

DEMOGRAPHIC PROFILE OF CEREBRAL PALSY:A RETROSPECTIVE STUDY

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Bachelor of Science in Physiotherapy (B. Sc.PT)

Session: 2007-2008

BHPI, CRP, Savar, Dhaka



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We the undersigned certify that we have carefully read and recommended to the Faculty of Medicine, University of Dhaka, for the acceptance of this dissertation entitled

**DEMOGRAPHIC PROFILE OF CEREBRAL PALSY:A
RETROSPECTIVE STUDY**

Submitted by **Jinat Mahmuda**, for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT)

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Declaration

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistake is my own. I also declare that for any publication, presentation or dissemination of information of the study. I would be bound to take written consent of my supervisor.

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Acronyms

BHPI	Bangladesh Health Professions Institute
CP	Cerebral Palsy
CRP	Centre for the Rehabilitation of the Paralyzed
SPSS	Statistical Package for the Social Sciences
UK	United Kingdom
US	United States
WHO	World Health Organization

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Abstract

Purpose: To find out the demographic profile of cerebral palsy patients at CRP. *Objectives:* The aim of this study was to explore which age group is more vulnerable for this disease and to identify which gender is more affected of cerebral palsy patients. *Methodology:* The study design was cross sectional. The sample size were 300 and Purposive sampling technique was used for sample selection who was admitted in Pediatric unite in Centre for the Rehabilitation of the Paralyzed (CRP) in Bangladesh. Data was collected by a standard questionnaire and it was analyzed by SPSS software version 16.0. *Results:* Among 300 cerebral palsy patients, most of the patients were under 10 years old. The age range are 1-9 years and male 64% (n=192) are higher than female 36% (n=108). Majority of patient's mother are housewife 96% (n=289). Family had one child 46%, Two 31%, Three 16.7%, and more than three 6.3%. But duration of participants birth time were prolonged labor 62.7% (n=188), where short labor 32.3% (n=97), and sudden birth 5% (n=15). Most of the participants were from low socio economic condition and low educational level. *Conclusion:* The result of the study reflects the current situation of children with cerebral palsy at the age of 1-9 years and who attended at the Centre for the Rehabilitation of the Paralysed.

1. 1 Background

Bangladesh is one of the densely populated countries in the world. Disability is a major social and economic phenomenon in the country. In this country, disability is the most challenging issue. Cerebral palsy is the most common condition that is responsible for the child disability. A child is born in family as the torch bearer, but when it is born with any disability then it bears curse for its family, even the parents are treated as the results of great sin. Now-a-days, this thinking has been changed enough in most of the countries of the developed world, but some developing countries like Bangladesh yet now is not enough aware of disability (Werner, 1988).

In childhood there are many diseases are affected among them Cerebral palsy (CP) who is the most common motor disease. It is a central nervous system disorder that is accompanied by disturbance of sensation, perception, communication, cognition, epilepsy and musculoskeletal disorders (Hwang et al., 2011). In childhood we know, Cerebral palsy is the most common physical disability and the main cause is unknown. The term 'Cerebral palsy' defines a group of disorder of movement and posture due to a defect of the immature brain. It has various types, degree of motor impairment and complex symptom. Cerebral palsy is a symptom complex with various types and degree of motor impairment. These disorders become marked early in life and are permanent and non-progressive condition (Reddihough & Collins, 2003). In Australia, CP occurring in approximately 2 to 2.5 per 1000 live births which is the main cause of physical disability in children. There has been aggregate interest in the quality of life of children with CP in recent years (Davis et al., 2009).

In USA, caregivers of children with CP may be under more physical, psychological, and financial burdens compared with those who provide care for children who develop in a typical manner because their responsibilities are greater. In addition to providing direct daily care and support, caregivers of children with CP invest time and effort in assisting with interventions such as physical, occupational, and speech therapy. Thus caregivers' perceptions of their child's needs and of efforts related to the daily care of their child are likely to have substantial impact on the selection and

success of the child's rehabilitative management (Hwang et al., 2011). In UK, one in five children with CP (20.2%) was found. They had a severe intellectual deficit and were unable to walk. Among babies born weighing less than 1500g, the rate of CP was more than 70 times higher compared with those weighing 2500g or more at birth, the rate of CP rose during the 1970s, but remained constant during the late 1980s (Johnson, 2002).

