



Faculty of Medicine

University of Dhaka

**Effects of Educational Booklet among Children with Club foot
during Bracing Stage of Treatment by Ponseti Method**

By

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Master of Science in Physiotherapy

Session: 2017-2018

Registration No: 3610

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Department of Physiotherapy

Bangladesh Health Professions Institute (BHPI)

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Submitted in Partial Fulfillment of the Requirements for the Degree of

Master of Science in Physiotherapy



Department of Physiotherapy

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May 2019

We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for acceptance of this thesis entitled, **“Effects of Educational Booklet among Children with Club foot during Bracing Stage of Treatment by Ponseti Method”**, submitted by Ershad Ali, for the partial fulfillment of the requirements for the degree of Master of Science in Physiotherapy.

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Supervisor's Statement

As supervisors of Ershad Ali's M. Sc Thesis work, I certify that I consider his thesis **“Effects of Educational Booklet among Children with Club foot during Bracing Stage of Treatment by Ponseti Method”** to be suitable for examination.

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Declaration Form

- This work has not previously been accepted in substance for any degree and is not concurrently submitted in candidature for any degree.
- This dissertation is being submitted in partial fulfillment of the requirements for the degree of M.Sc in Physiotherapy.
- This dissertation is the result of my own independent work/investigation, except where otherwise stated. Other sources are acknowledged by giving explicit references. A Bibliography is appended.
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List of Abbreviations

ADL	Activities of daily living
BC	Before Christ
BHPI	Bangladesh Health Professions Institute
BMRC	Bangladesh Medical Research Council
BSMMU	<i>Bangabandhu Sheikh Mujib Medical University</i>
BgSH	Bagerhat Sadar Hospital
CRP	Centre for the Rehabilitation of the Paralysed
CTEV	Congenital talipes equinovarus
FAB	Foot Abduction Orthosis
GF	Glencoe Foundation
ICMH	<i>Institute of Child and Mother Health</i>
IRB	Institutional Review Board
MMCH	Mymensingh Medical College Hospital
PM	Ponseti Method
PMR	Posterior Medial Release
PSOSK	Protibondhi Seba O Sahajjo Kendro (PSOSK)
SkSH	Satkhira Sadar Hospital
SD	Standard Deviation
USA	United States of America
USG	Ultrasonography
WHO	World Health Organization
WFL	Walk for Life

Abstract

Background: Congenital talipes equinovarus is complex congenital deformity of foot which is commonly named as club foot (Hargava et al., 2013). Club foot is the most common deformity characterized by equinus, varus, cavus and adductus (Munambah, Chiwaridzo, & Mapingure, 2016). The purpose of the study was to identify effects of educational booklet among children with clubfoot during bracing stage of treatment by Ponseti method. **Methodology:** This study was a quantitative type quasi-experimental research design. Sample size was 360 for this study. Sampling technique was a convenient sampling technique. Exercises applied with educational booklet to the booklet group or experiment group and only usual exercises applied to the non-booklet group or the control group. A pre-test (before exercises provided by educational booklet) and post-test (after exercises provided by educational booklet) as well as a pre-test (before usual exercises provided by verbal instruction) and post-test (after usual exercises provided by verbal instruction) was administered with each subject of both groups to compare the effects on children with club foot during bracing stage of treatment by Ponseti methods. **Results:** The mean Pirani score before providing exercises with educational booklet for right feet among the clubfoot babies were 0.56 ± 0.33 (Booklet group) and after providing exercises with educational booklet for right feet among the clubfoot babies were 0.43 ± 0.41 (Booklet group)). Statistically it was found highly significant ($t= 2.99, p < 0.0003$). So it was concluded that exercises with educational booklet had significant influence on Pirani score reduction for right feet among the clubfoot babies. The mean Pirani score before providing usual exercises for left feet among the clubfoot babies were 0.5 ± 0.15 (Non-booklet group) and after providing usual exercises for left feet among the clubfoot babies were 0.53 ± 0.48 (Non-booklet group)). Statistically it was found significant ($t= - 0.059, p < 0.056$). So it was concluded that usual exercises without educational booklet had influence on Pirani score increased for left feet among the clubfoot babies. **Conclusion:** There was significant role of exercises with educational booklet rather than usual exercises by verbal instructions among children with clubfoot during bracing stage of treatment.

Key words: Ponseti method, Educational booklet and Exercises

1.1. Background

Disability is a major public health problem in the worldwide and physical disabilities are common which can affect socioeconomic development (Herman, 2006). Disability burden is health problem in developing countries which not relatively recognized (Shawky, Abalkhail & Soliman, 2002). It is estimated according to one study that 15% people are disabled in worldwide (World Bank disability facts and statistics, 2009). UN development programme in 2004 reported that about 80% of person with disability lived in developing country. Bangladesh is also a developing country in the World as well as disability is the most common challenging issue in Bangladesh. Disability is a significant developmental problem and there is linked between poverty, disability and equity (WHO, 2007).

Clubfoot is a physical type of disability. Club foot can be detecting in early life and if untreated it leads more disabling with age (Herman, 2006). Neglected club foot or not completed treatment of club foot can dramatic change in quality that causes physical impairments, ambulation problem, difficulties to do common tasks, dependency for ADL with much economic impact on the family as well as society. This is also related to club foot that associated with social stigma which may lead psychological effect of children with club foot (Herman, 2006).

Rehabilitation is essential and well known component in health care systems in worldwide (WHO, 1995). The purpose of rehabilitation for children with clubfoot is to correct the impairment, to improve function, to prevent activity limitations, to prevent participation restrictions, and to improve the quality of life (Pal, Chaundhury, Sengupta & Das, 2002). Physiotherapists are an important person of club foot treatment team not only in developed countries but also in developing countries (Shack & Eastwood, 2006). There is a significant role of Physiotherapists for treating children with club foot as well as educate the parents/caregivers about the condition, assessments, diagnosis, treatment procedure and the treatment outcome (Ireland, 2003).

Early detection of club foot, actual assessment and early intervention are essential for achieving excellent treatment outcomes (Shack & Eastwood, 2006). The birth of a baby is a major celebrated event for parents and the parents are initially shocked after first observing the baby's deformity and an experienced by emotional distress like anxiety, depression and anger (Esan, Akinsulore, & Adegbehingbe, 2017). The process of treating child with club foot involves diagnosis, treatment and follow-up which is very stressful for the parents (Esan, Akinsulore, & Adegbehingbe, 2017).

1.2. Justification

Club foot is most common musculoskeletal deformity at birth and the incidence of club foot 1.2 per 1000 live births (Malagelada, Mayet, Firth, & Ramachandran, 2016). Untreated or incorrectly treated clubfoot leads to lifelong disability which is responsible for negative impacts on the society (Alam et al., 2014). This is very important factors to build up awareness about clubfoot treatment, treatment places, treatment method, and effects of treatment. CTEV is the curable condition if provided treatment properly. There are some treatment options for clubfoot treatment in which Ponseti method is very simple, easy, cost effective, outcome oriented treatment protocol.

Ponseti methods are included manipulation, casting, tenotomy and maintain brace up to five years of children age.

This is very important and significant issue to know about baseline characteristics of children with club foot in Bangladesh for gaining knowledge about club foot. Baseline characteristics includes age, education, occupation of parents as well as age, sex, family income, caregivers, family history, family members, nuclear or joint family, living places etc of children with club foot. This study is also important for developing research as creating hypothesis about the club foot and this hypothesis will be able to conduct many researches about the condition. Club foot is the condition that can recurrent after treatment due to lack of wearing brace as well as therapeutic exercises. Educational booklet is used to prevent relapse of club foot during bracing stages of treatment.

1.3. Operational Definitions

Clubfoot:

Clubfoot is a congenital deformity of foot which is characterised by cavus, adductus, varus and equinus.

Cavus:

Cavus foot is a condition in which the medial border of foot has a very high arch with angle in mid point.

Adductus :

Adductus is a component of foot deformity. The bones in the front half of the foot bend or turn in toward the body.

Varus:

Varus is the angling or inverted position of the bones in the front of the foot in relation to the heel.

Equinus:

Equinus is a condition in which the upward bending motion of the ankle joint is limited.

Ponseti clubfoot management technique:

Ponseti method is the standard technique for clubfoot treatment which was started within the first 2 weeks after delivery of child with clubfoot usually (Khan et al., 2010). Ponseti method briefly described by weekly serial gentle manipulations and castings, in this method commonly 4-8 serial casts were needed and it was assessed of foot after removal of the last cast for observing the correction, if there any residual equinus was treated by percutaneous tenotomy of the Achilles Tendon and this tenotomy was performed under local anaesthesia (Khan et al., 2010). Finally another cast is applied after tenotomy for 3 weeks for healing of Achilles tendon (Khan et al., 2010).

Foot Abduction Orthosis (FAB):

After removing the tenotomy cast foot abduction orthosis (FAB) is used for preventing relapse. FAB is used 23 hours every day for the first 3 months and then gradually reduced up to 12-14 hours during night and naps for 5 years. Exercises and some instruction are advised to parents during brace is in or out (Khan et al., 2010).

Socio-demography:

Socio-demographic characteristics of a population expressed statistically, such as age, sex, education level, income level, marital status, occupation, religion, birth rate, death rate, average size of a family.

Pirani Scoring System for Clubfoot Treatment

The Pirani scoring system was created by Shafiq Pirani. He is a medical doctor of Vancouver, British Columbia, Canada. The Pirani scoring system is used by Ponseti practitioner to determine the severity of CTEV. The Pirani scoring system consists of 6 components, three component for the hindfoot and another three component for the midfoot. Hind foot component of pirani scoring system included posterior crease (PC), empty heel (EH), and rigid equinus (RE) as well as mid foot included curve lateral border (CLB), medial crease (MC), uncovering of the lateral head of the talus (LHT). Each category of this component is scored as 0, 0.5, or 1. The least (best) total score for all categories combined is 0, and the maximum (worst) score is 6.

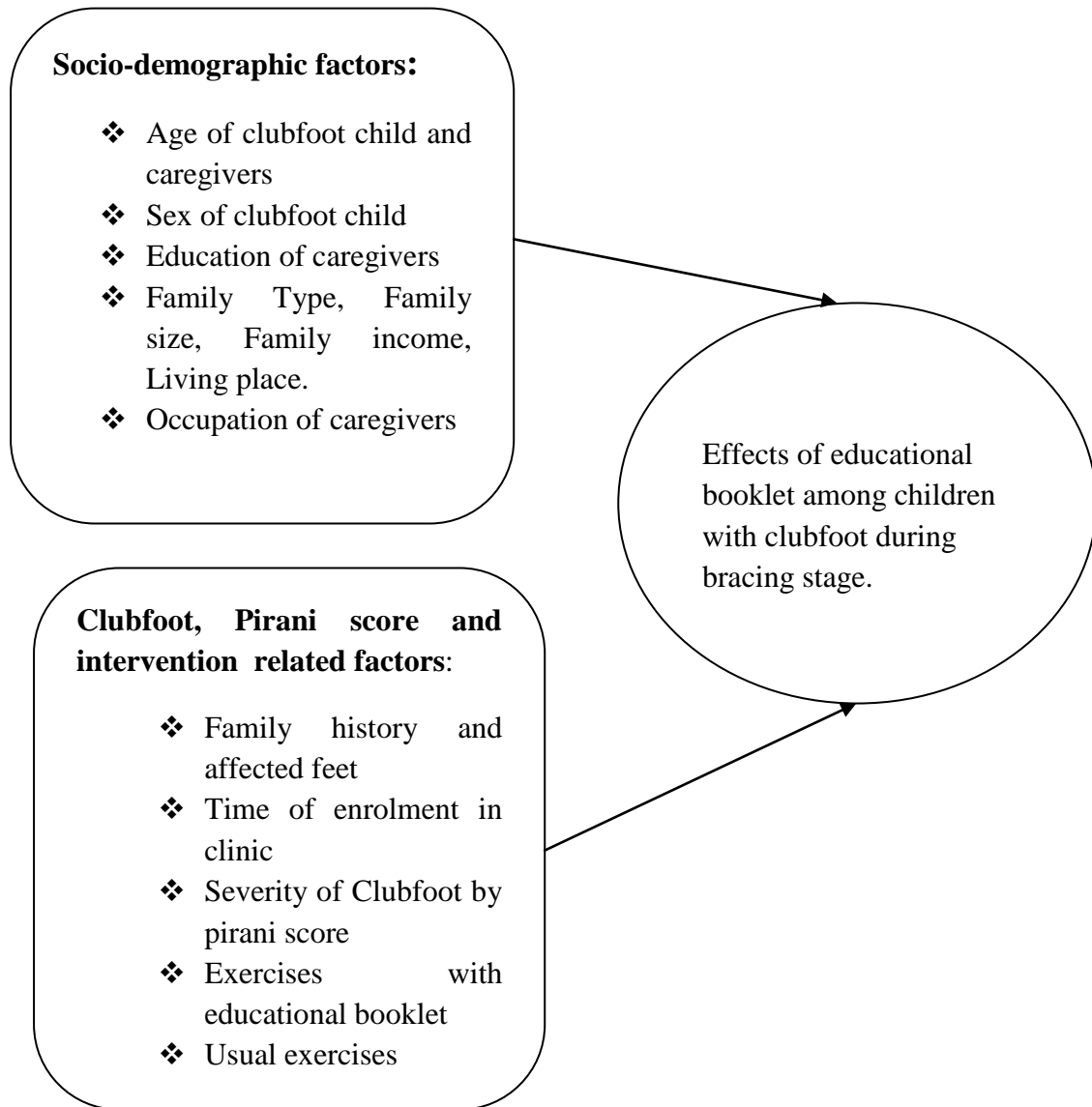


Figure-1: Clubfoot

1.4. Conceptual framework:

Independent variables

Dependent variable



1.5.1. General objective

To identify effects of educational booklet among children with clubfoot during bracing stage of treatment by Ponseti method.

