UNIVERSITY OF HEALTH AND ALLIED SCIENCES

SCHOOL OF ALLIED HEALTH SCIENCES

DEPARTMENT OF PHYSIOTHERAPY AND REHABILITATION SCIENCES

PREVALENCE AND MANAGEMENT OUTCOME OF CLUBFOOT IN GHANA: A 5-YEAR RETROSPECTIVE STUDY OF TWO TERTIARY HOSPITALS

A PROJECT DISSERTATION SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A DEGREE OF BACHELOR OF PHYSIOTHERAPY

IN THE

DEPARTMENT OF PHYSIOTHERAPY AND REHABILITATION SCIENCES

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JULY, 2022

DECLARATION

With the exception of references and quotations from other sources which have all been credited, we the undersigned, hereby declare that this piece of work is the original research work of mine and that no part of it has been presented elsewhere. Also, we would like to say that any errors of judgment, facts, omissions and style remain our liability.

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DEDICATION

This work is dedicated to God almighty and our lovely parents.

ACKNOWLEDGEMENT

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LIST OF ACRONYMS AND ABBREVIATIONS

WHO: World Health Organization

CTEV: Congenital Talipes Equinovarus

HFCS: Hind Foot Contracture Score

MFCS: Mid Foot contracture Score

PC: Posterior Crease

EH: Emptiness of Heel

RE: Rigidity of Eqinus

MC: Medial Crease

CLB: Curvature of the Lateral Boarder LHT: Lateral Head of Talus

LMIC: Lower- and Middle-Income Countries

ABSTRACT

Background: Congenital talipes equinovarus more commonly known as clubfoot is a leading cause of disability among children worldwide. Clubfoot describes a range of foot abnormalities usually present at birth (congenital) in which the foot of a newborn is twisted out of shape or position. The most common causes of clubfoot are unknown. The incidence of clubfoot is approximately 1 in 1000 live births per year, with the global burden of this birth defect affecting more than 150,000 infants each year. Ponseti method has become the gold standard for the treatment of congenital clubfoot. Much research has been conducted on its prevalence and treatment outcomes around the globe and in some parts of Ghana but there is no known research done in the Cape Coast Teaching Hospital and Effia Nkwanta Hospital in Takoradi. **General Aim:** This study aims to investigate the prevalence and treatment outcome of clubfoot among patients who attended the physiotherapy department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospitals from January 2016 to December 2020. **Methodology:** A five-year retrospective study design from January 2016 to December 2020 was used. The study population comprised of patients with clubfoot who underwent rehabilitation at the Physiotherapy unit at the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital. Information was retrieved monthly and yearly (foot/feet involved, the gender of participants, clubfoot causes and management outcomes) from folders of first-time patients with a clubfoot who attended the Physiotherapy Department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital within the research period. **Sampling Method:** Medical records and information on all first-time clients who presented to the Physiotherapy department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospitals within the research period was retrieved from the data storage system. Clubfoot deformities from those records was extracted and reviewed which was based on first time visit criteria. **Results**: The study saw a relatively higher prevalence of club foot in CCTH (76.8%) than ENRH (54.3%) The average prevalence of the disease from 2016 to 2020 in CTH and ENRH were 15.36% and 10.86% out of a total of 192 and 83 cases respectively. Maternal age is positively correlated with the number of feet involved in the disease (P-value = 0.046). Age is not correlated with any of the disease characteristics in the Effia Nkwanta Regional Hospital, but correlated with management outcome in both Hospitals. The relationship between mother occupation and disease classification has little statistical significance. **Conclusion:** The study saw relatively high prevalence of clubfoot in the cape coast Teaching Hospital which is attributable to the fact that Cape Coast Teaching Hospital serves more of referral Hospital for Central Region than the Effia Nkwanta Governmental Hospital which is a regional hospital. With demographic and disease characteristics, age is positively correlated with the number of feet involved in the disease and management outcome in Cape Coast Teaching Hospital while it is not correlated with any of the disease characteristics in the Effia Nkwanta Regional Hospital. Pirani's assessment scores revealed a higher correction rate in Cape coast Teaching.

1.1 Background of Study

Clubfoot is one of the most common congenital musculoskeletal birth defects. If left untreated, it leads to physical impairment and deformity, resulting in loss of mobility and function. (Vundule, Maforah & Jewkes, 2018). The cause in most cases is unknown. With early diagnosis and appropriate treatment, functional impairment from clubfoot is avoidable (Vundule et al. 2018). The incidence of clubfoot is approximately 1 in 1000 live births per year, with the global burden of this birth defect affecting more than 150,000 infants each year (Evans & Van Thanh, 2009). Over 80% of clubfoot cases occur in developing nations, where clubfoot is a major disease burden in low resource areas (Morcuende, 2006). Despite many previous research studies and investigations, the etiology and pathogenesis of clubfoot have not been fully elucidated. The prevalence of clubfoot is reported to be between 0.39 and 6 cases in every 1000 live births in Peru; this wide difference is mainly due to ethnic factors. It is more prevalent in males (M/F=2.5/1) (Ardebili, Yeganeh, Imanzadeh, Bigdeli & Okhovatpour, 2011).Clubfoot is about 30 times more common in the first-degree relatives of the patients with clubfoot. In 24.4% of the patients with clubfoot, there is a positive family history (Ardebili et al, 2011). A study conducted by Vundule et al. (2018) reported that the birth prevalence of clubfoot varies in both low and middle-income countries (LMICs). According to a study conducted at Queen Elizabeth Central Hospital, Banter, Malawi by Mkandawire and Kaunda (2004), the incidence of clubfeet among children born at the hospital is estimated at 2 per 1000 live births. Studies among black South Africans showed that the incidence of congenital clubfoot is between 1.5 per 1000 and 3.5 per 1000 live births. Among Caucasian populations, the incidence of congenital clubfoot is between 0.64 and 2.5 per 1000 live births. Males are involved more frequently than females; bilateral involvement is more common than unilateral involvement and the right side is more commonly involved than the left side (Mkandawire et al, 2004). Children with clubfoot

associated with other congenital anomalies accounted for 22 (34%) of all cases (Mkandawire et al, 2004). Mkandawire et al, (2004) recommended that this hospital-based clubfoot incidence study over nearly two years should be continued and expanded to other hospitals and to the traditional birth attendant to establish the true incidence of clubfoot in Malawi.

