility is effective?

Q7. What is your feeling about facilities where clubfoot is managed differently?

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Q8. Now, having this clinic that manages clubfoot in this district, what do you think the problem is, when you see children with neglected or inadequately managed clubfoot?

Q9. Tell me about your experiences with clubfoot management.

Q10. Share with me the challenges that you have faced during clubfoot management.

Q11. What do you think should be done to alleviate these problems?

Is there any other information regarding clubfoot management you would like to share with me?

I am very grateful for your time and most importantly for your information, perception and experiences that you have shared with me. This information will be of immense support in improving medical management of clubfoot at the institution and may be in the country at large

APPENDIX E

UNIVERSITY of the
WESTERN CAPE

OFFICE OF THE DEAN
DEPARTMENT OF RESEARCH DEVELOPMENT

PROFESSOR RENFREW CHRISTIE
DEAN OF RESEARCH
14 NOV 2011
UNIVERSITY OF THE WESTERN CAPE

20 September 2011

To Whom It May Concern

I hereby certify that the Senate Research Committee of the University of the Western Cape has approved the methodology and ethics of the following research project by:
Mrs NW Kingau (Physiotherapy)

Research Project: Perceptions of service providers regarding medical management of clubfoot.

Registration no: 11/8/15

Ms Patricia Josias
Research Ethics Committee Officer
University of the Western Cape

UNIVERSITY of the
WESTERN CAPE

Private Bag X17, Bellville 7535, South Africa
Tel: +27 21 959-2948/9
Fax: +27 21 959 3170

APPENDIX F

AIC KIJABE HOSPITAL

"Health Care to God's Glory"

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Telegram:MEDSUP AIC kijabe
Fax: 254-203246-355

P.O. Box: 20-00220
Kijabe -Kenya
www.aickijabe.go.ke
Date:
22nd December, 2011

Our Ref: KJB/ADM/12/1/MED-011/201/15

Naomi WanjiruKingau
of the Western Cape
Bellville 7535

University
Private Bag, X17,
SOUTH AFRICA

RE: RESEARCH AUTHORISATION

Following your application for authorization to carry out research on **"Perceptions Regarding Medical Management of Clubfoot"** I am please to inform you that you have been authorized to undertake research in **Kijabe Mission Hospital** for a period ending 28th February 2012

You are advised to report to the officer in-charge of the **Rehabilitation Department** before commencing on the research project.

On completion of the research, you are expected to submit a hard copy and a soft copy of the research report/thesis to our office.

DR. THEURI

MEDSUP, AIC KIJABE MISSION HOSPITAL

C.C. The officer in-charge of Rehabilitation Department

The officer in-charge of CCK clinic

UNIVERSITY of the WESTERN CAPE

APPENDIX G

UNIVERSITY OF NAIROBI
COLLEGE OF HEALTH SCIENCES
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(254-020) 2726300 Ext 44355 www.uonbi.ac.ke

KENYATTA NATIONAL HOSPITAL
P O BOX 20723 Code 00202
Telegrams: MEDSUP Nairobi

Ref: No. KNH ERC/R&R/48Link: www.uonbi.ac.ke/activities/KNHUoN

1[ST] December 2011

Naomi WanjiruKingau
University of the Western Cape
Private Bag, X17,
Bellville 7535
SOUTH AFRICA

RE: RESEARCH AUTHORISATION

Following your application for authorization to carry to carry our research on **"Perceptions Regarding Medical Management of Clubfoot"** I am please to inform you that you have been authorized to undertake research in **Nairobi and Central Province** for a period ending **28[th] February 2012.**

UNIVERSITY of the
WESTERN CAPE

You are advised to report to report to the **Provincial Commissioner, the Provincial Director of Medical Services, Nairobi and Central Province** before embarking on the research project.

On completion of the research, you are expected to submit on had copy and one soft copy of the research report/thesis to our office and all the three facilities.