1.5.2 Specific Objectives

- To find out the socio-demographic characteristics of participants.
- To identify family history of Clubfoot.
- To detect unilateral or bilateral clubfoot.
- To explore time of enrolment in clinic of children with clubfoot
- To determine the severity of clubfoot during bracing stage of treatment.
- To determine the severity of clubfoot during bracing stage of treatment.
- To assess the severity of clubfoot during bracing stage of treatment after three months from first assessment.

1.6. Null hypothesis (H₀):

Specific exercises with educational booklet are not effective than usual exercises among children with clubfoot during bracing stage of treatment by Ponseti method.

1.7. Alternative Hypothesis (H₁):

Specific exercises with educational booklet are more effective than usual exercises among children with clubfoot during bracing stage of treatment by Ponseti method.

In this chapter, the literature review gives an overview of club foot, epidemiology of clubfoot, etiology of clubfoot, patho-physiology of clubfoot, the consequences of club foot and treatment of club foot.

2.1. Clubfoot overview

Congenital talipes equinovarus (CTEV) is complex congenital deformity of foot which is commonly named as club foot (Hargava et al., 2013). Club foot (CTEV) is the most common deformity characterized by equinus (plantarflexion), varus (inversion), cavus (high arch) and adductus (Munambah, Chiwaridzo, & Mapingure, 2016). It is a structural defect where foot is inwardly rotated and pointed downward, and the fore-foot is pronated toward the heel in which the bones of the foot & ankle are fixed in malposition ((Werler et al., 2014). It is most common than other combination foot deformities like calcaneovalgus, equinovalgus and calcaneovarus (Anand & Sala, 2008).

2.2. Epidemiology of clubfoot

There is variation of the incidence of children with club foot in the globe reported by different studies because of variations in nations, population and site of the geographical location (Roye & Roye, 2002).

The estimated club foot born per year in Bangladesh is about 4373, and an incidence of club foot is 1.2/1000 births (Shawky, Abalkhail, & Soliman, 2002). Estimated 5000-6000 children with club foot deformity are born every year in Bangladesh and Myanmar, which is almost one of every 1000 children with this club foot deformity born our country (Alam et al., 2015). Another study showed that estimated 5000 Bangladeshi children are born with CTEV each year as well as with incidence about at 1: 900 births (Ford-Powell et al., 2013). Club foot was affected nearly 1–2per 1000 live births worldwide and 80 %) of club foot occurs in developing countries (Munambah et al., 2016). Club foot is public health problem that remains comparably undiagnosed and about 220000 babies born each year in developing countries (Alam et al., 2015).

One of the study reported that estimate incidence of club foot is 1 per 1000 births in America and the United Kingdom, also mentioned that men more affected than women where ratio of 2:1 (Moorthi et al., 2006). Though another finding suggested that an incidence of 2 to 3 per 1000 births in developed countries (Pandey & Pandey, 2003) as well as the incidence of club foot in black South African children is 3.5/1000 births (Ballantyne, & Macnicol, 2002). One of the researches conducted in the USA by Morcuende, Doran, Dietz & Ponseti (2004) reported that 2224 children with club foot are born yearly and estimated an incidence of 0.6 cases per 1000 live births.

Barker, Chesney, Miedzybrodzka, & Maffulli (2003) described by another similar study which estimated the incidence of children with club foot to differ from 0.64 to 6.8 per 1000 live births worldwide as well as also suggested an incidence of 2.57 per 1000 births in the USA. Carey, Bower, Mylvaganam and Rouse (2003) reported that an incidence of 1.25 per 1000 births in Western Australia where males affected more than females. Barker et al (2003) in Hawaii represented that an incidence of 6.8 per 1000 births among the resident as well as also reported that East and Central Africa together with Polynesia have more an incidence of children with clubfoot of 8 per 1000 births. There was no available on incidence and prevalence of children with clubfoot in as like as developing countries in Uganda (Herman, 2006). Another study conducted in Zimbabwe where got the incidence of children with clubfoot 0.9 per 1000 births (Madzivire, Useh, Mashegede & Siziya, 2002).

2.3. Etiology of clubfoot

One of the study reported that the exact etiology of children club foot is unknown but different Epidemiological research identified several factors such as increased uterine pressure, abnormal foetal positioning, constriction bands, temperature changes, unstitched uterus and placental insufficiency which linked to the etiology of clubfoot (Herman, 2006). There are two intrinsic and extrinsic causes which influences on the developing foetus; the intrinsic factors include chromosomal abnormality and sex linked genes where the extrinsic factors include the intrauterine environment (Baker et al., 2003). On the other hand Chapman et al (2000) described that a single dominant gene is also responsible for the development of children with clubfoot. Chromosome defects, vascular & neuromuscular abnormalities, viral

causes, spina bifida and arthrogyrosis are also related to children with clubfoot and this type of children with clubfoot is very difficult to treat (Faules & Luther, 2005).

Exact causes of club foot are poorly understood except genetic factors (Hargava et al., 2013). CTEV can be visualized by USG at 12 weeks of gestation, though its pathogenesis is unknown (Werler et al., 2014). It also related condition of secondary to connective tissue maldevelopment, some genetic factors, maternal smoking during pregnancy and primiparity, various environmental exposures and some specific medications (Werler et al., 2014). Multifactorial causes are responsible for clubfoot and pathogenesis of clubfoot till not clears (Okoński, Misztal-Okońska, Okoński, Książek, & Goniewicz, 2017).

2.4. Patho-anatomy of clubfoot

Complexities of the children with club foot deformity has been described by different anatomical research for understanding properly as well as clear understanding of club foot deformities and the correlation between the tarsal bones remains controversial (Pandey & Pandey, 2002). Club foot has four features like rigid equinus or foot is in plantar flexion, cavus or increased longitudinal arch of foot, varus or heel turned in and adductus or fore foot in adduction (Mocuende, 2006). Talus and calcaneus of club foot are medially rotated as well as plantar flexed (Roye & Roye, 2002). The hyaline cartilage develops not normally in joints of the clubfoot due to it is not articulated with the other joints and subluxed navicular bone. Spring and deltoid ligaments combined with the posterior tibialis tendon become shortening which causes occur inverted and adducted of foot (Herman, 2006).

According to anatomical view of club feet showed that the calcaneus, navicular and cuboid bones are medially rotated to the talus as well as adduction and inversion become by extreme tight ligaments, tendons; furthermore, navicular bone is severely displaced that close to medial malleolus which articulates with the medial surface of the head of the talus (Ponseti, 1997). Gastrocnemius, tibialis posterior and toe flexors are shortened, atrophied as well as posterior and medial side of the ankle ligaments and tarsal joints ligament are very thick, taut and shortened which lead to equinus foot; Shortening of the talocalcaneal ligament and joint capsules on the

medial side of the foot are responsible for the adduction and varus deformities of the club foot (Herman, 2006).

2.5. Consequences of clubfoot

Untreated CTEV lead to permanent disability which can create difficulties in walking, playing and perform ADL such as individual-care (Van Wijck, Oomen, & van der Heide, 2015). Neglected clubfoot causes lack of social integration, long term psychological burden, and financial burden for the family as well as the community (Pulak, & Swamy, 2012).

2.6. Diagnosis of clubfoot

The diagnosis of clubfoot usually occurs through screening during pregnancy and after birth when the child started treatment and the management of clubfoot deformity depends on the severity and pathophysiological changes of the deformity (Tassadaq et al., 2016). Diagnosis is the first step of the treatment process of any disease condition where an assessment, diagnosis and treatment interrelated (Bussing, Zima, Gary & Garvan, 2003). Different study suggested that early detection of disease especially for the children is very important by which interventions can be determined (Salako et al., 2001). CTEV can be visualized by USG at 12 weeks of gestation (Werler et al., 2014). The clubfoot deformity is easily detected from birth due to structural nature by birth attendants, professional doctors during delivery of children with clubfoot (Konde-Lule et al, 2005). Children with clubfoot can easily be identified by parents especially by mother during her routine examination. It is also reported that less awareness by the parents/ caregivers about the condition of illness they do not know where to go for better treatment (Seedat, Stein & Wilson, 2002).

2.7. Management of children with clubfoot

There are some methods for correcting club foot to improve function, to prevent activity limitation and participation restrictions that results become children with club foot improve physical and social function; as a result of club foot correction this is not only reduces stress among parents, caregivers and family members, but also diminished social stigma (Herman, 2006). Most of the children with clubfoot have limited access to received treatment because of their poverty and lacking of awareness (Alam et al., 2014). One study found that only 10% of children with club foot are able

to receive treatment from specialist due to inadequate awareness, poor communication, travelling expenses and parental responsibilities of family. Currently, only 2% out of one million people with disabilities received rehabilitation services (Alam et al., 2014). Lack of information makes it difficult for health provider and health planners to show the impacts in treatment on health status or weigh the cost or the ratio of benefits to the patients for prescribing costly treatment. So, this is very important for the parents to understand children's treatment and barriers of treatment (Alam et al., 2014). During the treatment of clubfoot patients compliance is very important for the therapeutic intervention to be effective. One study in Ghana found that level of awareness along long travelling, cost of treatment, long waiting time and negative attitudes of health providers were major barriers to use of health services (Alam et al., 2015). There is limited access for getting treatment of clubfoot children because of poor access to healthcare and lack of awareness in developing country (Alam et al., 2014).

One of the study reported that only 10% of children with clubfoot are capable to received treatment from an expert in East Africa because of inadequate awareness, poor communication, travel expenses and more responsibilities of parents for family care (Scott & Evans, 1997).

Aims of club foot treatment are to get and keep up correction of the foot for achieving functional, pain-free, plantigrade with good mobility and without calluses foot (Gupta, Singh, Patel, Patel, & Varshney, 2008). There were some treatment options of clubfoot have in the past such as the Kite method, French taping method and surgery (Nogueira, Fox, Miller, & Morcuende, 2013).

Above 19500 children with club foot were included for treatment at walk for life (WFL) in Bangladesh from 2009 to 2017 (Ford-Powell, Barker, Khan, Evans & Deitz, 2013). WFL is a project of the Glencoe Foundation as well as the National Clubfoot Programme of Bangladesh which acknowledged by the Government of Bangladesh. Nonsurgical Ponseti method was used for treating children with club foot at WFL (Rahman, et al., 2018). There are another two organization provided club foot treatment in Bangladesh such as Zero club foot as well as CRP-Savar.

There are two main treatment options are used to correct children with club foot such as non-surgical and surgical treatment (Colburn & Williams, 2003).

2.7.1 Non-surgical treatment

Non-surgical treatment is the option of club foot treatment for achieving a functional foot. Non-surgical methods have used from ancient by using of massage, splintage and adaptive footwear, after that day by day used manipulations and plaster casts (Pandey & Pandey, 2003). It was also passed through various options using in non-surgical treatment by egg yolk immersed rag wrapping, adhesive strappings, plaster of Paris, other material splints and different types of surgical boots (Pandey & Pandey, 2003).

Non-surgical treatment methods are usually used which is suggested in different literature such as French physiotherapy method (Richards, Johnston & Wilson, 2005), Kites method (Roye & Roye, 2002) and the Ponseti method (Colburn & Williams, 2003).

Casting and splinting are the main methods of nonsurgical treatment in North America as well as only physiotherapy and continuous passive movement used in Europe without immobilization by using plaster cast (Roye & Roye, 2002).