In this research, the total number of clubfoot cases for both hospitals within the research period was 276. The average prevalence of the disease from 2016 to 2020 in CTH and ENRH were 13.6% and 12.4% respectively. Even though there is almost equal prevalence of clubfoot in the two Hospitals, Cape Coast Teaching Hospital (CCTH) recorded relatively higher prevalence of clubfoot than Effia Nkwanta Regional Hospital (ENRH). Maternal age is positively correlated with the number of feet involved in the disease (P-value = 0.046). Age is correlated with any of the disease characteristics in the Effia Nkwanta Regional Hospital, but correlated with management outcome in both Hospitals. The relationship between mother occupation and disease classification has little statistical significance

1.2 Problem Statement

Clubfoot is one of the most common congenital musculoskeletal birth defects. (Vundule, Maforah & Jewkes, 2018). Untreated clubfoot leads to physical impairment and deformity, resulting in loss of mobility and function. The cause in most cases is unknown. With early diagnosis and appropriate treatment, functional impairment from clubfoot is avoidable (Vundule et al, 2018). According to the Global initiative statistics, about 820 babies are born with clubfoot each year in Ghana. Bandoh, (2011) concluded in his research "outcome of treatment of clubfoot at the Korle Bu orthopedic unit using the Ponseti method" that most of the cases seen were not fully corrected increasing the default rate ranging 70 to 80%. Many Studies have been carried out on the incidence, prevalence and characteristics of clubfoot globally and in some part of Ghana such as in the Northern of Ghana by Banson et al, (2018) and Abebrese, (2016) in the Komfo Anokye Teaching Hospital, but there is no known studies

and publication (s) about the prevalence and management outcome of clubfoot in the Cape Coast Teaching Hospital (CCTH) and the Effia Nkwanta Regional Hospital (ENRH) in Ghana.

1.3 Justification/Relevance

According to research conducted by Bandoh, (2011), clubfoot is a very common birth defect among children in Ghana but little is known about the causes and management of this deformity among the general population. This study seeks to provide baseline information regarding the yearly prevalence, demographics and management outcomes of clubfoot among patient who attended the Physiotherapy Department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital in Ghana. Results from this study will add to the epidemiological data on Club foot in Ghana. It will as well help in the planning and allocation of resources by the hospital and the department to deal with clubfoot patients who visit the facility for care. This will lead to the efficiency and efficacy of the treating of this disability. Finally, since the two hospitals included in the study are tertiary facilities, data collected is valuable and to a large extent can be generalized to a bigger population.

1.4 Aim

This study aims to evaluate the prevalence and management outcome of clubfoot among patients who have attended the Physiotherapy Department of the Cape Coast Teaching Hospital and the Effia Nkwanta Regional Hospital in Ghana.

1.4.1 Specific Objectives of the Study

- To determine the prevalence of clubfoot among patients of the physiotherapy departments of the Cape Coast Teaching Hospital and the Effia-Nkwanta Regional Hospital.

- To ascertain the demographic and disease characteristics of the patients with clubfoot.
- To ascertain the management outcome of the patients who were managed with the Ponseti rehabilitation approach.

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1.4.2 Research Question

- What is the prevalence of clubfoot among patients at the Physiotherapy Department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital?

- What is the demographic and disease characteristics of the patients with clubfoot at the Physiotherapy Department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital?

- What is the Management outcome of clubfoot at the Physiotherapy Department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital?

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Clubfoot, also known as congenital talipes equinovarus (CTEV), is one of the most common structural and visible birth defects and is responsible for major disability in children. Clubfoot may affect either one foot or both feet and is most commonly idiopathic clubfoot.Much less commonly, it can also present as Syndromic clubfoot, which is associated with other congenital abnormalities. About half of the infants with clubfoot have bilateral involvements, and unilateral deformity occurs more often on the right side. (Sheik-Ali et al., 2020). Posteromedial ankle and foot soft tissue contractures deform and displace tarsal anlagen, giving rise to characteristic deformities of equinus, heel varus, midfoot adducts, and cavus. It has been found that Syndromic clubfoot is often more severe and more resistant to treatment. If clubfoot remains untreated, the abnormality can lead to long-term functional disability, deformity, and pain. (Ansar, Rahman, Romero, Haider, Rahman & Moinuddin, 2018.)

2.2 Pathoanatomy

A postural deformity needs to be distinguished from a true clubfoot. The cause of the postural deformity is the position in utero in contrast to the true clubfoot, which has an underlying pathology (Yazdy, Mitchell & Louik, 2014). Additionally, the postural condition usually responds to passive manipulation by the mother. Clubfoot is characterized by equinus, varus, adductus, and cavus. The equinus deformity of the clubfoot is present at the ankle joint, talocalcaneonavicular joint, and forefoot. In the varus component, the hindfoot is rotated inwards and this occurs primarily at the talocalcaneonavicular joint. The whole of the tarsus, except for the talus, is rotated inward concerning the lower leg. Since the forefoot follows the hindfoot, the medial border of the forefoot faces upward. The adductus deformity takes place

at the talonavicular and the anterior subtalar joints. The cavus component involves forefoot plantar flexion, which contributes to the composite equinus (Smoley, 2009).

2.3 Birth Prevalence

The global prevalence of clubfoot is estimated to be between 0.6 and 1.5 per 1000 live births with around 80% of all clubfoot cases being born in low and middle-income countries (LMICs). According to a 2014 estimate by the Global Clubfoot Initiative, the prevalence of clubfoot is 1.4 per 1000 live births in Sweden. In Australia, the prevalence is higher among the Aboriginal population than the Caucasian population, at 3.5 and 1.1 per 1000 live births respectively (Wallander, Hovelius & Michaelsson, 2006). The prevalence is 0.76 per 1000 live births in the Philippines and 0.9 per 1000 live births in India.

A study using the pooled data from 10 birth-defect surveillance programs in the USA showed the overall prevalence of clubfoot was 1.29 per 1000 live births; 1.38 among non-Hispanic whites, 1.30 among Hispanics, and 1.14 among non-Hispanic blacks or African-Americans.

Wynne-Davies reported the prevalence rate is much lower among Asians at about 0.6 per 1000 live births compared with Pacific Islanders at more than 6 per 1000 live births (Cooke, Balain, Kerin & Kiely, 2008). Another study in Uganda found a similar rate of 1.2 per 1000 with a male to female ratio of 2.4:1(Pirani et al., 2009).

A recent review conducted by Smythe et al. (2017), revealed that the pooled estimate for clubfoot birth prevalence in lower and middle-income countries within World Health Organization regions are as follows; 1.11 in Africa, 1.74 in America, 1.21 in South-East Asia, 1.19 in India, 2.03 in Turkey (Europe region), 1.19 in the Eastern Mediterranean region, 0.94 in the West Pacific and 0.51 in China.

2.4 Prevalence of Clubfoot Ghana.

Banson, Egyin & Buunaaim (2018) concluded in their study that 0.9 per 1000 live births prevalence of clubfoot in the Northern region of Ghana with twice as many males than females having the condition. Idiopathic clubfoot and bilateral manifestations were the most common disease presentations for the 2015 to 2016 period among 112 babies.