In Canada, CP increases prevalence temporally may be anticipated given the large declines that have been detected in neonatal and infant mortality rates. It is not surprising to observe increases in population rates of CP and other disabilities, especially very preterm infants, surviving past infancy with more infant. Other hand multiple births and preterm births, have increased, which is the higher rates of CP. We therefore, conducted a population-based study to evaluate temporal changes in the prevalence of CP and the rate of infant death in a birth cohort of 24- to 30-week infants who were born between 1993 and 2002 (Vincer et al., 2006). A report of child disability where 42% of total disability was cerebral palsy, among these spastic tetraplegia 19%, spastic diplegia is and ataxic is 3%. From this statistics it is clearly seen that cerebral palsy has covered a large area in the field of cerebral palsy disability in Bangladesh according to disability profile the Client assess in the Shishu Bikash clinic (Rural center) during January to December 1998 showed (Khan & Rahman, 2000).

In recent years, the prevalence of CP has been consistently expected at 2.0 to 2.5 cases per 1000 live births. These estimates turn into 15,000 to 20,000 children with CP in Canada and 1,50,000 in the United States, that the massive majority of whom are cared for at home by their parents and families (Brehaut et al., 2004). A study in UK showed that prevalence rates differs from 1.5/1000 live births to 3/1000 live births (Johnson, 2002). Disability in a child resulting from CP not only affects the child's life but also the family's life. Everyday problems in caring for a child with disabilities are difficult. The parents and other members of family, relatives and even neighbors experience stress to a variable extent. Children with disabilities mostly live in developing countries. In developing countries the majority of families are already living under difficult conditions with few resources and little access to appropriate

services. The prevalence of disability in a population of children ages 2-9 years from both urban and rural populations was estimated to be 70/1,000 for all grades of severity and 22/1,000 for serious disability in Bangladesh (Mobarak et al., 2000). Study shows that cerebral palsy rates vary among populations in relation to age, gender, race, marital status, occupation and differences in temporal or environmental conditions (Kasiulevicius et al., 2006).

Cerebral palsy is not well-defined by aetiology or pathology. It is an etiologically and pathologically diverse that is not amazing. Causative agent may be single or multiple that may be genetic (rarely) or during pregnancy period or early life up to the chance of significant age. Our understanding is developing, but the majority of etiological mechanisms remain unproven, poorly understood or completely unrecognized, the epidemiology of cerebral palsy seeks to explain etiological mechanisms as a first step towards prevention since incurable of cerebral palsy (Blair and Stanley, 1997). Cerebral palsy is treated by Pediatric physiotherapists and they work multi-disciplinary team approach in CRP. Physiotherapist's uses combination of treatment are Neurodevelopment Treatment, Sensory integrative therapy and Proprioceptive Neuromuscular facilitation (Mahmud, 2003).

1.2 Rationale

Cerebral palsy is a common condition, mostly seen in developing country. Day by day there is increasing the number of cerebral palsy patient, in different areas. As Bangladesh is a developing country and trying to develop health care system so it is important to know the study will create and overview about demography of cerebral palsy. Physiotherapy is a significant part of this multi-disciplinary team. As the physiotherapy profession is newly introduced in Bangladesh, many people are not aware of its purpose. But it is an important part of health care to prevent diseases as well as to improve or maximize independence in people with disabilities. Therefore, physiotherapy can play an absolute role in preventing Cerebral palsy and aware the people about it which is essential to strengthen our profession. It generates exact information considering detail about which causes, occupation, age, gender, diagnosis, and duration. This study is about the demographic profile of cerebral palsy. It helps to raise awareness among the population and to get information about cerebral palsy.

1.3 Research Question

What are the demographic profiles of cerebral palsy?