French physiotherapy technique include daily stretching of shortened soft tissues, cutaneous stimulation of the weakened peroneal muscles, passive mobilisation followed by temporary immobilization by elastic and non elastic adhesive taping for 20 months (Richards, Johnston & Wilson, 2005).

French physiotherapy technique is the long-term treatment procedure where need better cooperation from the parent during daily treatment sessions in performing stretching, passive mobilisation exercises and strapping of the foot everyday at home for getting good treatment results (Fauks & Luther, 2005). French physiotherapy technique may not be effective for some older child as well as treatment duration is also so long (Bensahel, Guillaume, Czukonyi, & Desgrippes, 1990). But French physiotherapy technique is effective for correcting newborns with club foot. Although French physiotherapy technique is outcome oriented in Europe, but there is no

available literature about in developing countries including in Africa about treatment outcome of French physiotherapy technique (Herman, 2006).

One of the other methods for treating children with club foot is Kite which methods are used for correcting children club foot in many countries in Africa (Roye & Roye, 2002). The Kite method includes three-point pressure to the foot medially and everting the heel as the foot is abducted followed by using below the knee cast. Cast is altered per week for the first six weeks after that cast is changed every two weeks till 4-6 months of age. Average duration is suggested for this technique about 20 months in casts followed by use of a brace for longer duration of time (Noonan and Richards, 2003).

Although Kite method have got successful results, but it has some criticism from many researchers due to only 15% of children with club foot responds satisfactory result by the Kite method as well as need surgery to correct for others remaining cases (Roye & Roye, 2002). This is too three years long cast treatment for the child with club foot to correct foot where also used incorrect manipulation which is argued from many researchers in Kite method (Dobbs, Morcuende, Gurnett, & Ponseti, 2000). The Kite method was widely used before the introduction of the Ponseti technique in 1999 in Uganda. Norgrove is also argued with Kite's methods and reported that unsatisfactory results achieved by this methods.

Ponseti has modified Kite's casting technique by the application of external rotation of the foot around the talus for correcting adduction and applied a long cast from toes up to the mid-thigh as well as equinus corrected by Achilles tenotomy and foot abduction brace used for maintaining abduction of the corrected foot (Roye & Roye, 2002).

The modern treatment of clubfoot is Ponseti methods which are very effective, outcome oriented and less invasive surgical procedure. The club foot and its treatment procedure has an impact on the child's social environment and family life and also it is not a life threatening disorder of the foot but there is a strong impact on child, caregiver and family member especially on parents (Tassadaq et al., 2016). The management of child with club foot should be highlighted on educational, sociological and emotional support for the family. The mother develop some level of

stress after looking club foot deformity of her child but accurate information and education may lead to reduced stress level and increased the well-being level of mother (Tassadaq et al., 2016). Conservative treatment was performed by Hippocrates in 400 BC which was manipulations followed by immobilization (Evans, Perveen, Ford-Powell, & Barker, 2014).

In the English literature suggested that Ponseti method in the low- and middle-income countries is very successful and it is relatively simple and highly cost-effective treatment. Ponseti recommended that the ideal start of the Ponseti treatment is as early as possible with exception of premature babies as well as when treatment is delayed, more difficult to correct the deformity. If untreated at all, it causes the child to grow up with a disability that has problems with societal stigma, severely painful, decreased mobility (Wijck, Oomen, & Heide, 2015).

The Ponseti method is divided into corrective phase which involves manipulation followed by casting and the maintenance phase by a brace to prevent recurrence of club foot. Foot abduction brace is used twenty three hours a day for the first 3 months and then twelve hours until five years of age (Hargava et al., 2013).

Over 95 % of the cases are completely functional and pain-free which was treated by Ponseti method and most of the studies reported that Ponseti method was successful treatment for clubfoot (Radler, 2013).

Worldwide non-invasive acceptance Ponseti method (PM) has been developed over the past decade which method was first introduced around 1940s by Dr. Ignatio Ponseti from the University of Iowa (Mbonye, & Amone, 2009).

Ponseti method involved manipulation, casting and percutaneous tenotomy to release the tendon of Achilles (Selmani, 2012). Different study showed that Ponseti method can achieve correction of the clubfoot deformity with excellent results (Morcuende, Dolan, Dietz, & Ponseti, 2004).

One of the studies conducted at the Walk for Life Ponseti clinic in Mymensingh Medical College Hospital (MMCH). The study period was from February 2011 to December 2014. Ponseti method was provided by the orthopaedic

surgeon and physiotherapist. In this study, 577 children with club foot included for this research to WFL clinic MMCH from 2011 to 2014. 175 patients (30.32%) were female and 402 (69.7%) were male. Male and female ratio was 2.29:1.

Ponseti method is very effective treatment for treating children with club foot which includes manipulation and casting by well-trained staff (Dietz, 2002). Ponseti method is gold standard treatment for club foot and PM has been well circulated all over the world, especially in the developing countries (Zeno & Sorin, 2014).

In Uganda Ponseti technique introduced by Pirani in 1999 and also introduced in Canada with good treatment outcomes; Uganda Clubfoot Project which is funded by Rotary combined by Pirani, Norgrove, collaboration with the Disability Section of the Ministry of Health, the Department of Orthopaedics Makerere University and the Child's Orthopaedic Rehabilitation project established for treating clubfoot. Trained both local surgeons and other medical care professionals including orthopaedic clinical officers and physiotherapists by this project on Ponseti technique and built awareness about club foot treatment (Konde-Lule et al 2005).

Ponseti method is divided into two phases in Uganda for treating children with club foot. Deformity is corrected by plaster casting and tenotomy which is treatment phase or first phase and maintenance phase or second phase by foot abduction brace for preventing recurrence of the clubfoot deformity. The treatment phase includes manipulation & casting where is done weekly 5-6 cast (Judd, 2004).

According to Ponseti (1997), Children need to wear the braces in maintain phase for 23 hours out of 24 hours for the first 3 months and at night and nap times only for further 2 years. Although basically conservative method safer than surgery but there is a chance develop some complications such as pressure sores, fractures if excessive pressure is used during cast application; rocker-bottom deformity (Ponseti, 1997).

2.7.2. Surgical treatment

According to Khan and Chinoy (2006) have reported that correction by surgery is the only option to gain a functional foot in conditions when non-surgical treatment fail by late treatment, received inadequate treatment or did not complete the plaster cast.

Non-surgical treatment is the first choice due to early detection in developed countries which is argued as well as in developing countries patients remains untreated months or even years after birth for using of non-surgical interventions ineffective (Khan & Chinoy, 2006).The purpose of surgical treatment is to restore as normal a structure and function of the foot as much as possible (Richard et al, 2002). Posterior release as well as posterolateral and posteromedial releases are commonly used for the correction of clubfoot (Hoque, Uddin, & Sultana, 2001).Surgical treatment for children with clubfoot are associated with other problems like wound infections, fibrosis, severe scar formation, stiffness of joints, weakness of the plantar flexors of the ankle, pain in the corrected foot, or relapses for these need of additional surgery (Ponseti, 1997).

Retrospective review and prospective studies reported that the effect of club foot treatment by Posterior Medial Release (PMR) surgical method was poor outcomes with pain and function. On the other hand Ponseti method has been extensively investigated and got the best clinical outcomes as well as more cost-effective, when compared to surgery procedure. 99% of children with clubfoot were walking independently two years after treatment by Ponseti method (Rahman, et al., 2018).

This study was designed to evaluate the effects of educational booklet among children with clubfoot during bracing stage of treatment by Ponseti method for identifying the effectiveness of educational booklet on status of clubfoot by Pirani scoring system and also revealed socio-demographic information by structured questionnaire.

3.1. Study Design:

This study was a quantitative type quasi-experimental research design. Actually, it was an experiment among specific groups and usual groups. Exercises applied with educational booklet to the booklet group or experiment group and only usual exercises applied to the non-booklet group or the control group. A pre-test (before exercises provided by educational booklet) and post-test (after exercises provided by educational booklet) as well as a pre-test (before usual exercises provided by verbal instruction) and post-test (after usual exercises provided by verbal instruction) was administered with each subject of both groups to compare the effects on children with club foot during bracing stage of treatment by Ponseti methods.

3.2. Study Area:

The study was carried out at Walk for Life (The national club foot program of Bangladesh) and Centre for the Rehabilitation of the Paralysed (CRP)-Savar, Dhaka.

3.3. Study period:

From September, 2018 to May, 2019.

3.4. Study Population:

The study was conducted among children with clubfoot and caregivers (Father, mother, other caregiver) who was attended at Walk for Life Ponseti clinic of Centre for the Rehabilitation of the Paralysed (CRP)-Mirpur, Bangabandhu Sheikh Mujib Medical University (BSMMU), Institute of Child and Mother Health (ICMH), Rajshahi Medical College Hospital, Barishal Medical college Hospital, Bhola Sadar Hospital, Patuakhali Sadar Hospital, Khulna Medical College Hospital, Bagerhat Sadar Hospital, Satkhira Sadar Hospital as well as Centre for the Rehabilitation of the

Paralysed (CRP)--Savar Ponseti clinic. Both male and female caregivers (Father, mother, other caregiver) were recruited for interview in this study.

3.5. Sample size:

Sample size was 360 for this study. Among them 175 participants were in experiment group or booklet group and 185 participants in control group or non-booklet group.

3.6. Sampling Technique:

Sampling technique was a convenient sampling technique. Data were collected by face to face interview and average 15-20 minutes were spent for each of the participants. A structured questionnaire (25 questions) in Bangla which related to socio-demographic information and children with clubfoot was used for data collection as well as Pirani scoring system where 6 components was used for detecting the severity of club foot.

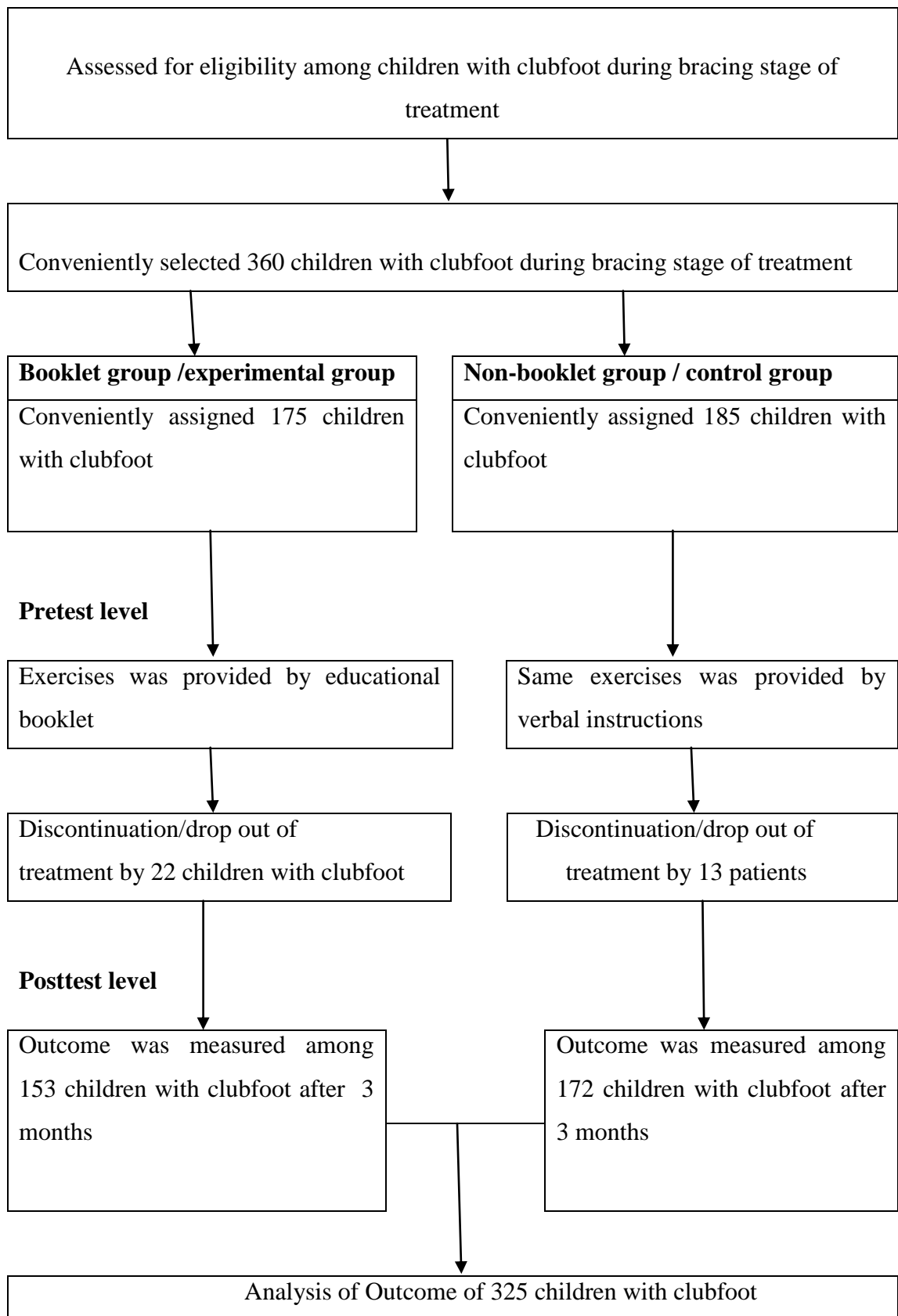


Figure 2:Flow-chart of the phases of Quasi-experimental research

3.7. Inclusion Criteria:

The following were included in the study:

- Parents or caregivers of children with a clinical diagnosis of idiopathic unilateral or bilateral clubfoot (Malagelada, Mayet, Firth, & Ramachandran, 2016).
- Caregivers who were able to fill in the questionnaires of this study (Malagelada, et al., 2016).
- Bracing stage of Ponseti treatment at the time of the study who wore foot abduction brace (Malagelada, et al., 2016).