Boakye, Afiriyie & Abebrese (2016) in a five-year retrospective study to investigate the occurrences and seasonal distribution of idiopathic clubfoot at the Komfo Anokye Teaching Hospital recorded 271 cases and 420 cases of idiopathic clubfoot respectively in the same clubfoot clinic. According to the findings of the study, external climatic conditions may have very little or no influence on the occurrences and distribution of idiopathic clubfoot. Thus, the etiology may be skewed largely to inherent pathophysiologic and or genetic events during fetal development.

2.5 Etiologies

In approximately 80% of cases, clubfoot is idiopathic. The remaining 20% present in association with other disorders, most commonly Spinal Bifida, Cerebral Palsy, and Arthroscopic. (Bridgens & Kiely, 2010). The causes of clubfoot are poorly understood (Siapkara & Duncan, 2003). There is almost certainly a genetic component and environmental factors, seasonal variation and in utero positioning have all been suggested as possible causal factors but these have not been consistently demonstrated (Siapkara & Duncan, 2003). In some countries and cultures, there are different beliefs about what causes a child to be born with clubfoot. These include spiritual influences, spells, or curses often leading to mothers being blamed for the deformity. (Siapkara & Duncan, 2003)

These ideas can cause the child with clubfoot to be excluded from society,therefore, it is important to explain to families that children with clubfoot are a valuable part of the community (Smythe et al, 2018). Several theories have been proposed to explain the origin of clubfoot,

considering both intrinsic and extrinsic causes, including the intrauterine position of the fetus, mechanical compression or increased hydraulic pressure, interruption in fetal development, viral infections, vascular deficiencies, muscular alterations, neurological alterations, defect in the development of the bone's structures and genetic defects. (Maranhao & Volpon2011). Researchers believe there are both genetic and environmental influences.

The following theories as reported by Wallander et al in 2009 but are unproven and should not be considered as genuine causes:

i. **Neurogenic Theory:** Reduced motor unit, which counts in the distribution of the common peroneal nerve, may be responsible for clinically demonstrable muscle weakness (Wallander et al,2009).

ii. **Myogenic Theory:** Suggested by the presence of anomalous muscles,e.g. accessory soleus muscle and flexor digitorum accessorius longus muscles, which can produce equinovarus deformity.(Pandey & Pandey,2003). Vascular Theory: Diminution of blood flow in the anterior tibial artery and its derivatives (Wallander et al., 2009).

iii. **Embryonic Theory:** Developmental defect occurring up to 12 weeks of intrauterine life. (Pandey & Pandey,2003).

iv. **Chromosomal Theory:** Presence of some chromosomal defects in unfertilized germ cells (Wallander et al., 2009).

v. **Osteogenic Theory:** Due to some unknown cause, temporary arrest of development occurs in the 7- to 8- 8-week-old embryo, which can lead to clubfoot or other deformities. (Wallander et al., 2009).

vi. **Mechanical Block Theory:** Due to some mechanical obstruction during the intrauterine development period, e.g. intrauterine fibrotic bands, less amniotic fluid, disproportionate uterine cavity, etc., talipes equinovarus can occur (Pandey & Pandey, 2003).

2.6 Clinically Relevant Anatomy & Clinical Presentation

The foot consists of 26 bones. Most relevant for this congenital deformity are the Talus, Calcaneus, and Navicular. The underlying deformity of clubfoot can be most easily understood if it is divided into four components, whose first letters make up the word CAVE. These components are Cavus, Adductus, Varus, and Equinus. The Cavus and Adductus deformities occur in the midfoot, while the Varus and Equinus deformities occur in the hindfoot (Smythe et al., 2018). Cavus in the midfoot is the first part of the deformity of clubfoot. The arch of the foot is higher than normal because of the first metatarsal being plantarflexed about the Calcaneus and hindfoot (Smythe et al., 2018).

Fig.1
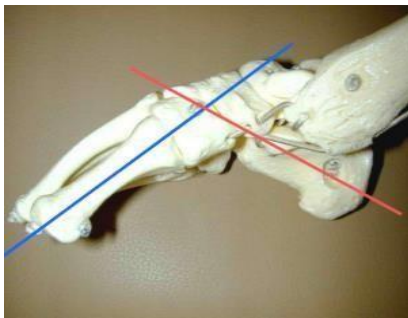
Clubfoot-cavus **(Smythe et al., 2018)**
Adductus is the movement towards the midline. Adductus is the second part of the clubfoot deformity. The forefoot is adducted towards the midline. This is the second part of the deformity of clubfoot. The navicular moves medially and starts to dislocate off the talus. The calcaneum also rotates medially under the talus as part of the adductus deformity (Smyth et al, 2018).

Fig.2
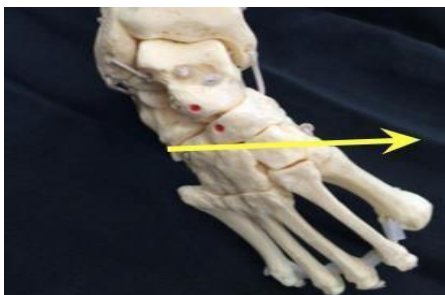
Clubfoot-adductus (Smythe et al, 2018)

Varus means movement towards the midline. The Varus of the hindfoot is the third part of the

deformity of the clubfoot. The heel is in varus with the tibia (Smythe et al, 2018).

Fig. 3

Clubfoot-varus (Smythe et al, 2018)

Equinus means an increase in the plantar flexion of the foot. The entire foot points downwards

in relation to the tibia. Equinus of the hindfoot is, therefore, the fourth part of the clubfoot

deformity (Smythe et al, 2018)

Fig. 4
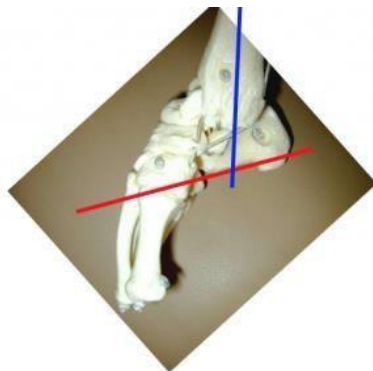
Clubfoot-equinus (Smythe et al, 2018)

The deformity consists of equinus/plantarflexion at the ankle combined with adduction and

inversion at the subtalar, midtarsal, and anterior tarsal joints (Adams & Hablen, 2001). Clubfoot

can be described as "congenital dislocation of the Talo-Calcaneal-Navicular (TCN) Joint''

(Anand & Sala 2008). The navicular moves medially on the talus while the calcaneus rotates

under the talus in the clubfoot. The foot is held in adduction and inversion by ligaments and

muscles. Muscles that are contracted are triceps surae, tibialis posterior, flexor digitorum longus, and flexor hallucis longus. Further, there is an imbalance between the inverter-plantar flexor muscles and the everter-dorsiflexor muscles. The calf and peroneal muscles are usually poorly developed (Adams & Hablen 2001). Weak peroneal muscles allow the foot to be inverted (Staheli, 2009).