1.4 Objectives of study

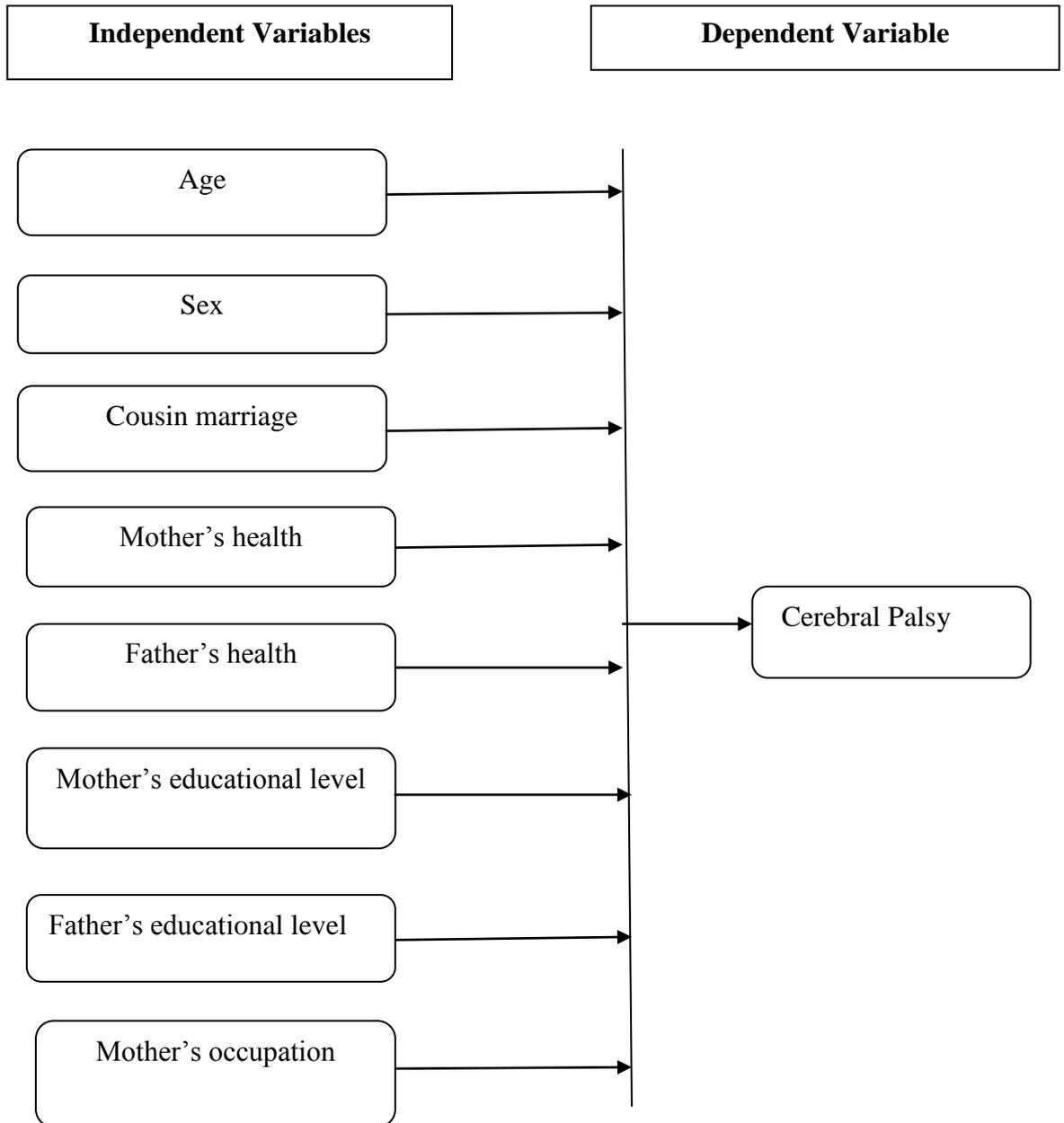
1.4.1 General objective

- To find out the socio-demographic information of patient with cerebral palsy.

1.4.2 Specific objectives

- To explore which age group are more vulnerable for this disease.
- To identify which gender are more affected.
- To find out causes & the common type of cerebral palsy.

1.5. List of variables



1.6 Operational definition

Cerebral palsy

Cerebral palsy is a condition caused by damage to the brain, usually occurring before, during or after birth. It results in sensory motor disorders that affects the control of posture and movement and caused by birth injury, congenital defects, and infectious disease.

Spastic cerebral palsy

Spastic cerebral palsy is where there is too much muscle tone or tightness. Movements are stiff, especially in the legs, arms or back.

Ataxic Cerebral palsy

Defective muscular coordination especially that manifested when voluntary muscular movement are attempted. Main motor characteristics are disturbance of balance, voluntary movement present but uncoordinated.