3.8. Exclusion Criteria:

The following were excluded from the study:

- All the children whose caregivers refused consent (Malagelada, et al., 2016).
- Children with clubfoot who had other surgical treatment in spine and lower limbs.
- All the children who has already relapsed and need further surgery (Malagelada, et al., 2016).
- All children with clubfoot who had associated neurological disorders like cerebral palsy, myelomeningocele, arthrogryposis multiplex congenita or other associated lower limb disorders (Malagelada, et al., 2016).
- Children with only forefoot deformity like metatarsus adductus.

3.9. Data Collection methods and instruments:

This study was included 360 data from different Ponseti clinics in Bangladesh where most of the Ponseti clinics included from Walk for Life and also one Ponseti clinic included from CRP, Savar, Dhaka. For booklet group included 175 data where Centre for the Rehabilitation of the Paralysed (CRP)-Mirpur were 10, Bangabandhu Sheikh Mujib Medical University (BSMMU) were 7, Institute of Child and Mother Health (ICMH) were 18, Rajshahi Medical College Hospital were 29, Barishal Medical college Hospital were 12, Bhola Sadar Hospital were 6, Patuakhali Sadar Hospital were 9, Khulna Medical College Hospital were 38, Bagerhat Sadar Hospital were 13,

Satkhira Sadar Hospital were 18 as well as Centre for the Rehabilitation of the Paralyzed (CRP)--Savar Ponseti clinic were 15.

On the other hand for non-booklet group included 185 data where Centre for the Rehabilitation of the Paralyzed (CRP)-Mirpur were 10, Bangabandhu Sheikh Mujib Medical University (BSMMU) were 8, Institute of Child and Mother Health (ICMH) were 17, Rajshahi Medical College Hospital were 31, Barishal Medical college Hospital were 20, Bhola Sadar Hospital were 11, Patuakhali Sadar Hospital were 9, Khulna Medical College Hospital were 37, Bagerhat Sadar Hospital were 13, Satkhira Sadar Hospital were 9 as well as Centre for the Rehabilitation of the Paralyzed (CRP)-Savar Ponseti clinic were 20.

Data collection procedure was involved face to face interview by interviewer administered by structured questionnaire for obtaining socio-demographic information and clubfoot related information. Pirani scoring system was used for detecting the status of clubfoot by experienced physiotherapists cum Ponseti practitioner. Data was collected from ten Walk for Life Ponseti clinics in Bangladesh by physiotherapists cum Ponseti practitioner and also collected from CRP, Savar (Dhaka) by one speech and language therapy student with the help of one Physiotherapist cum Ponseti Practitioner.

3.10. Data analysis methods:

Data was checked and rechecked thoroughly and meticulously. Missing data was checked from the data collection sheet and excluded from study. Collected data was entering into the computer. The analysis was done by using SPSS-20 software. Data was analyzed by using descriptive statistics (Frequency, percentage, means, median, mode, and standard deviation), Compare t-test (paired sample t-test for test of significance) among children's Pirani score before providing educational booklet & children's Pirani score after providing educational booklet as well as children's Pirani score before providing no educational booklet & children's Pirani score after providing no educational booklet.

3.11. Level of Significance:

The “p” value is calculated for determining significance of the study. The p value means probability which refers to the accuracy of the findings of the study. If the p value is less than 0.05, the result is significant for health research (DePoy & Gitlin, 2015).

3.12. Ethical Considerations:

The whole process of this study was done by following the Bangladesh Medical Research Council (BMRC) guidelines and World Health Organization (WHO) Research guidelines. The proposal of the thesis including methodology was presented to the Institutional Review Board (IRB) of Bangladesh Health Professions Institute (BHPI) (Appendix-A). After that started data collection at Ponseti clinic CRP-Savar, researcher obtained permission (Appendix-B) from Head of the department of physiotherapy of the Centre for the Rehabilitation of the Paralysed for data collection as well as permission was obtained from authority of Walk for Life for data collection in walk for life Ponseti clinics in Bangladesh. The privacy and confidentiality were strictly maintained during data collection by the researcher. Before data collection objectives of the study was informed to the caregivers in the study. Written informed consent was taken from each participant to take part in this study (Appendix-C) as well as Right to withdraw from the study at any time was ensured.

3.13. Exercises protocol:

There were five physiotherapists who were expert in treatment of children with club foot as a Ponseti practitioner for providing exercises in different Ponseti clinic in Bangladesh. All the physiotherapists have well experience about clubfoot treatment of more than three years in the aspect as a Ponseti practitioner. All physiotherapists were male. At first, there were 13 exercises for a pilot study in both groups (Booklet group, non-booklet) group but faced some problem to perform exercises properly. After that consulted with some expert physiotherapist for excluding some exercises which was difficult to perform. Pilot study included exercises-1. Active assisted exercises 2. Active exercises, 3. Sit to stand practice, 4. Squatting, 5. Toe walking, 6. Single leg standing, 7. Standing on heels, 8. Gait training, 9. Resistance exercises, 10. Active calf muscles stretching, 11. Passive calf muscles stretching, 12. Ramp stretching13.

Balancing exercises for both groups. Finally, there were 11 exercises selected from expert opinion for both groups in this study. Experts were mainly physiotherapists for selecting exercises from CRP and Walk for Life, Bangladesh.

The final exercise protocols for both groups were - 1. Passive calf muscles stretching, 2. Peroneal exercise, 3.Active exercises, 4.Bridging, 5.Sit to stand practice, 6.Squatting, 7.Gait training, 8.Toe walking, 9.Standing on heels, 10.Single leg standing, 11.Ramp stretching. All the exercises were provided in experimental group with an educational booklet where described exercises instruction with pictures. On the other hand, same exercises were provided in control group with verbal instruction. Frequency of exercises, intensity of exercises, types of exercise and time of exercises were advised properly for booklet group as well as verbally advised for non-booklet (Appendix-D).

This chapter represents the results of this study. The results includes the socio-demographic characteristics of the parents, family history of clubfoot, sex of clubfoot baby, siblings, affected feet, duration of bracing time, problem during bracing Pirani score of children with clubfoot.

4.1. Socio-demographic findings

This study purposed to identify baseline characteristics of children with clubfoot in Bangladesh. This section presents information on clubfoot children age, the parent's age and other caregiver age, occupational status of parents, and educational level of parents and other caregiver.

A total 360 children with clubfoot were recruited in this study. The children's ages ranged from 2 months days to 84 months. Clubfoot children mean age was 21.54 months and the mode was 36 months, SD was 17.374.

The mother's ages ranged from 16 years to 45 years. Mean age of mothers were 25.03 years and the mode was 25 years, SD was 4.803. The father's ages ranged from 18 years to 52 years. Mean age of fathers were 31.89 years and the mode was 30 years, SD was 5.834. There were other caregivers 11 out of 360. The other caregiver's ages ranged from 18 years to 66 years. Mean age of other caregivers were 44.09 years, and the mode was 40 years, SD was 15.195.

4.2. Age of children, mother, father and other caregiver of clubfoot

Age	Mean \pm SD
Age of children with clubfoot (In months)	21.54 \pm 17.374
Age of mother (In years)	25.03 \pm 4.803
Age of father (In years)	31.89 \pm 5.834
Age of other caregiver (In years)	44.09 \pm 15.195

Table-1 showed that Mean \pm SD of age of children with clubfoot, age of mother, age of father and age of other caregiver.

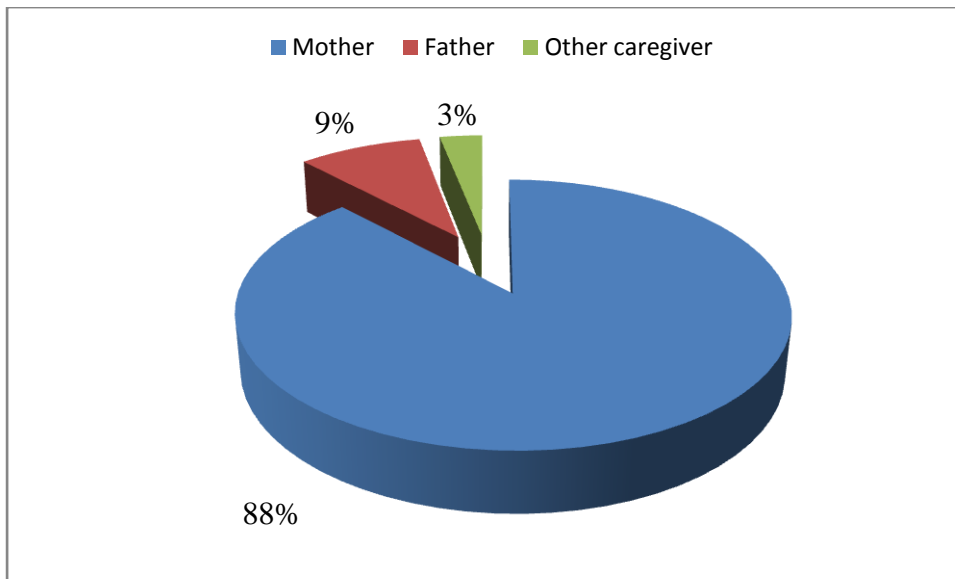


Figure-3: showed that 88.06% of caregivers were mother (n=317), 8.89% were father (n=32), 3.06% were other caregiver (n=11).

4.4. Education level of mothers (n=360)

Education level	Frequency (n)	Percentage (%)
No institutional education	18	5
Primary (I-V)	144	40
Secondary (VI-SSC)	119	33.1
Higher Secondary (XI-HSC)	39	10.8
Honors	22	6.1
Masters	18	5
Total	360	100

Table-2 showed that educations of the total mothers, most of 40% were Primary level education. The mothers that participated in this study came from different educational backgrounds. 5% of mothers (n=18) had no institutional education; 33.1% of mothers (n=119) had secondary level education (VI-SSC), 10.8% of mothers (n=39) had higher secondary level (XI-HSC) education, 6.1% of mothers (n=22) had honors level education and 5% of mothers (n=18) had masters level education.

4.5. Education level of fathers (n=360)

Education	Frequency (n)	Percentage (%)
No institutional education	53	14.7
Primary	119	33.1
Secondary	81	22.5
Higher Secondary	48	13.3
Honors	29	8.1
Masters	30	8.3
Total	360	100

Table-3: showed that education among fathers most of 33.1% were Primary level education. 14.7% of fathers (n=53) had no institutional education; 33.1% of fathers (n=119) had primary level (I-V) education; 22.5% of fathers (n=81) had secondary level education (VI-SSC), 13.3% of fathers (n=48) had higher secondary level (XI-HSC) education, 8.1% of fathers (n=29) had honors level education and 8.3% of fathers (n=30) had masters level education

4.6. Education level of other caregiver (n=11)

Education level	Frequency (n)	Percentage (%)
No institutional education	2	18.2
Primary (i-v)	4	36.4
Secondary (vi-SSC)	3	27.2
Higher Secondary (xi-HSC)	1	9.1
Honors	1	9.1
Total	11	100

Table-4 showed that education of the other caregiver, 18.2% were no institutional education, 36.4% were Primary.

4.7. Occupational status of mothers (n=360)

Occupation	Frequency (n)	Percentage (%)
Housewife	334	92.7
Service holder	23	6.4
Day labor	1	0.3
Other	2	0.6
Total	360	100

Table-5 showed that mostly ninety-three percent of mothers (n=334) were housewife as well as only 6.4% of mothers (n=23) were service holder, 0.3% of mothers (n=1) were day labor and other occupation of mothers (n=2) were 0.6%.