2.6 Classification of Clubfoot

Not all Clubfeet are the same and it is important that all people treating clubfoot use the same terms to describe the different types. Each type of clubfoot has unique characteristics and may need specific treatment. Early recognition of the type of clubfoot one is dealing with can help guide appropriate treatment. Although there is no universal classification system for clubfoot, clubfoot can be classified according to the nature of the deformity (Minoo, 2019).

Positional Clubfoot: Positional clubfoot refers to a flexible foot that was held overtime in an abnormal position in utero. When the child is born, due to the prolonged positioning, they may present with one or both feet in an atypical resting position. Children with positional clubfoot typically exhibit an unrestricted passive range of motion of the forefoot and ankle. The foot at the time of birth has some deformity but bony alignment is not impacted and foot position is likely corrected through conservative treatment involving a program of stretching, range of motion, and weight bearing. In a small number of cases post conservative treatment the foot needs 1 or 2 Casts to ensure they are maintained in a corrected position although in the majority of cases these feet usually correct well and do not lead to any long-lasting, significant impairment (Smythe et al.,2018).

Idiopathic Clubfoot: Most commonly, clubfoot is classified as "Idiopathic Clubfoot" meaning there is no known cause for the deformity. In idiopathic clubfoot, there can also be a definite hereditary influence, in the sense that if a person has a relative, parent, or sibling has clubfoot, then they are more likely to have clubfoot or have a child with it (3-10% chance). Within the

group of idiopathic clubfeet, there is a wide spectrum of impairment depending on severity, as well as whether the clubfoot has been untreated, partially treated, poorly treated, or successfully treated. (Smythe et al., 2018). These are outlined by the Africa Clubfoot Training (Smythe et al.,2018) as follows:

Untreated Clubfoot - all clubfeet from birth up to 2 years of age that have had very little or no treatment can be considered as untreated clubfeet.

Treated Clubfoot - untreated clubfeet that have been corrected with Ponseti treatment are termed "treated clubfeet". Treated clubfeet are usually braced full-time for 3 months and at night up to age 4 or 5 years.

Recurrent Clubfoot - this is a clubfoot that has achieved a good result with Ponseti treatment, but the deformity has recurred. The commonest reason is due to abandoning the braces early.

Neglected Clubfoot - the neglected clubfoot is clubfoot in a child older than 2 years, where little or no treatment has been performed. The neglected clubfoot may respond to Ponseti treatment, but also may have a bony deformity that requires surgical correction.

Complex Clubfoot - any foot with a deformity that has received any type of treatment other than the Ponseti method may have added complexity because of additional pathology or scarring from surgery.

Resistant Clubfoot - this is a clubfoot where Ponseti treatment has been correctly performed but there has been no significant improvement. It is often found that this type of clubfoot is not, in fact, idiopathic after all and is secondary or syndromic.

"Atypical" Clubfoot -It involves a foot that is often swollen, has a plantarflexed first metatarsal, and an extended big toe. It can occur spontaneously but most often occurs after slippage of a cast.

Secondary Clubfoot: Secondary clubfoot, on the other hand, occurs when there is another disease or condition that is causing or linked to the development of clubfoot. Such conditions are usually Neurological such as Spinal Bifida associated with concurrent sensory and or motor impairments or Syndromic Disorders such as Arthrogryposis associated with more global findings and involvement of other musculoskeletal issues. (Smythe et al., 2018)

2.7 Outcome Measures for Clubfoot

The most commonly used outcome measure is the scoring system of Pirani. This scoring system assesses the severity of clubfoot deformity and response to treatment (Docker, Lewthwaite & Kiely, 2007). It has a predictive value concerning the number of casts needed to correct the foot. A high score, 4 or more, predicts the use of at least 4 casts. A score less than 4 predicts the need for 3 or fewer casts. Each component is scored as 0 (normal), 0.5 (mildly abnormal) or 1 (severely abnormal), it assesses the deformity with a total score of 6 (most severe) (Staheli, 2009).

2.8 Treatment

Many different treatment methodologies for clubfoot have been used but since the 1970's the Ponseti Method of treatment has grown in popularity and has completely replaced the previous methods of treating clubfoot in many countries, which included a mix of surgical and conservative techniques. The Ponseti Method consists of 2 equally important phases: the Corrective Phase and the Maintenance Phase (Boden, Nuttall & Paton, 2011).

2.8.1 Ponseti Method Phases of Treatment

Corrective Phase: During the corrective phase, the position of the foot is gradually corrected using a series of manipulations and plaster of Paris casts, then finally a small outpatient procedure is performed to cut the Achilles tendon (tenotomy). The corrective phase usually takes 4–8 weeks and the baby is seen weekly for the treatment (Harnett et al 2011).

Maintenance Phase: Once the corrective phase has achieved a good position for the foot, the treatment is not over as the foot will tend to return to its deformed position, so the aim of the maintenance phase involves keeping the corrected position for the next 4–5 years. This is achieved by putting the child's feet into a brace for:

23 hours a day for the first 12 weeks.

Then at night-time until 4–5 years old. Harnett et al (2011).

CHAPTER THREE

METHODOLOGY

3.1 Study Site Description

The study took place at the Cape Coast Teaching Hospital located in Cape Coast, the capital of the Central Region and the Effia Nkanta Regional Hospital in Tarkoradi, the regional capital of the Western Region. These hospitals serve as the main referral center and receives cases from various regional, district, community-based health centers and maternity homes in both the private and the public sectors across the region. These hospitals have various departments which comprise Physiotherapy, Surgery, Internal Medicine, Pediatrics, Gynecology, Radiology, Pharmacy, Medical Laboratory with a blood bank, Pathology, Maternity, Dietetics, and well-equipped kitchen and cafeteria to cater for patient's needs. The system of record keeping is by the use of folders, charts, the LightWave Health Information Software (LHIMS), and Health Administration & Management Systems (HAMS) by the Ministry of Health and Ghana Health service.

3.2 Study Population

Past clubfoot records patients of all gender and ages who attended and received clubfoot rehabilitation in the physiotherapy department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospitals from January 2016 to December 2020 were considered in this study.

3.2.1 Inclusion Criteria

All first-time patients with a clubfoot who receive rehabilitation at the Physiotherapy unit of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospitals from January 2016 to December 2020.