Athetoid Cerebral palsy

It can affect movement of the entire body, which may be slow or fast. Typically this form of cerebral palsy involves slow, uncontrolled body movement and low muscle tone that makes it hard for the person to sit straight and walk.

Mixed cerebral palsy

This type is common for children to have symptoms that didn't correspond to any single type of cerebral palsy. It is the combinations of the symptoms listed are child with mixed CP has both high and low muscle tone, some muscles are too tight and others are too loose, mix of stiffness and involuntary movement.

Cerebral palsy exactly means brain paralysis (Alvarez, 2013). ‘Cerebral’ refers to the brain and ‘Palsy’ to a disorder of movement or pressure. If someone has cerebral palsy it means because of an injury to the brain (cerebral) he or she is not able to use some of the muscles of body in normal way. CP is a group of condition that affects the movement and posture of body.

Cerebral palsy is the most common neurodevelopmental motor disability in children. The condition requires medical, educational, social, and rehabilitative resources throughout the lifespan (Hurley et al., 2011). Cerebral palsy is considered to be a non-life-threatening condition when the children born with the exception in severe case. In adulthood, most of the children with cerebral palsy are expected to live well (Mychild, 2013). Cerebral palsy is a disorder of movement, muscle tone or posture that is caused by injury or abnormal development in the immature brain, most often before birth (Myoclinic, 2013). Until 1-3 years of life, cerebral palsy is not often identified but it is a birth defected diseases. Control of the movement and posture that affect are caused by CP. An affected child cannot move his muscles of the body normally because damage of the brain are that that control of the movement (American pregnancy association, 2013). According to the Surveillance of CP in Europe (SCPE) definition, cerebral palsy is a group of permanent and non-progressive disorders of movement and posture caused by a central nervous lesion, damage or dysfunction originating early in life (Elkamil et al., 2011).

Cerebral palsy is the most common chronic motor disorder of childhood, affecting approximately 2 to 2.5 infants per 1,000 live births. The increase in survival rates for preterm infants has amplified the risk of brain injuries that potentially cause CP. In addition to immeasurable health, social, and psychological problems that the affected children and their families suffer CP has a huge economic impact (Faria et al., 2011). Cousin marriage is one of the responsible occurring for cerebral palsy. Since cousins have one or both grandparents in common and if either of the two grandparents, maternal or paternal carries a defective recessive gene, it stands a good chance of becoming homozygous in any one child who is a product of such consanguineous

marriages (Islam & Ahmed, 2009). The risk of neonatal are increased in white matter damage and later motor, cognitive, and behavioral impairments while babies born at very low gestational ages. The low gestational age and cerebral white matter damage lead to preterm birth can damage the developing brain. The pregnancy disorder is also potential factor for damaging the developing brain. Cranial ultrasound lesions was manifested that also causes CP diagnosed later (McElrath et al., 2009).

Cerebral palsy is a long term condition and most common physical disability in childhood. In adulthood children with cerebral palsy is poorly understood and usually survive. There is a male: female ratio of 1.5:1 in the population (Clinical Key,2012).In developed countries, International assessments propose that CP affects between 1.2 and 3.0 per 1000 children (Hustad et al., 2011). In the Norwegian counties there were 494 children with CP born between 1st January 1996 and 31st December 2003, corresponding to a prevalence of 2.65 per 1000 live births (Elkamil et al., 2011). In United States, there are living almost 800,000 children and adults inwith one or more of the symptoms of cerebral palsy estimated the Foundation of the United Cerebral Palsy (UCP). Every year about 10,000 babies born in the United States will develop cerebral palsy according to the federal government's (Centers for Disease Control and Prevention National Institute of Neurological Disorder and Stroke, 2012).

In United States, the specific prevalence of CP is uncertain because consistent information is lacking on follow-up of an entire population. Majority of births especially involve for term and late preterm infants. In the United States estimated a prevalence of 3.6 cases per 1000 children at eight years of age where a population study was showed, using data from three regions but the study between children with and without a history of prematurity did not distinguish (Miller, 2013). The United States shows that CP may affect up to 3.6 per 1000 children in another study (Hustad et al., 2011).