4.8. Occupational status of fathers (n=360)

Occupation	Frequency (n)	Percentage (%)
Unemployed	5	1.4
Farmer	50	13.9
Service holder	107	29.7
Business	66	18.3
Day labor	76	21.1
Other	56	15.6
Total	360	100

Table-6 showed that about thirty percent of fathers (n=107) were service holder. Only 1.4% of fathers (n=5) were Unemployed, 13.9% of fathers (n=50) were farmer, 18.3% of fathers (n=66) who were business man, 21.1% of fathers (n=76) who were day labor and 15.6% of fathers (n=56) who were other different occupation.

4.9. Family income of the participants (n=360)

Family income	Frequency	Percent
Below 10000 BDT	90	25
10000 – 20000 BDT	205	56.9
20001-30000 BDT	30	8.3
30001-40000 BDT	13	3.6
40001-50000 BDT	17	4.7
Above 50000 BDT	5	1.4
Total	360	100

Table-7 showed that among the participants of the family income 25% was below 10000 BDT, 56.9% was 10000-20000 BDT, 8.3% was 20001-30000 BDT, 3.6% was 30001-40000 BDT, 4.7% was 40001-50000 BDT and 1.4% was above 50000 BDT.

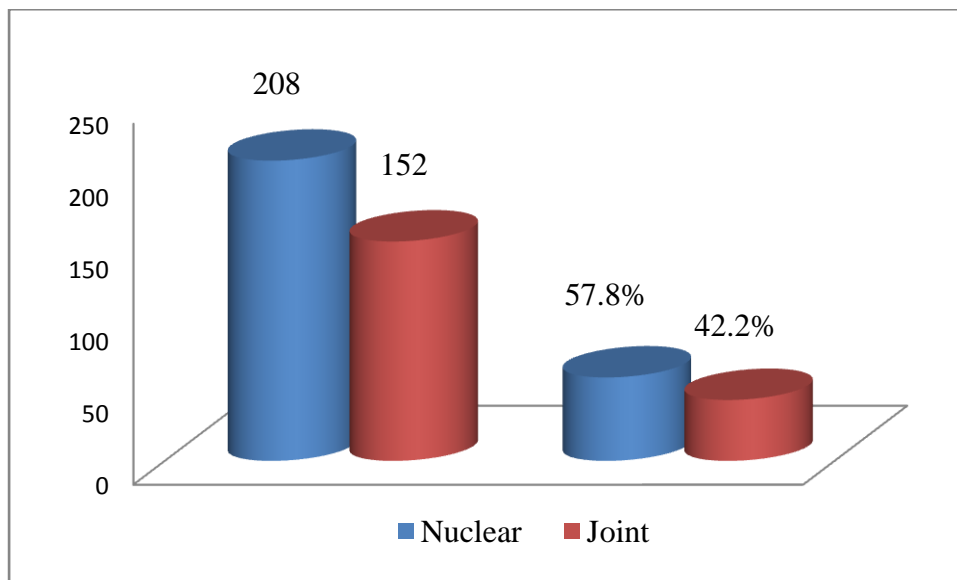


Figure-4: shows that among the participants 57.8 % were of nuclear family.

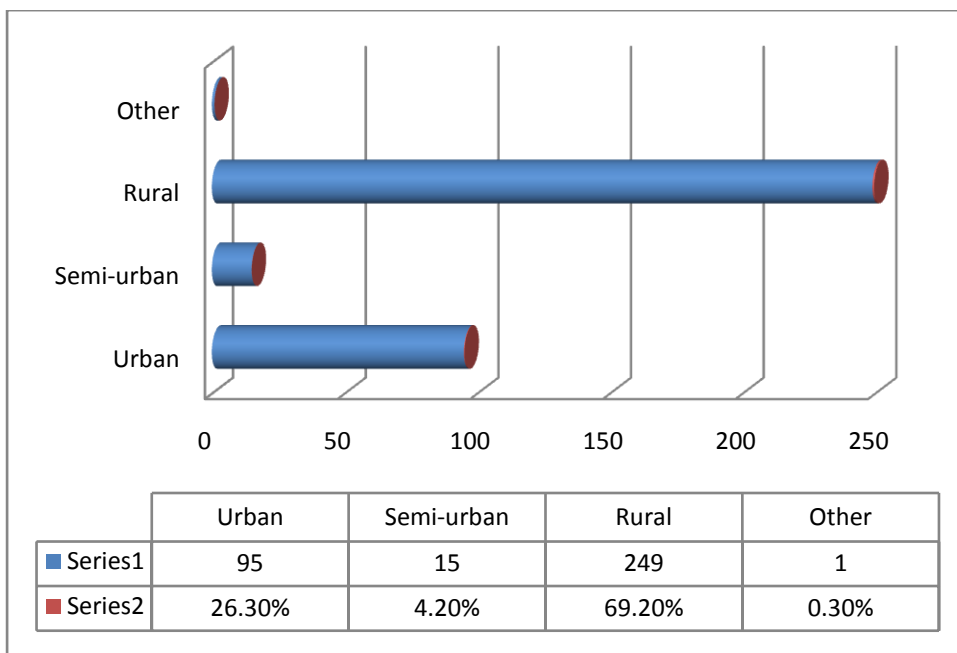


Figure-5: showed that among 69.20% were living in rural area.

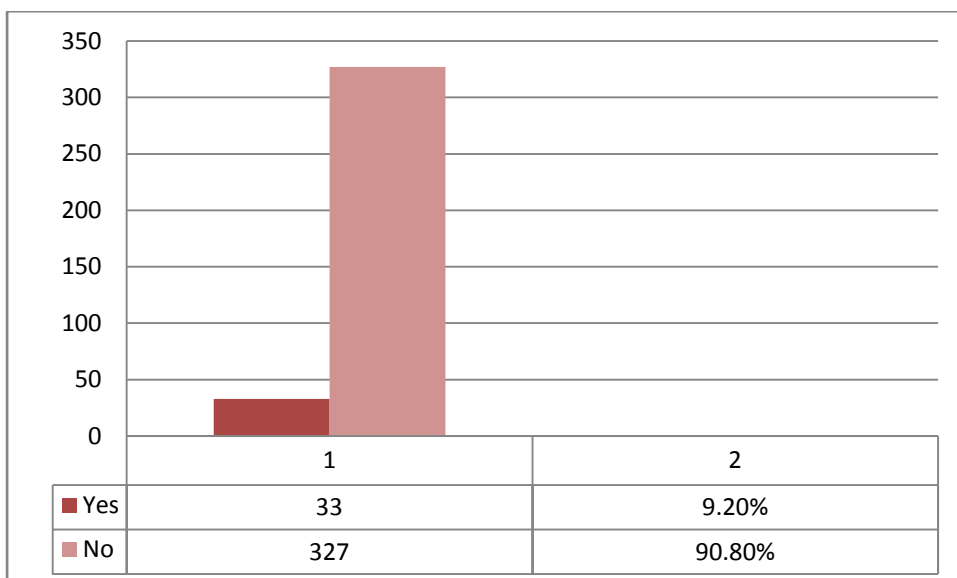


Figure-6: showed that family history of clubfoot baby where, Yes only 9.2%.

4.13. Distribution of family history who had clubfoot (n= 30)

	Frequency	Percent
Father	5	16.7
Mother	6	20
Brother	3	10
Sister	4	13.3
Grandfather	3	10
Other	9	30
Total	30	100

Table-8 showed family history that had clubfoot, where other relative had 30%.

4.14. Participants by the sex of clubfoot baby (n=360).

Sex of baby	Frequency	Percent
Male	261	72.5
Female	99	27.5
Total	360	100

Table-9 showed that among the participants 72.5% had male clubfoot baby.

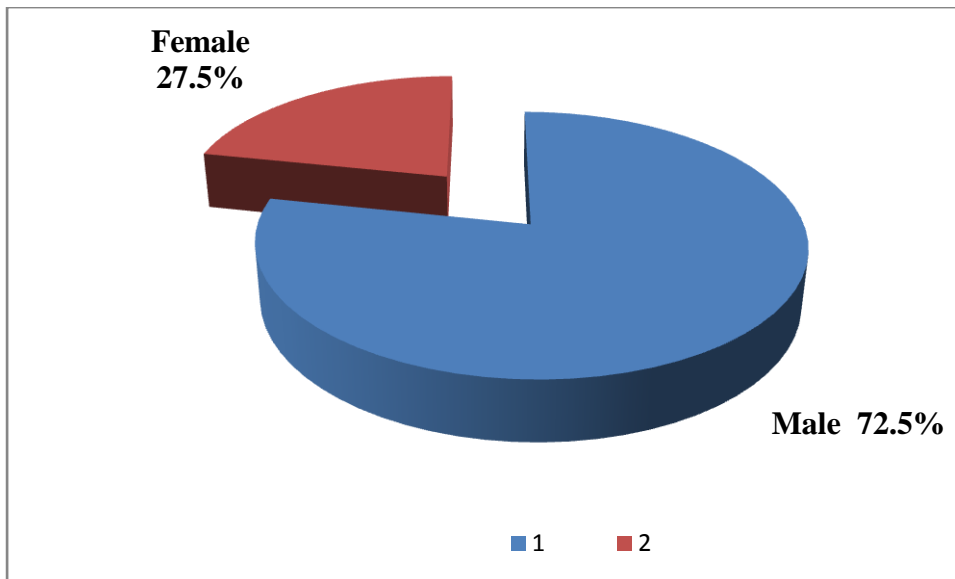


Figure-6: showed that among the participants 72.5% had male clubfoot baby.

4.15 Distribution of the clubfoot babies by siblings (n= 360).

Siblings	Frequency	Percent
First	188	52.2
Second	117	32.5
Third	47	13.1
Fourth	7	1.9
Fifth	1	0.3
Total	360	100

Table-10 showed that the clubfoot babies by siblings where first baby were 52.2%.

4.16 Caregivers who were familiar with children with clubfoot (n= 360).

Familiar	Frequency	Percent
Yes	23	6.4
No	337	93.6
Total	360	100

Table-11 showed that among caregivers familiar with clubfoot baby where, yes only 6.4%.

4.17 Distribution of the children by facing problem with wearing brace (n=360).

Problem	Frequency	Percent
Yes	81	22.5
No	279	77.5
Total	360	100

Table-12 showed that participants who had problem face with brace wears by children with clubfoot, yes only 22.5%.

4.18 Distribution of participants what type problem face with brace wears by children with clubfoot during bracing stage of clubfoot treatment (n=81)

Type of problem	Frequency	Percent
Pain	5	6.2
Swelling	5	6.2
No cause	54	66.7
Other	17	21
Total	81	100

Table-13 showed that participant's type of problem face with brace wears by children with clubfoot during bracing stage of clubfoot treatment, where unknown cause was 66.7%.

4.19: Distribution of clubfoot babies by affected feet (n=360)

Affected feet	Frequency	Percent
Unilateral	162	45
Bilateral	198	55
Total	360	100

Table-14 showed that among the clubfoot babies, 45 % of clubfoot babies had unilateral.

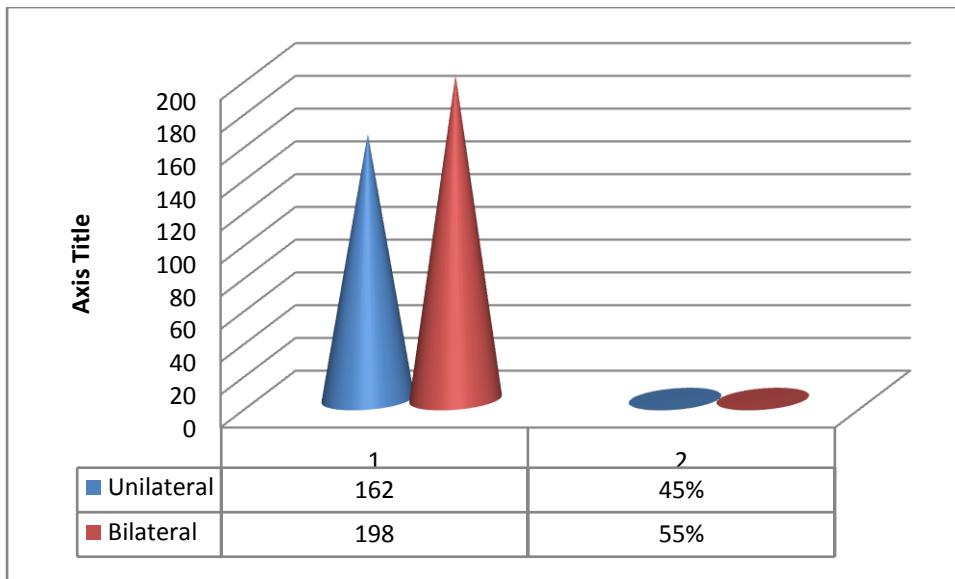


Figure-8: showed that among the clubfoot babies, 45 % of clubfoot babies had unilateral.