3.2.2 Exclusion Criteria

Patients who receive clubfoot rehabilitation at the department within the research period but were not first-time patient will not be included.

3.3 Study Design

The retrospective cross-sectional study reviewed records of all clubfoot cases from the data storage system of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospitals from January 2016 and December 2020.

3.4 Sample Size Determination

This was a five-year retrospective study that reviewed the records of clients who presented with the clubfoot deformity between January 2016 and December 2020 hence sample size determination was not be applicable.

3.5 Sampling Method

Medical records (folder, treatment chart and card) and information on all clients who presented to the Physiotherapy department of the Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospitals between January 2016 and December 2020 were retrieved from the data storage system. Clubfoot deformities from those records were extracted and reviewed which was not be based on first - visit of patients.

3.6 Sample Collection

Data was collected from the electronic database, chart, and folders of patients. Folders and charts were reviewed independently. For each folder and chart, the age, gender, number of feet involved, and cause were retrieved and documented. To avoid multiple documentation, cases over the period under study were grouped into individual folder and chart which were numbered, sorted and filtered.

3.7 Data Analysis Method

The data obtained from this study was analyzed with the IBM Statistical Package for Social Sciences (SPSS) version 28.0.1. Results were expressed in terms of figures, percentages, tables, charts, and graphs. The prevalence of clubfoot was calculated for the total number of clients attending the pediatric units of the CCTH and ENRH. Inferences were made from the results and compared with findings from similar works discovered from literature.

3.8 Data Handling, Storage, and Usage

To ensure confidentiality, privacy, and anonymity, all data was obtained using a data retrieval form that will capture exact patient data. The forms were coded and data obtained was entered electronically and safely secured with a password to prevent access by an unauthorized person. Data collected was entered into an excel spreadsheet and protected with a password. Throughout the data collection process, all folders were used and kept in the records room of the hospital under lock and key.

3.9 Ethical Issues

The ethical approval for the study was sought from the Research and Ethics Committee of the University of Health and Allied Health Sciences. Furthermore, permission was obtained from the Head of department of the physiotherapy unit of the Cape Coast Teaching Hospital and the Effia Nkwanta Regional Hospital. Participants' respect, privacy and information confidentiality were upheld.

<p style="text-align:center">CHAPTER FOUR</p>
<p style="text-align:center">RESULTS</p>

4.1 Introduction

In this chapter analysis was made on the data collected from the hospitals and presented in tables and figures for each year.

The following tables and charts illustrate the summary of data retrieved from the two hospitals included in the study Cape Coast Teaching Hospital (CCTH) and Effia Nkwanta Regional Hospital (ENRH) within the five years intervals.

4.2 Prevalence of Clubfoot in Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital

The prevalence of clubfoot was computed for the population attending the pediatric units of the physiotherapy departments of CCTH and ANRH to be 76.80 and 54.3 per 100 pediatric attendances respectively. The average prevalence of the disease from 2016 to 2020 in CTH and ENRH stood at 15.36% and 10.86% respectively. The table 1below illustrates the trends in the prevalence of clubfoot from the periods of 2016 to 2020 for the two hospitals included in this study.

Table 1: Prevalence of club foot in Cape coast Teaching Hospital and Effia Nkwanta Regional Hospital (2016 to 2020)

	CCTH			ENRH		
Year	**Number of cases**	**Prevalence****	**Average prevalence**	**Number of cases**	**Prevalence****	**Average prevalence**
2016	39	19.90		13	14.9	
2017	30	12.40		13	7.9	
2018	44	14.30	*15.36*	20	10.1	*10.86*
2019	49	14.20		20	14.3	
2020	30	16.00		17	7.1	
Total	**192**	**76.80**		**83**	**54.3**	

$$** \quad Prevalence = \frac{Case}{Total\ paediatric\ attendace\ (per\ year)} \times 100$$

4.3 Demographic and Disease Characteristics of the Patients with Clubfoot at the hospitals.

Data retrieved from the two Hospitals saw a male dominance of almost 70% and 55% in 2019 at Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital respectively, details are as shown in Figure 2 below. Also, most of the cases were unilateral with regards to the number of feet involved; slightly above 70% of the cases retrieved from Cape Coast Teaching Hospital were unilateral in 2020 whiles Effia Nkwanta Regional Hospital also recorded more than half of unilateral cases in 2020. With regards to disease classification, majority of the cases were observed to be idiopathic. In 2020 for instance, findings revealed 86.70% and 82.40% idiopathic cases for Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital respectively. Only 13.75% and 17.3% syndromic cases were recorded in the two hospitals respectively (Table 4**).**

Demographic (age, gender, maternal occupation) and disease characteristics (number of feet involved, classification, severity and the number of casts applied to in the management) were analyzed using a non-parametric correlational analysis between these variables. Pearson correlation was used to determine relationships between the demographic and disease characteristics of participants such that a statistical difference will be established at P-value < 0.05.

The study revealed that age is positively correlated with the number of feet involved in the disease in cape coast teaching hospital [P-value = 0.046] (Table 5), it is however not correlated with any of disease characteristics in Effia Nkwanta Regional Hospital (Table 6). The findings also revealed a strong correlation between maternal occupation and severity of disease (P-value=0.000) and number of casts used (P-value=0.000) in cape coast teaching hospital (Table 5). However, in Effia Nkwanta Regional Hospital, Maternal occupation was only positively correlated with the number of casts used (P-value=0.007).

There was no statistical significance between maternal occupation and disease classification (P-value=0.399), severity (P-value=0.232) and number of feet involved (P-value=0.306).

The detailed analysis of demographic and disease characteristics are as shown in the tables 5 and 6 below.