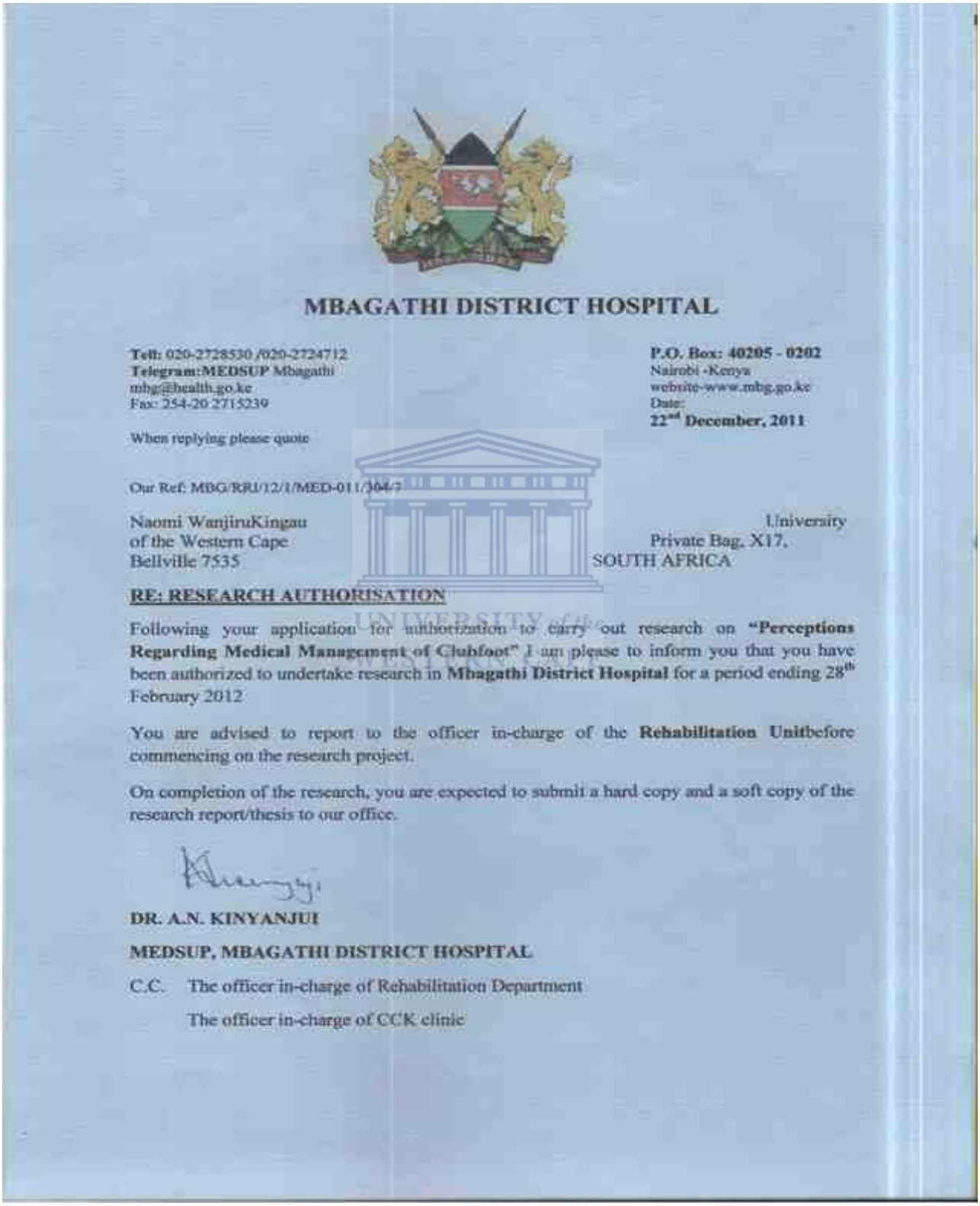
[illegible signature]

PROF. A.N. GUANTAI

SECRETARY, KNH/UON-ERC

C.C. The Deputy Director CS, KNH
The Principle, College of Health Science, UON
Selected Hospitals

APPENDIX H



MBAGATHI DISTRICT HOSPITAL

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Nairobi -Kenya
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Date:
22nd December, 2011

When replying please quote

Our Ref: MBG/RRI/12/1/MED-011/304/3

Naomi WanjiruKingau
of the Western Cape
Bellville 7535

University
Private Bag, X17,
SOUTH AFRICA

RE: RESEARCH AUTHORISATION

Following your application for authorization to carry out research on **"Perceptions Regarding Medical Management of Clubfoot"** I am please to inform you that you have been authorized to undertake research in **Mbagathi District Hospital** for a period ending 28th February 2012

You are advised to report to the officer in-charge of the **Rehabilitation Unit**before commencing on the research project.

On completion of the research, you are expected to submit a hard copy and a soft copy of the research report/thesis to our office.

DR. A.N. KINYANJUI

MEDSUP, MBAGATHI DISTRICT HOSPITAL

C.C. The officer in-charge of Rehabilitation Department

The officer in-charge of CCK clinic