4.20 Distribution of Pirani score among clubfoot babies for right feet (n=304)

Mean \pm SD of Pirani score for right feet were $.52 \pm .2529$

Pirani score	Frequency	Percent
0	26	8.6
.5	244	80.3
.10	32	10.5
.15	1	0.3
.25	1	0.3
Total	304	100

Table-15 showed that 80.3% of child with clubfoot for right feet Pirani score were .5.

4.21 Distribution of Pirani score among clubfoot babies for left feet (n=256)

Mean \pm SD of Pirani score for left feet were $.525 \pm .2626$

Pirani score	Frequency	Percent
0	22	8.6
.5	203	79.3
.10	29	11.3
.15	1	0.4
.25	1	0.4
Total	256	100

Table-16 showed that 79.3% of child with clubfoot for left feet Pirani score were .5.

4.22 Paired sample T-test

Paired Samples Statistics

Groups	Mean	Std. Deviation	Std. Error Mean
Pre-test Pirani score for right foot (Booklet group, n = 128)	.56	.33	.0295
Post-test Pirani score for right foot (Booklet group, n = 128)	.43	.41	.0363
Pre-test Pirani score for left foot (Booklet group, n = 111)	.53	.33	.0309
Post-test Pirani score for left foot (Booklet group, n = 111)	.44	.64	.0603
Pre-test Pirani score for right foot (Non-booklet group, n = 135)	.496	.13	.0111
Post-test Pirani score for right foot (Non-booklet group, n = 135)	.54	.53	.0454
Pre-test Pirani score for left foot (Non-booklet group, n = 118)	.5	.15	.0135
Post-test Pirani score for left foot (Non-booklet group, n = 118)	.53	.48	.0446

Table-17 showed that Pre-test Pirani mean score and Post-test Pirani mean score among children with clubfoot in booklet as well as non-booklet group.

Paired Samples Correlations

Groups	Correlation	Sig.
Pre-test Pirani score for right foot (Booklet group, n = 128)	.02	.0023
Post-test Pirani score for right foot (Booklet group, n = 128)		
Pre-test Pirani score for left foot (Booklet group, n = 111)	.014	.0140
Post-test Pirani score for left foot (Booklet group, n = 111)		
Pre-test Pirani score for right foot (Non-booklet group, n = 135)	.011	.0197
Post-test Pirani score for right foot (Non-booklet group, n = 135)		
Pre-test Pirani score for left foot (Non-booklet group, n = 118)	.0272	.0003
Post-test Pirani score for left foot (Non-booklet group, n = 118)		

Table-18 showed that correlation & significant level between Pre-test Pirani score and Post-test Pirani score among children with clubfoot in booklet as well as non-booklet group.

Table:21**Paired Samples Test**

	Paired differences				t	Sig. (2-tailed)
	Mean	Std. Dev.	95% Confidence Interval of the Difference			
			Lower	Upper		
Pre-test Pirani score for right foot (Booklet group) Post-test Pirani score for right foot (Booklet group)	.125	.47	.0421	.21	.299	.0003
Pre-test Pirani score for left foot (Booklet group) Post-test Pirani score for left foot (Booklet group)	.090	.67	-.0362	.22	.14	.016
Pre-test Pirani score for right foot (Non-booklet group) Post-test Pirani score for right foot (Non-booklet group)	-.048	.53	-.14	.042	-.11	.029
Pre-test Pirani score for left foot (Non-booklet group) Post-test Pirani score for left foot (Non-booklet group)	-.025	.47	-.11	.059	-.059	.056

The mean Pirani score before providing exercises with educational booklet for right feet among the clubfoot babies were 0.56 ± 0.33 (Booklet group) and after providing exercises with educational booklet for right feet among the clubfoot babies were 0.43 ± 0.41 (Booklet group)). Statistically it was found highly significant ($t= 2.99, p < 0.0003$). So it was concluded that exercises with educational booklet had significant influence on Pirani score reduction for right feet among the clubfoot babies.

The mean Pirani score before providing exercises with educational booklet for left feet among the clubfoot babies were 0.53 ± 0.33 (Booklet group) and after providing exercises with educational booklet for left feet among the clubfoot babies were 0.44 ± 0.64 (Booklet group)). Statistically it was found highly significant ($t= 0.14, p < 0.016$). So it was concluded that exercises with educational booklet had significant influence on Pirani score reduction for left feet among the clubfoot babies.

The mean Pirani score before providing usual exercises for right feet among the clubfoot babies were 0.496 ± 0.13 (Non-booklet group) and after providing usual exercises for right feet among the clubfoot babies were 0.54 ± 0.53 (Non-booklet group)). Statistically it was found significant ($t= - 0.11, p < 0.029$). So it was concluded that usual exercises without educational booklet had influence on Pirani score increased for right feet among the clubfoot babies.

The mean Pirani score before providing usual exercises for left feet among the clubfoot babies were 0.5 ± 0.15 (Non-booklet group) and after providing usual exercises for left feet among the clubfoot babies were 0.53 ± 0.48 (Non-booklet group)). Statistically it was found significant ($t= - 0.059, p < 0.056$). So it was concluded that usual exercises without educational booklet had influence on Pirani score increased for left feet among the clubfoot babies.

This study focused on exercises during bracing stage of clubfoot treatment by Ponseti method with educational booklet for preventing recurrence of children with clubfoot. This study was a quasi-experimental study due to lack of randomization to see the effects of educational booklet among children with clubfoot during bracing stage of clubfoot treatment by Ponseti method. This study also described about a snapshot of socio-demographic information of caregivers of children with clubfoot who attended at different Ponseti clinics in Bangladesh. The socio-demographic information exposed that age, education, occupation, income of caregivers as well as sex, family history, affected feet, starting age of treatment, Pirani score, and problem during wear brace of children with clubfoot.

Clubfoot is the second most common birth defect of the lower limb (Cummings, Davidson, Armstrong, & Lehman, 2002). CTEV is a serious health issue in the developing countries because of later observation, higher dropout from the treatment of clubfoot as well as beliefs that it is congenital illness (Pulak & Swamy, 2012). Clubfoot is a common orthopedic problem in Bangladesh comparable to globally. Children with clubfoot intervention should be started as early as possible for better outcome (Pulak & Swamy, 2012). It should be started treatment as early as one week after birth when the biological response bone is best and can gradually reduce or almost eliminate the deformities in most clubfeet.

In Bangladesh, Physiotherapists are heavily involved for clubfoot treatment in clubfoot clinics. There are 32 Ponseti clubfoot clinics at Walk for life is a project of the Glencoe Foundation as The National Clubfoot Program of Bangladesh in whole country except Chattogram division. Chattogram division are covered clubfoot treatment by Zero clubfoot mostly as well as CRP also providing clubfoot treatment in Bangladesh. All the Ponseti clubfoot clinics in Bangladesh like Walk for life, Zero clubfoot and CRP Ponseti clubfoot clinic are conducted by Physiotherapists as a Ponseti practitioner under the supervision of orthopedic surgeons where physiotherapists provide assessment, diagnosis, manipulation and casting as well as maintain follow up. One of the studies conducted in Harare that established clubfoot clinics are run mainly by physiotherapists as well as combined with occupational

therapists and rehabilitation technicians (Munambah, Chiwaridzo, & Mapingure, 2016). Orthopaedic clinical officers are mainly involved in Malawi for conducting clubfoot clinics (Tindall, Steinlechner, Lavy, Mannion, & Mkandawire, 2005) as well as physiotherapists are also mostly involved in South Africa for clubfoot treatments (Khan, 2005). Physiotherapists, occupational therapists and rehabilitation technicians working combined in clubfoot clinics (Munambah et al., 2016).

Clubfoot is congenital deformity of foot and there is chance to recurrence. One study reported that 20 years of practice, relapses occurred in estimated half of the children with club foot from ten months to five years, averaging two-and-one-half years; basically relapses were observed on 2-4 months after discarded brace (Ponseti, 2002).

This study indicated that education was very important factors for maintaining follow-up up to five years of age with proper direction. Some of parents could not understand educational booklet instruction properly. For that reason they could not perform exercises according to instruction of educational booklet. It is suggested that caregivers should be educated about clubfoot treatment procedure, if they want to get better expected outcome so that they can understand about the treatment and maintenance process (Pirani et al., 2009). It was same suggestion by other study that the medical rehabilitation professionals which caregiver understanding of the children with clubfoot and Ponseti methods can improve all the stage clubfoot treatment as well as awareness can improve the success of the Ponseti method and decrease the risk of relapses (Munambah et al., 2016). In Bangladesh, there are different levels of education. Most of the mothers that participated in this study came from different educational background specially 40% of mothers (n=144) had primary level (I-V) of education as well as 33.1% of mothers had secondary level of education (VI-SSC). The fathers that participated in this study came from also different educational backgrounds such as 14.7% of fathers had no institutional education, 33.1% of fathers (n=119) had primary level (I-V) education, 22.5% of fathers had secondary level education (VI-SSC), 13.3% of fathers had higher secondary level (XI-HSC) education, 8.1% of fathers had honors level education and 8.3% of fathers had masters level education. On the other hand, education of the other caregiver 18.2% were no institutional education and 36.4% were Primary.

Previous study found that treatment started at a younger age and had better out-comes (Goksan, Bilgili, Eren, Bursalı, & Koc, 2015). Our clinical experience showed that missed appointments, not attending to broken casts, and poor brace use are common contributing factors for incomplete clubfoot correction and developed frustration due to long term treatment process (Goksan et al., 2015).

A total 360 children with clubfoot were recruited in this study. The children's ages ranged from 2 months days to 84 months. Clubfoot children mean age was 21.54 months as well as SD was 17.374. The mother's ages ranged from 16 years to 45 years. Mean age of mothers were 25.03 years and SD was 4.803. The father's ages ranged from 18 years to 52 years. Mean age of fathers were 31.89 years and SD was 5.834. There were other caregivers 11 out of 360. The other caregiver's ages ranged from 18 years to 66 years. Mean age of other caregivers were 44.09 years SD was 15.195. The previous study reported that mean age of the caregivers were 31.10 years and SD = 6.22 where 62.1% between 26 and 35 years of age (Esan et al., 2017).

The role of caregivers is the key component for maintaining the whole treatment protocol among children with clubfoot. This study reported that 88.06% of caregivers were mother, 8.89% were father as well as only 3.06% were other caregiver. Mostly ninety-three percent of mothers were housewife as well as only 6.4% of mothers (n=23) were service holder. On the contrary, thirty percent of fathers were service holder, 13.9% of fathers were farmer and 21.1% of fathers were day labor.

Family income also vital component to continue long term treatment procedure for preventing recurrence of club foot. In this study reported that among the participants of the family income 25% was below 10000 BDT, 56.9% was 10000-20000 BDT, 8.3% was 20001-30000 BDT, 3.6% was 30001-40000 BDT, 4.7% was 40001-50000 BDT and only 1.4% was above 50000 BDT. Social data showed that majority of the families in one cohort were below the 50th percentile for household income or deprivation (92 % in the UK and 75 % in SA) and other that the observed low income and higher deprivation may play a role in the level of stress and coping strategies used by families, although we could not prove this in our study (Malagelada et al., 2016). Evidenced supported that significant etiology of failure to complete treatment in Madagascar due to financial burden on families and many of them were very poor (Ramahenina, O'connor, & Chamberlain, 2016).

Many of the families lived in very rural places that were not accessible to receive treatment in the rainy season (Ramahenina et al., 2016). In this study included mostly 69.20% of participants were living in rural area which was very challenging to attend the clinics for receiving treatment. The participants who attended in this study 57.8 % were of nuclear family. One of the other study reported that less than 10 % has a family history of clubfeet which was comparable to previous findings (Ford-Powell et al., 2013). In this study explored that positive family history of clubfoot was 9.2% which was also less than 10% and 55 % of clubfoot babies had bilateral. Demographic expectations and most children were boys with bilateral clubfeet according to previous study (Perveen et. al., 2014).

In our study, male to female ratio was 1.5:1 which compared to other similar studies ranges from 2.33:1 to 2.5:1 in the world (Turco, 1979). Some of indian studies showed that the ratio ranges from 2:1 to as 4:1(Yamamoto, 1979). Prevalence of affected feet which included 44% bilaterally, 24% for right feet and 32% for left feet Kite, 1939).