Table 2: Gender classification of cases

CAPE COAST TEACHING HOSPITAL				EFIA NKWANTA REGIONAL HOSPITAL			
YEAR		FREQUENCY (N)	PERCENTAGE (%)	YEAR		FREQUENCY (N)	PERCENTAGE (%)
2016	MALE	19	48.70	2016	MALE	6	46.20
	FEMALE	20	51.30		FEMALE	7	53.80
2017	MALE	14	45.20	2017	MALE	9	46.20
	FEMALE	16	54.80		FEMALE	11	53.80
2018	MALE	25	68.20	2018	MALE	11	55.00
	FEMALE	19	31.80		FEMALE	9	45.00
2019	MALE	34	69.40	2019	MALE	11	55.00
	FEMALE	15	30.60		FEMALE	9	45.00
2020	MALE	19	63.00	2020	MALE	9	52.90
	FEMALE	11	37.00		FEMALE	8	47.10

Source: Field work

Table 3: Classification Per Number of Feet Involved

CAPE COAST TEACHING HOSPITAL				EFIA NKWANTA REGIONAL HOSPITAL			
YEAR		FREQUENCY (N)	PERCENTAGE (%)	YEAR		FREQUENCY (N)	PERCENTAGE (%)
2016	UNILATERAL	25	64.10	2016	UNILATERAL	8	**61.50**
	BILATERAL	14	35.90		BILATERAL	5	**38.50**
2017	UNILATERAL	12	41.90	2017	UNILATERAL	9	**65.50**
	BILATERAL	38	58.10		BILATERAL	4	**38.50**
2018	UNILATERAL	22	50.00	2018	UNILATERAL	13	**65.00**
	BILATERAL	22	50.00		BILATERAL	7	**35.00**
2019	UNILATERAL	25	51.00	2019	UNILATERAL	13	**65.00**
	BILATERAL	24	49.00		BILATERAL	7	**35.00**
2020	UNILATERAL	15	50.00	2020	UNILATERAL	12	**70.60**
	BILATERAL	15	50.00		BILATERAL	5	**29.40**

Source: Field work

Table 4: Classification of disease

CAPE COAST TEACHING HOSPITAL				EFIA NKWANTA REGIONAL HOSPITAL			
YEAR		FREQUENCY (N)	PERCENTAGE (%)	YEAR		FREQUENCY (N)	PERCENTAGE (%)
2016	IDIOPATIC	25	64.10	2016	IDIOPATIC	10	76.90
	SYNDROMIC	14	35.90		SYNDROMIC	3	23.10
2017	IDIOPATIC	26	87.10	2017	IDIOPATIC	10	76.90
	SYNDROMIC	4	12.90		SYNDROMIC	13	23.10
2018	IDIOPATIC	38	86.40	2018	IDIOPATIC	14	70.00
	SYNDROMIC	6	13.60		SYNDROMIC	6	30.00
2019	IDIOPATIC	38	77.60	2019	IDIOPATIC	12	60.00
	SYNDROMIC	12	22.40		SYNDROMIC	8	40.00
2020	IDIOPATIC	26	86.70	2020	IDIOPATIC	14	82.40
	SYNDROMIC	4	13.30		SYNDROMIC	3	17.60

Source: Field work

Table 5: Demographic and Disease Characteristics of the Patients with Clubfoot at Cape Coast Teaching Hospital

Bivariate / Partial		AGE	GENDER	MATERNAL OCCUPATION	NUMBER OF FEET	DISEASE CLASSIFICATION	SEVERITY
OCCUPATION	Pearson Correlation	-.219	.046				
	Sig. (1-tailed)	.065	.378				
NUMBER OF FEET	Pearson Correlation	.243*	-.119	.173			
	Sig. (1-tailed)	.046	.207	.117			
DISEASE CLASSIFICATION	Pearson Correlation	.231	-.039	-.037	.353**		
	Sig. (1-tailed)	.060	.395	.399	.006		
SEVERITY	Pearson Correlation	-.219	.046	1.000**	.173	-.037	
	Sig. (1-tailed)	.065	.378	0.000	.117	.399	
NUMBER OF CASTS	Pearson Correlation	-.219	.046	1.000**	.173	-.037	1.000**
	Sig. (1-tailed)	.065	.378	.000	.117	.399	0.000
MANAGEMENT OUTCOME	Pearson Correlation	.562[a]	-.298[aa]	.233	.000	712**	.183**
	Sig. (1-tailed)	.001	109	.092	1.000	.000	.010

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

a. Adjusted for age

aa. Adjusted for gender

Table 6: Demographic and Disease Characteristics of The Patients with Clubfoot at Effia Nkwanta Regional Hospital

Bivariate / Partial		AGE	GENDER	MATERNAL OCCUPATION	NUMBER OF FEET	DISEASE CLASSIFICATION	SEVERITY
MATERNAL OCCUPATION	Pearson Correlation	-.059	-.179				
	Sig. (1-tailed)	.403	.225				
NUMBER OF FEET	Pearson Correlation	.059	.179	-.121			
	Sig. (1-tailed)	.403	.225	.306			
DISEASE CLASSIFICATION	Pearson Correlation	.317	.082	-.043	.685**		
	Sig. (1-tailed)	.087	.365	.429	.000		
SEVERITY	Pearson Correlation	-.398*	.406*	.232	.314	-.106	
	Sig. (1-tailed)	.041	.038	.162	.089	.328	
NUMBER OF CASTS	Pearson Correlation	-.171	.209	.536**	.126	-.155	.715**
	Sig. (1-tailed)	.235	.188	.007	.299	.258	.000
MANAGEMENT OUTCOME	Pearson Correlation	.033[a]	.311[aa]	.333	.555*	.835**	1.000**
	Sig. (1-tailed)	.901	.255	.072	.021	.000	.000

*. Correlation is significant at the 0.05 level (1-tailed).

**. Correlation is significant at the 0.01 level (1-tailed).

a.   Adjusted for age

aa. Adjusted for gender

4.4 Management outcome of the patients who were managed with the Ponseti Rehabilitation approach.

The main management outcomes of the clubfoot using the Ponseti Rehabilitation approach were either the condition is corrected or defaulted. Analysis was made between the two hospitals included in the study across the five years (2016 to 2020). It was observed that the correction rate was higher in cape coast teaching Hospital across the 5-year period. Default rate was however observed to be higher in Effia Nkwanta Regional Hospital. For instance, in 2016 the correction rate stood at 89.7% and 46.2% of a total of 39 and 13 cases at Cape Coast Teaching Hospital and Effia Nkwanta respectively. Whiles default rate stood at 10.3% at Cape Coast Teaching Hospital in 2016, 53.8% default rate was recorded at Effia Nkwanta Regional Hospital.

Similarly, in 2020, 86.7% of the cases were corrected at Cape Coast Teaching Hospital whiles only 76.5% were corrected in Effia Nkwanta Regional Hospital. With the default rate, Cape Coast Teaching Hospital recorded only 13.3% and Effia Nkwanta Regional Hospital recorded 23.5% in 2020. Details are as shown in Table 7 below.

Summarily, the average correction rate between the two hospitals were 83.74% and 62.3% for CCTH and ENRH respectively. Whiles the average default rate recorded in the study between the two hospitals were 17.9% and 37.7% for CCTH and ENRH respectively.

Table 7: Management outcome of the patients who were managed with the Ponsenti Rehabilitation approach

CAPE COAST TEACHING HOSPITAL				EFIA NKWANTA REGIONAL HOSPITAL			
YEAR		FREQUENCY (N)	PERCENTAGE (%)	YEAR		FREQUENCY (N)	PERCENTAGE (%)
2016	CORRECTED	35	89.70	2016	CORRECTED	5	46.20
	DEFAULTED	4	10.30		DEFAULTED	8	53.80
2017	CORRECTED	26	80.60	2017	CORRECTED	8	53.80
	DEFAULTED	4	19.40		DEFAULTED	5	46.20
2018	CORRECTED	37	84.10	2018	CORRECTED	16	80.00
	DEFAULTED	7	15.90		DEFAULTED	4	20.00
2019	CORRECTED	38	77.60	2019	CORRECTED	11	55.00
	DEFAULTED	11	22.40		DEFAULTED	9	45.00
2020	CORRECTED	26	86.70	2020	CORRECTED	13	76.50
	DEFAULTED	4	13.30		DEFAULTED	4	23.50

From the correlation tables [Tables 1 and 2], analysis was done to establish relationships between demographic variables (age and gender) and management outcome when using the Ponsenti Rehabilitation approach. Findings revealed that, age is highly correlated with management outcome in CCTH (p value= 0.001) but not in ENRH (p value=0.901). Gender was however not correlated with management outcome in any of the two Hospitals.

With the disease characteristics, analysis revealed that disease classification (thus either idiopathic or syndromic) and severity of the diseases using the peranic score were associated with management outcome in both hospitals [Table 1, 2]. Also, findings showed that the number feet involved in the disease process was associated with management outcome in ENRH, however findings revealed no statistical significant between number of feet involved and management outcome in CCTH.

4.5 Summary

Table 8 below shows the summary of the total cases for the two Hospitals over the 5 years period with respective demographic and disease classifications.

Table 8: Summary table of comparison between the two hospitals over the five years

VARIABLE	SUB-CATEGORY	CCTH		ENRH	
		FREQUENCY (N)	PERCENTAGE (%)	FREQUENCY (N)	PERCENTAGE (%)
GENDER	Male	111	57.8	46	55.4
	Female	81	42.2	37	45.6
NUMBER OF FOOT	Unilateral	93	48.4	55	66.3
	Bilateral	99	51.6	28	33.7
CLASSIFICATION	Idiopathic	152	79.2	60	72.3
	Syndromic	40	20.8	23	27.7
MANAGEMENT OUTCOME	Corrected	162	84.4	53	63.9
	Defaulted	30	15.6	30	36.1

CHAPTER FIVE

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The discussion of the research as related to the objective of the study provides information relevant for determining the prevalence of club foot, demographic and disease characteristics as well as the management outcome of clubfoot using the Ponsenti approach in Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital.

5.2 Prevalence of Club Foot in Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital

In this study a total of 193 and 83 cases of clubfoot representing 76.8 and 54.3 per pediatric attendance were recorded in Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital respectively for the five years scope of study (2016 to 2020). The average prevalence however was 15.36 and 10.86 for CCTH and ENRH respectively. The study saw relativelty higher prevalence of clubfoot at the Cape coast teaching Hospital (CCTH) than Effia Nkwanta Regional Hospital (ENRH) which can be attributed to the fact that, CCTH is a teaching Hospital whiles ENRH is not secondary to the advancement in medical care in CCTH than ENRH. Moreover, the teaching hospital served more of referral point than the ENRH. These findings are inconsistent with other studies included in literature (Smythe et al., 2017; Banson, Egyin & Buunaaim, 2018; Boakye, Afiriyie & Abebrese, 2016). For instance, the study by Boakye, Afiriyie and Abebrese, (2016) who also conducted a five-retrospective study at the Konfo Anokye Teaching Hospital recorded a total case of 691 in the five years period. This can be attributed to the fact that Konfo Anokye Teaching Hospital attained the teaching Hospital status long before the CCTH, thus a lot of referral cases are taken there than the hospitals included in this study, thus higher cases are seen there.

Findings of the study saw a male dominance (157) over females (125) in the two hospitals with most of the case being idiopathic than syndromic. These findings are also in congruence with other studies such as that of Banson, et al. (2018) who reported in their study in the Northern region of Ghana with twice as many males than females having the condition. Idiopathic clubfoot and bilateral manifestations were the most common disease presentations for the 2015 to 2016 period among 112 babies (Banson et al., 2018).

5.3 Demographic and Disease Characteristics of The Patients with Clubfoot at the hospitals

In the cape coast teaching hospital, age is positively correlated with the number of feet involved in the disease (P-value = 0.046) while it is not correlated with any of the disease characteristics in the Effia Nkwanta Regional Hospital. In the Cape Coast Teaching Hospital, the findings also revealed a high link between maternal occupation and disease severity (P-value=0.000) and the number of casts required (P-value=0.000). Maternal occupation was only positively linked with the number of casts used (P-value=0.007) in Effia Nkwanta Regional Hospital. The relationship between mother's occupation and disease classification has little statistical significance. The link between maternal occupation and disease severity and the number of cast used in the treatment of the disease at the CCTH can as a result of the fact that mothers who belong to the formal sector (government employed) are able to make enough financial commitment into the care of their children, thus correlating with the number of cast used and the severity such that, the higher the severity, the higher the number of cast used.

There is however a paucity of literature that tries to establish relationships between demographics and disease characteristics of clubfoot, especially in Sub-Saharan Africa and Ghana.

5.4 Management outcome of the patients who were managed with the Ponsenti Rehabilitation approach.

This study could not establish any relationships with gender and management outcome in the two hospitals, however it was established that age is correlated to management outcome in CCTH such that the older the client, the lesser the possibility of being corrected and vice versa. These findings are consistent with those of Byron and Wallander (2015) who similarly reported a relationship between age and management outcome of clubfoot.

This current study also revealed a relationship between disease classification (either idiopathic or syndromic) and severity of the diseases and management outcome in both hospitals. The study however was not able to tell which of classifications (idiopathic or syndromic) are more easily corrected, thus recommends further studies to be done to make these establishments. Other studies also established that Idiopathic bilateral clubfoot was more severe than unilateral foot at initial presentation and required a greater number of corrective casts which are predictors of management outcome (Anil et al. 2018).

5.5 Conclusion

Conclusively, the study saw relatively high prevalence of clubfoot in the cape coast Teaching Hospital which is attributable to the fact that Cape Coast Teaching Hospital serves more of referral Hospital for Central Region than the Effia Nkwanta Governmental Hospital which is a regional hospital. With demographic and disease characteristics, age is positively correlated with the number of feet involved in the disease and management outcome in Cape Coast Teaching Hospital while it is not correlated with any of the disease characteristics in the Effia Nkwanta Regional Hospital.

Mothers' occupation was observed to be strongly linked with the number of casts used in treating the child in both hospitals. Finally, the Pirani assessment scores revealed a higher

correction rate in Cape Coast Teaching Hospital, thus relatively higher default rate in the Effia Nkwanta Regional Hospital.