One of the study included 96 participant for study where male was 64 and female was 32 children with clubfoot that means Male to Female ratio was 2:1 (Shivakumar, Afzal., & Chaitanya, 2016). Male-to-female ratio had 3:1 (Yamamoto, 1979) and 53 (58.8%) had bilateral involvement conducted by other research (Pavone, Testa, Alberghina, Lucenti, & Sessa, 2015). Bilaterality observed in 49.2%, but also reported by another study only 35% bilateral cases (Shivakumar et al., 2016). This study showed that participants 72.5% had male clubfoot baby had been included in this study. Caregivers of children with club foot who familiar with clubfoot baby were only 6.4%.

One study indicated that caregivers had poor knowledge about children with clubfoot and its treatment primarily but gathered knowledge by successive attendance to the treatment of their children as well as this study found that approximately 50% of the caregivers have lack of knowledge on using brace (Alam et al., 2015). The present study also reported that problem faced during brace wearing by children with clubfoot, it was 22.5% as well as also indicated type of problem face with brace wears by children with clubfoot during bracing stage of club foot treatment, where unknown cause was 66.7%.

This study presented that during first assessment 80.3% of child with club foot during bracing stage of club foot treatment by Ponseti method for right feet mean Pirani score were 0.5 as well as 79.3% of child with clubfoot during bracing stage of club foot treatment by Ponseti method for left feet mean Pirani score were 0.5. On the other hand other study reported that average primary mean Pirani score was 5.546 where lower value was 4.5 and upper value was 6 point (Pavone, Testa, Alberghina, Lucenti, & Sessa, 2015). According to Pavone et al. (2015) relapse rate had only 3.9% after the correction of children with club foot deformity, other study supported that relapse rate had 5% (Pulak et al., 2012). Post operative mean Pirani score was 0.32 which showed excellent result among children with clubfoot (Pavone et al., 2015).

Ponseti method was an excellent treatment protocol among children with clubfoot which could avoids the complications of major surgery for getting painless, mobile, normal-looking and functional foot (Laaveg, & Ponseti, 1980).

Clubfoot is a complex deformity of foot and effect of the club foot deformity on the social and physical life among children with club foot and their caregivers could not emphasized (Wooly, & Kumar, 2016).

In a developing country like India and in remote areas, Ponseti method is very safe, easy, result-oriented and economical treatment method of clubfoot intervention; although relapses become after treatment and also relapse treated by repeat manipulation and weekly serial casting, motivation and advice long-term brace helps to maintain the correction for longer time and also can prevent relapse (Shivakumar, Afzal., & Chaitanya, 2016).

This study reported that the mean Pirani score before providing exercises with educational booklet for right feet among the clubfoot babies were 0.56 ± 0.33 (Booklet group) and after providing exercises with educational booklet for right feet among the clubfoot babies were 0.43 ± 0.41 (Booklet group)). Statistically it was found highly significant ($t= 2.99, p < 0.0003$). So it was concluded that exercises with educational booklet had significant influence on Pirani score reduction for right feet among the clubfoot babies. The mean Pirani score before providing exercises with educational booklet for left feet among the clubfoot babies were 0.53 ± 0.33 (Booklet group) and after providing exercises with educational booklet for left feet among the clubfoot babies were 0.44 ± 0.64 (Booklet group)). Statistically it was found highly

significant ($t= 0.14$, $p < 0.016$). So it was concluded that exercises with educational booklet had significant influence on Pirani score reduction for left feet among the clubfoot babies.

This study presented that the mean Pirani score before providing usual exercises for right feet among the clubfoot babies were 0.496 ± 0.13 (Non-booklet group) and after providing usual exercises for right feet among the clubfoot babies were 0.54 ± 0.53 (Non-booklet group)). Statistically it was found significant ($p < 0.029$). So it was concluded that usual exercises without educational booklet had influence on Pirani score increased for right feet among the clubfoot babies. The mean Pirani score before providing usual exercises for left feet among the clubfoot babies were 0.5 ± 0.15 (Non-booklet group) and after providing usual exercises for left feet among the clubfoot babies were 0.53 ± 0.48 (Non-booklet group)). Statistically it was found significant ($t= - 0.059$, $p < 0.056$). So it was concluded that usual exercises without educational booklet had influence on Pirani score increased for left feet among the clubfoot babies.

Limitation of the study:

- The study was conducted in a selected treatment center so study finding might not represent the scenario of the whole country.
- The findings of this study were based on a convenience sample of participants who brought their children for treatment at the Ponseti Clinics.
- Educational booklet was difficult to understand for some less educated caregivers.
- Some caregivers could not fill up the checklist of educational booklet
- Data collector was not blinding for this study
- Lack of randomization

Conclusion:

Club foot is most common musculoskeletal deformity at birth and early detection of club foot, actual assessment and early intervention are essential for achieving excellent treatment outcomes. Exact etiology of children club foot is unknown but different epidemiological research identified several factors such as increased uterine pressure, abnormal foetal positioning, constriction bands, temperature changes, unstitched uterus and placental insufficiency which linked to the etiology of clubfoot. Untreated CTEV lead to permanent disability which can create difficulties in walking, playing and perform ADL such as individual-care as well as neglected clubfoot causes lack of social integration, long term psychological burden, and financial burden for the family as well as the community. The modern treatment of clubfoot is Ponseti methods which are very effective, outcome oriented and less invasive surgical procedure. Pre-test Pirani mean score was reduced after providing exercises with educational booklet than post-test Pirani mean score among children with clubfoot in booklet as well as non-booklet group. So there was significant role of exercises with educational booklet rather than usual exercises by verbal instructions.

Recommendation:

Further study to validate this study finding with wider sample size covering other Ponseti clubfoot treatment clinics of the country is recommended. Awareness program related study is also recommended due to the clubfoot treatment by Ponseti methods made tremendous influence on caregivers having clubfoot baby. Educational booklet is recommended among children with clubfoot during bracing stage of treatment by Ponseti methods for preventing recurrent of clubfoot after treatment.

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Appendix-A



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)
(The Academic Institute of CRP)

Ref. CRP-BHPI/IRB/11/18/1280

Date: 24/11/2018

To
Ershad Ali
M.Sc. in Physiotherapy (MSc.PT)
Session: 2017-2018, Student ID-111170048
BHPI, CRP-Savar, Dhaka-1343, Bangladesh

Subject: Approval of thesis proposal "Effects of Educational Booklet among Children with Clubfoot during Bracing Stage of Treatment by Ponseti Methods" by ethics committee.

Dear Ershad Ali,

Congratulations,


The Institutional Review Board (IRB) of BHPI has reviewed the above mentioned thesis, with yourself, as the Principal Investigator" The Following documents have been reviewed and approved:

S.N.	Name of Documents
1.	Thesis Proposal
2.	Questionnaire (Bengali and English version)
3.	Information sheet & consent form.

Since the study involves use of semi-structure questionnaire to measure socio-demography and "Pirani Score" to measure the severity of clubfoot and "Bangla Clubfoot Tool" to measure parental rating, gait, heel position and ankle range at Ponseti clinic in CRP that may take 30 to 40 minutes to answer and fill in the questionnaire by assessors. Congenial and secure place of interview will have to be ensured by the investigator. In addition, the investigator will ensure appropriate compensation and, /or incentive for the participants, without affecting the participant's ability to reasonably decide to participate. Since, there is no likelihood of any harm to the participants; the members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 08.30 AM on 25th September, 2018 at BHPI.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring in the course of the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,


Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোন : ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪ ফ্যাক্স : ৭৭৪৫০৬৯

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404, Fax : 7745069, E-mail : contact@crp-bangladesh.org, www.crp-bangladesh.org

Appendix-B

Permission letter

Date: 20th November, 2018 .

To

The Head of the Department

Department of the Physiotherapy

Centre for the Rehabilitation of the Paralyzed

Chapain, Savar, Dhaka

Sub: Permission to conduct data collection in clinical setting for thesis.

Dear Sir,

I am a student of part – II MSc in Physiotherapy at BHPI under medicine faculty of Dhaka University. For partial fulfillment of my thesis of MSc.PT, I have to collect data from CRP on “Effects of Educational Booklet among Children with Clubfoot during Bracing Stage of Treatment by Ponseti Methods”. For this purpose, I need to conduct data collection in Ponseti-Clinic, CRP-Savar and Mirpur, Dhaka. So I want to collect data from your organization if you permit me.

My thesis objectives are:

Primary objective: To evaluate the effectiveness of educational booklet among children with clubfoot during bracing stage of treatment by Ponseti method.

Specific Objectives: To find out the socio-demographic characteristics of participants, To determine the severity of clubfoot during bracing stage of treatment before and after providing educational booklet, To demonstrate parental rating, gait, heel position and range of motion among children with clubfoot babies during bracing stage of treatment before and after providing educational booklet.

I pray your permission in this regard.

Yours Obediently

 20.11.18

Ershad Ali

MSc in Physiotherapy (Part-II)


Session: 2017- 2018

Roll no- 08

Approved

20/11/18

Mohammad Anwar Hossain
Associate Professor & Head
Physiotherapy Dept., CRP
CRP-Chapain, Savar, Dhaka-1343


20/11/18
Firoz Ahmed Mamin
Associate Professor
Dept. of Rehabilitation Science
Coordinator
M.Sc. in Physiotherapy Program
BHPI, CRP, Savar, Dhaka-1343

Date 20 11 2018

To

Joint Director of Operations,

Walk for Life- The National Clubfoot Program of Bangladesh

The Glencoe Foundation, Bangladesh

Subject Application for permission of data collection for MSc.PT thesis from walk For Life (Ponseti-Clinics).

Dear Sir

I am an employee of your organization. I am also MSc. in Physiotherapy student at Bangladesh Health Professions Institute under medicine faculty of Dhaka University. I need data from Walk for Life (Ponseti-Clinics) in Bangladesh for partial fulfillment of my MSc.PT thesis. My thesis title is "Effects of Educational Booklet among Children with Clubfoot during Bracing Stage of Treatment by Ponseti Methods". So I want to collect data from your organization if you will permit me.

My thesis objectives are:

Primary objective: To evaluate the effectiveness of educational booklet among children with clubfoot during bracing stage of treatment by Ponseti methods.

Specific Objectives: To find out the socio-demographic characteristics of participants. To determine the severity of clubfoot during bracing stage of treatment before and after providing educational booklet, To demonstrate parental rating, gait, heel position and range of motion among children with clubfoot babies during bracing stage of treatment before and after providing educational booklet.

Therefore, I hope that you would be granted me and oblige thereby.

Your obediently,

 11.18

Ershad Ali

Physiotherapist cum Ponseti Practitioner &

Manager-Ponseti Clinic (Walk for Life- The National Clubfoot Program of Bangladesh)

The Glencoe Foundation, Khulna

Dear Ershad Ali,

*permission granted & best wishes for
your thesis.*

M.M.H.

09.12.2018.

*Md. Mamun Hossain Chowdhury
Joint Director of operations
Walk For Life.*

সম্মতিপত্রঃ

তারিখঃ ১৬-১১-২০১৮

আসসালামুআলাইকুম। আমি এরশাদ আলী, বাংলাদেশ হেল্থ প্রফেসন্স ইন্সটিটিউট যাহা ঢাকা বিশ্ববিদ্যালয় অদিত্তুক্ত এমপিটি প্রোগ্রামের ছাত্র। আমি একটি গবেষণা কর্ম করছি যার শিরোনাম হল “পনসেটি চিকিৎসার জুতা পরানোর সময় মুগুর পা এর বাচ্চাদের এডুকেশনাল বুক লেট এর প্রভাব ”। আপনার কাছ থেকে **আপনার ছেলের কিছু ছবি তুলতে** চাই। আমি আপনাকে জানাতে চাই যে এটি একটি সম্পূর্ণরূপে একাডেমিক গবেষণাকর্ম এবং আপনার প্রদত্ত ছবি সমূহ অন্য কোন **থারাপ** উদ্দেশ্যে ব্যবহৃত হবে না।

আমি আপনার সহযোগিতায় কৃতজ্ঞ হব। আপনি যদি **আপনার ছেলের ছবি তুলতে** দিতে সম্মত হন তবে নির্দিষ্ট স্থানে স্বাক্ষর করুন।

স্বাক্ষর ও তারিখঃ হাফিজ ক্রিম, ১৭/১১/২০১৮

গবেষকের স্বাক্ষর ও তারিখঃ  17.11.18



বাংলাদেশ হেল্থ প্রফেশন্স ইনস্টিটিউট (বিএইচপিআই)
Bangladesh Health Professions Institute (BHPI)

(The Academic Institute of CRP)

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Date: 24/11/2018

To
Ershad Ali
M.Sc. in Physiotherapy (MSc.PT)
Session: 2017-2018, Student ID-111170048
BHPI, CRP-Savar, Dhaka-1343, Bangladesh

Subject: Approval of thesis proposal "Effects of Educational Booklet among Children with Clubfoot during Bracing Stage of Treatment by Ponseti Methods" by ethics committee.