5.6 Recommendations
Clinical practice

- Hospitals should include early diagnosis and early initiation of treatment of the disease in other to increase the correction rates.

- Educational drives to inform parents of the implications of clubfoot should be undertaken in all OPDS and outreaches, as well as teaching them preventative methods, such as correct antenatal lifestyles.

Policy formation

- Insurance policies should include free treatment or caste used for the treatment so that people are able to asses care regardless of their financial status.

Research implications

- Future research studies should be a prospective in nature to be able to reach a wide range sample size to achieve more comprehensive results.

- Further studies should be conducted in Ghanaian communities targeting various study populations e.g., clients who have never presented to the hospital as a result of stigma or any other reasons.

- Future studies should include the treatment modules that are more client friendly than the Ponsenti treatment methods.

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APPENDIX I

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RESEARCH ETHICS COMMITTEE

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Ho Volta Region
Ghana

My Ref: **UHAS-REC A.1 [10] 21-22**

19th August, 2021

ETHICAL CLEARANCE CERTIFICATE

The Research Ethics Committee of the University of Health and Allied Sciences reviewed and unanimously approved your research proposal on agenda **for Initial Submission** at its full board meeting held on 18th August 2021 subject to the conditions provided below.

Protocol Identification Number:	**UHAS-REC A.1 [10] 21-22**
TITLE OF PROTOCOL:	**"Prevalence and management outcome of clubfoot in Ghana A 5-year retrospective study of two Tertiary Hospital, Cape Coast Teaching Hospital and Effia Nkwanta Region Hospital."**
INVESTIGATORS:	David Adjei Ampofo Dortthy Araba Mensah Gideon Darkwah Otchere
REPORTING:	This approval requires that you submit six-monthly review reports of the protocol to the Committee and a final full review to the Research Ethics Committee at the completion of the study.
	You are required to report all serious adverse events related to this study to the Committee within seven (7) days verbally and fourteen (14) days in writing.
MONITORING:	The Committee may observe, or cause to be observed, procedures and records of the study during and after implementation.
MODIFICATION:	Please note that any significant modification of this project must be submitted to the Committee for review and approval before its implementation.
PUBLICATION:	As part of the review process, it is the Committee's duty to review the ethical aspects of any manuscript that may be produced from this study. You will therefore be required to furnish the Committee with any manuscript for publication.
EXPIRY DATE:	**This ethical clearance is valid till 18th July, 2022.**

Please always quote the protocol identification number in all future correspondence in relation to this protocol.

....

REV DR. LAWSON DZANKU
CHAIRPERSON, RESEARCH ETHICS COMMITTEE

cc: Director, IHR
     Dean, SAHS.

APPENDIX 1I

UNIVERSITY OF HEALTH AND ALLIED SCIENCES
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September 09, 2021

Ref: UHAS-REC A.1 [10] 21-22

The Chief Executive Officer,
Cape Coast Teaching Hospital
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Dear Sir/Madam,

PERMISSION TO COLLECT DATA IN YOUR FACILITY

I kindly seek your approval for the following final year students of the Department of Physiotherapy and Rehabilitation Sciences, University of Health and Allied Sciences, Ho, to conduct their research in your facility on the topic: **Prevalence and management outcome of clubfoot in Ghana. A 5-year retrospective study of two tertiary hospitals. (Cape Coast Teaching Hospital and Effia Nkwanta Regional Hospital).**

   i. David Adjei Ampofo (Principal investigator)
  ii. Dorothy Araba Mensah (Co-Principal Investigator)
 iii. Gideon Darkwah Otchere (Co-Principal Investigator)

This request has become necessary to enable them fulfil the requirements of their Bachelor's degree in Physiotherapy and Rehabilitation Sciences.

I look forward to your support in this endeavour.

Thank you.

Yours sincerely,

Dr. George Aboagye
Head of Department

APPENDIX 1II

UNIVERSITY OF HEALTH AND ALLIED SCIENCES
SCHOOL OF ALLIED HEALTH SCIENCES
DEPARTMENT OF PHYSIOTHERAPY AND REHABILITATION SCIENCES

Telephone: +233(0)202993078
E-mail: dprs@uhas.edu.gh

PMB 31,
Ho, Volta Region

September 09, 2021

Ref: UHAS-REC A.1 [10] 21-22

The Medical Director
Effia Nkwanta Regional Hospital
P.O. Box 229
Sekondi

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Yours sincerely,

Dr. George Aboagye
Head of Department

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APPENDIX V

UNIVERSITY OF HEALTH AND ALLIED SCIENCES
SCHOOL OF ALLIED HEALTH SCIENCES
DEPARTMENT OF PHYSIOTHERAPY AND REHABILITATION SCIENCES

Telephone: +233(0)202993078
E-mail: dprs@uhas.edu.gh

PMB 31,
Ho, Volta Region

September 09, 2021

Ref: UHAS-REC A.1 [10] 21-22

The Chief Executive Officer,
Cape Coast Teaching Hospital
P O Box CT 1363.
Cape Coast.

RECEIVED
08 APR 2022
Time 9:36am

Dear Sir/Madam,

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Dr. George Aboagye
Head of Department

APPENDIX VI: Data Collection Sheet

DATA COLLECTION SHEET - PREVALENCE AND MANAGEMENT OUTCOME OF CLUBFOOT IN GHANA: A 5-YEAR RETROSPECTIVE STUDY OF TWO TERTIARY HOSPITALS.

(CAPE COAST TEACHING HOSPITAL AND EFFIA NKWANTA REGIONAL HOSPITAL)

Patient Hspt.NO.	Gender	Age (0-1,1-2,2-3,3-4 and Above 4)	Parent Occupation (Employed, self employed Unemployed)	Number of Feet Involved (Unilateral or Bilatera)	Cause / Classification (Idiopathic or Syndronemic	Severity of Deformity (Mild, Moderate, Severe)	Number Of Casts Used (1-6, 7 – 10, 10 & above)	Treatment Method Used (Ponsenti method)	Treatment Outcome (Corrected or Defaulted Treatment)

Key				
Gender	Male = 1	Female = 2		
Age (Months)	0 -12 = 1	13 - 24 = 2	25-26 = 3	≥ 36
Cause	Idiopathic = 1	Syndronmic = 2		
Number Of Foot	Unilateral = 1	Bilateral = 2		
Outcome	Corrected = 1	Defaulted = 2		
Occupation	Employed = 1	Unemployed = 2		
Severity	Mild = 1	Moderate = 2	Severe = 3	
Number Of Casts	1-6 = 1	7 - 10 = 2	10 & Above = 3	