Dear Ershad Ali,

Congratulations,

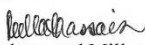
The Institutional Review Board (IRB) of BHPI has reviewed the above mentioned thesis, with yourself, as the Principal Investigator" The Following documents have been reviewed and approved:

S.N.	Name of Documents
1.	Thesis Proposal
2.	Questionnaire (Bengali and English version)
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Since the study involves use of semi-structure questionnaire to measure socio-demography and "Pirani Score" to measure the severity of clubfoot and "Bangla Clubfoot Tool" to measure parental rating, gait, heel position and ankle range at Ponseti clinic in CRP that may take 30 to 40 minutes to answer and fill in the questionnaire by assessors. Congenial and secure place of interview will have to be ensured by the investigator. In addition, the investigator will ensure appropriate compensation and, /or incentive for the participants, without affecting the participant's ability to reasonably decide to participate. Since, there is no likelihood of any harm to the participants; the members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 08.30 AM on 25th September, 2018 at BHPI.

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Best regards,


Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

সিআরপি-চাপাইন, সাভার, ঢাকা-১৩৪৩, বাংলাদেশ, ফোন : ৭৭৪৫৪৬৪-৫, ৭৭৪১৪০৪ ফ্যাক্স : ৭৭৪৫০৬৯

CRP-Chapain, Savar, Dhaka-1343, Tel : 7745464-5, 7741404, Fax : 7745069, E-mail : contact@crp-bangladesh.org, www.crp-bangladesh.org

Appendix-C

Informed Consent Form

BHPI under Dhaka University

Code:

Date:...../...../.....

Name of the respondent.....

I am Ershad Ali, a student of M.Sc.PT program Bangladesh Health Professions Institute (BHPI) under medicine faculty of Dhaka University. As a course requirement I am doing a research on, “Effects of educational booklet among children with clubfoot during bracing stage of treatment by Ponseti methods.” I am inviting you to participate in this research study. I need some valuable information from you as a part of my academic purpose. Your co-operation will be highly appreciable. You can refuse to answer any questions or may leave any time you feel like. If your refuse or leave you will not face any problem. All the information given by you will be kept confidential. Your identity will not be disclosed. Only study-related personnel will be allowed to see the information.

I would appreciate your co-operation. If you agree to join the study please sign at the space indicated below.

Investigator’s signature & Date

Volunteer’s signature & Date

Witness signature/Thumb impression & Date

সম্মতিপত্রঃ

কোড :

তারিখঃ.....

উত্তর দাতার নামঃ.....

আসসালামুআলাইকুম। আমি এরশাদ আলী ঢাকা বিশ্ববিদ্যালয় অদিতুক্ত বাংলাদেশ হেল্থ প্রফেসস ইন্সটিটিউট এমপিটি প্রোগ্রামের ছাত্র। আমি একটি গবেষণা কর্ম করছি যার শিরোনাম হল “পনসেটি চিকিৎসার জুতা পরানোর সময় ক্লাবফুট শিশুদের শিক্ষণীয় বইয়ের প্রভাব ” আমি আপনাকে এই গবেষণায় অংশগ্রহণের আমন্ত্রণ জানাচ্ছি। আপনার কাছ থেকে কিছু তথ্য জানতে চাই। আপনাকে উক্ত গবেষণা কর্মে কিছু প্রশ্নের উত্তর দিতে হবে যা এই ফর্মে উল্লেখ আছে। আমি আপনাকে জানাতে চাই যে এটি একটি সম্পূর্ণরূপে একাডেমিক গবেষণাকর্ম এবং আপনার প্রদত্ত তথ্য সমূহ অন্য কোন উদ্দেশ্যে ব্যবহৃত হবে না। আপনার নাম প্রকাশনায় গোপন থাকবে। এই গবেষণা কর্মে আপনার অংশগ্রহণ ঐচ্ছিক এবং গবেষণাকর্মের যে কোন সময় এত অংশ নেয়া থেকে বিরত থাকতে পারবেন। ইন্টারভিউ চলাকালীন কোন নির্দিষ্ট প্রশ্নের উত্তর না দিতে চাইলে প্রশ্নের উত্তর না দেওয়ার অধিকার আপনি সংরক্ষণ করেন।

আমি আপনার সহযোগিতায় কৃতজ্ঞ হব। আপনি যদি গবেষণায় যোগ দিতে সম্মত হন তবে নির্দিষ্ট স্থানে স্বাক্ষর করুন।

তথ্য গ্রহণকারীর স্বাক্ষর ও তারিখঃ.....

গবেষণায় অংশগ্রহণকারীর স্বাক্ষর ও তারিখঃ.....

গবেষকের স্বাক্ষর ও তারিখঃ.....

গবেষণার নামঃ পনসেটি পদ্ধতিতে ক্লাবফুট চিকিৎসায় জুতা পরিধান করার সময় শিক্ষণীয় বইয়ের ভূমিকা।

(প্রশ্নপত্র)

ঠিকানাঃ গ্রাম/এলাকাঃ	পোস্ট অফিসঃ	থানাঃ
জেলাঃ	বিভাগঃ	মোবাইলঃ
তারিখঃ	রোগীর কোড নং-	তথ্য গ্রহণের স্থানঃ

অধ্যায়-১

রোগীর (শিশুর) পরিচিতি, আর্থ-সামাজিক অবস্থা এবং মুণ্ডর পা সম্পর্কিত কিছু তথ্য। (লিখুন/টিক চিহ্ন দিন)

১	শিশুর বয়স কত (মাসে)?
২	শিশুর অভিভাবক কে? ১। মা ২। বাবা ৩। অন্যান্য তত্ত্বাবধায়কারী
৩	মায়ের বয়স কত (বছরে)?
৪	মায়ের পড়াশুনা কতদূর ? ১। কোন প্রাতিষ্ঠানিক শিক্ষা নেই ২। প্রাইমারী ৩। মাধ্যমিক ৪। উচ্চ মাধ্যমিক ৫। স্নাতক ৬। মাস্টার্স ৭।
৫	মা কি কাজ করেন? ১। গৃহিণী ২। চাকুরীজীবী ৩। ব্যবসায়ী ৪। দিনমজুর ৫।
৬	বাবার বয়স কত(বছরে)?
৭	বাবার পড়াশুনা কতদূর? ১। কোন প্রাতিষ্ঠানিক শিক্ষা নেই ২। প্রাইমারী ৩। মাধ্যমিক ৪। উচ্চ মাধ্যমিক ৫। স্নাতক ৬। মাস্টার্স ৭।
৮	বাবা কি কাজ করেন? ১। বেকার ২। কৃষক ৩। চাকুরীজীবী ৪। ব্যবসায়ী ৫। দিনমজুর ৬।
৯	অন্যান্য তত্ত্বাবধায়কারীর বয়স কত(বছরে)?
১০	অন্যান্য তত্ত্বাবধায়কারীর পড়াশুনা কতদূর? ১। কোন প্রাতিষ্ঠানিক শিক্ষা নেই ২। প্রাইমারী ৩। মাধ্যমিক ৪। উচ্চ মাধ্যমিক ৫। স্নাতক ৬। মাস্টার্স ৭।
১১	আপনার পরিবারে মাসিক আয় কত?
১২	আপনার পরিবারে সদস্য কতজন?
১৩	আপনার পরিবারে কতজন পড়াশুনা করেন।
১৪	আপনারা কেমন পরিবারে বসবাস করেন? ১। একক পরিবার ২। যৌথ পরিবার
১৫	আপনার বসবাসের স্থান কেমন? ১। শহর ২। মফস্বল ৩। গ্রাম ৪। বস্তি ৫।
১৬	আগে আপনার পরিবারের মধ্যে এই ধরনের পা বাকা ছিল কি? ১। হ্যাঁ ২। না
১৭	আপনার পরিবারের কার মধ্যে এই ধরনের পা বাকা ছিল?

	১। বাবা ২। মা ৩। ভাই ৪। বোন ৫। দাদা ৬। দাদি ৭। নানা ৮। নানি ৯।
১৮	আপনার কি ছেলে না মেয়ে? ১। ছেলে ২। মেয়ে
১৯	আপনার শিশুদের মধ্যে এর অবস্থান কততম?
২০	আপনি কি আগে ক্লাবফুট এর নাম জানতেন? ১। হ্যাঁ ২। না
২১	আপনার শিশুকে কয় ঘণ্টা জুতা পরিধান করেন?
২২	আপনার শিশুকে জুতা পরিধান করতে কোন সমস্যা হয়? ১। হ্যাঁ ২। না
২৩	যদি হ্যাঁ হয় তবে, কি ধরনের সমস্যা হয়? (৩ মাস পর..., ৬ মাস পর..., ৯ মাস পর..., ১ বছর পর...) ১। ব্যথা হয় ২। ফুলে যায় ৩। এমনিতেই পড়তে চায় না ৪।
২৪	আপনি কখন (কত বয়সে) আপনার শিশুর চিকিৎসা নিতে এসেছিলেন?
২৫	আপনার শিশুর কয় পায়ে সমস্যা? ১। এক পা ২। দুই পা

Title of the study: Effects of educational booklet among children with clubfoot during bracing stage of treatment by Ponseti methods.

(Questionnaire)

Address: Village/ Area:	Post office:	Thana/ P.S:
District:	Division:	Mobile:
Date:	Code :	Location:

CHAPTER-I

Questions related to socio-demographic and about clubfoot information.

1.	How old are your child? (In months)
2.	Who is child caregiver? 1. Mother 2. Father 3. Other caregiver
3.	How old is mother? (In years).....
4.	what is mother educational level? 1.No institutional education. 2.Primary (I-V) 3.Secodary (VI-SSC) 4.Higher secondary (XI-HSC) 5.Honors 6. Masters 7.Others
5	What is occupation of mother? 1. Housewife 2. Service holder 3. Business 4. Day labor 5.
6	How old is father? (In years)
7	What is father educational level? 1.No institutional education. 2.Primary (I-V) 3.Secodary (VI-SSC) 4.Higher secondary (XI-HSC) 5.Honors 6. Masters 7.Others
8	What is occupation of mother? 1.Unemployed 2. Farmer 3. Service holder 4. Business 5. Day labor 6.....
9	How old is other caregiver?.....
10	what is other caregiver educational level? 1.No institutional education. 2.Primary (I-V) 3.Secodary (VI-SSC) 4.Higher

	secondary (XI-HSC) 5.Honors 6. Masters 7.Others
11	What is your total monthly family income?.....
12	How many members in your family?.....
13	How many studying members in your family?.....
14	What type of family do you belong to? 1. Nuclear 2. Joint
15	Pattern of your living place? 1. Urban 2. Semi-urban 3. Rural 4. Slum 5.....
16	Have any of your blood connected person had clubfoot before time in yours family? 1. Yes 2. No
17	If yes, Who had this problem? 1. Father 2. Mother 3. Brother 4. Sister 5. Grandfather 6. Grandmother 7. Others.
18	Sex of your baby? 1. Male 2. Female
19	Position of your index baby among siblings?.....
20	Do you know the name of clubfoot ever? 1. Yes 2. No
21	How many hours you wore shoe to your child?.....
22	Have you face any difficullties during wear brac? 1. Yes 2. No
23	If yes, what type of difficulties you faced? 1. Pain 3. Swelling 3. Can not wear brace due unknown reason 4.....
24	When you came to take treatment for your child? (In months).....
25	Which feet are affected of your child? 1. Unilateral 2. Bilateral

CHAPTER-II

Pirani Score for Clubfoot

	During First day of treatment		First day during provided / not provided Booklet		After 3 months		After 6 months		After 9 months		After 1 year	
	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt	Rt	Lt
PC												
EH												
RE												
HFCS total												
MC												
LHT												
CLB												
MFCS total												
Signature												

1. PC – Posterior Crease, 2. EH – Empty Heel, 3. RE – Rigid Equinus, HFCS – Hind Foot score, 4. MC – Medial Crease, 5. LHT – Lateral Head of Talus, 6. CLB – Curved Lateral Border, MFCS – Mid Foot Score

Appendix-D

Exercises protocol

Type of exercises	Frequency	Intensity	Time
1. Passive calf muscles stretching	10 repetition	2 time/day	
2. Peroneal exercise	10 rep.	2 time/day	
3. Active exercises	10 rep.	2 time/day	
4. Bridging	10 rep.	2 time/day	
5. Sit to stand practice	10 rep.	2 time/day	
6. Squatting	10 rep.	2 time/day	
7. Gait training		2 time/day	3-5 min.
9. Standing on heels		2 time/day	3-5 min
10. Single leg standing	10 rep.	2 time/day	
11. Ramp stretching.		2 time/day	10 min