The prevalence is presented that 1.5 to 2.5 per 1,000 live births. In CP, time trends are due to advances in perinatal care in the last 40 years. During the 1980s, there was a sharp increase in very low birth weight infants in prevalence of CP. For infants in

intensive care which has been attributed to the increased survival due to advances stages of life. This recent increase seems to have leveled off and may be on the decline. Mild forms of CP patients not severe in functional impairment may remain undiagnosed, which leads to underestimation of the true prevalence of CP (Clinical Key, 2012). The prevalence of disability of moderate and severe is estimated to be 5% in children aged 0–14 years. In low-income countries disability among children is more common than high-income countries (Kawakatsu et al., 2012).

Before birth, occurs the disruption of normal development of the brain result of CP in about 70% cases. According to a 2003 report by the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) conflicting to common belief that lack of oxygen reaching the fetus during labor and delivery contributes to only a small minority of cases of cerebral palsy. A slight number of babies also develop brain injuries in the first months or years of life result in cerebral palsy. In child the cause of cerebral palsy is unknown in many cases (American pregnancy association, 2013). We know the cause of CP is unknown. Brain injury or brain malformation is the cause of cerebral palsy that occurs while the brain is developing — before, during or after birth. Muscle control, muscle coordination, muscle tone, reflex, posture and balance also disturbed due to cerebral palsy. It can also impact fine motor skills, gross motor skills and oral motor functioning (My child, 2002).

In many cases, the cause of congenital cerebral palsy is not identified. According to the timing of the brain insult, CP is valuable to classify the known causes whether prenatal, perinatal or postnatal. Congenitally brain malformations which including malformations of cortical development are caused by antenatal of CP. In general congenital malformations are strongly connected with cerebral palsy and children with congenital brain malformations also have more anomalies outside of the central nervous system. Metabolic disorders, maternal ingestion of toxins and rare genetic syndromes are less common cause of CP (Reddihough & Collins, 2003). During a baby's development in the womb, congenital cerebral palsy results from brain injury. It is present at birth although it may not be detected for months. It is responsible for about 70% of children of cerebral palsy (WebMD, 2013).

Cerebral palsy includes a group of permanent disorders of movement or posture caused by an early brain injury. Although several factors including preterm birth and low birth weight for gestation are associated with excess risk, the causes of cerebral palsy remain largely unknown. Pre-eclampsia affects 3-5% of pregnant women and is characterized by maternal hypertension and proteinuria occurring after 20 weeks of gestation. Serious manifestations may induce iatrogenic preterm delivery and pre-eclampsia contributes substantially to prematurity, perinatal morbidity, and mortality. Early onset pre-eclampsia is commonly associated with severe placental dysfunction, which can compromise fetal blood supply and cause fetal growth restriction, chronic hypoxemia and possibly brain damage. Hence it is plausible that pre-eclampsia could be a risk factor for cerebral palsy (Melheim et al., 2013).

CP is classified into four categories. They are Spastic, Athetoid, Ataxia and Mixed type of CP. Spastic cerebral palsy is the most common type of CP. Spastic cerebral palsy refers to the increased tone, or tension, in a muscle when normal muscles work in pairs. Allowing free movement in the desired direction when one group contracts and the other group relaxes. The flow of muscle tension and the normal ebb is disrupted, due to complications in brain-to-nerve-to-muscle communication. Muscles affected by spastic cerebral palsy become active together and restricted in actual movement. This causes the muscles in spastic cerebral palsy patients to be constantly tense or spastic. Mild cases of spastic cerebral palsy patients may have affect only a few movements or severe cases that can affect the whole body. Although spastic cerebral palsy is non-progressive disorder as brain damage does not get worse over time, spasticity in muscles can increase over time. In spastic cerebral palsy can limit the range of movement in the joints when increased muscle tones and stiffness. Leading to excessive fatigue the effects of spastic cerebral palsy may increase with anxiety or exerted effort (Cerebral palsy source, 2005).

The second most common type of cerebral palsy is athetoid or dyskinetic. Dyskinesia means repetitive movements almost like a tic while an athetosis person who has slow involuntary movements especially in the arms. Muscle tone has varied with this type of CP children. Sometimes their muscles are stiff and rigid and other

times they are loose and floppy. Athetoid or dyskinetic CP results from damage to one or more of these areas of the brain- the basal ganglia, the corticospinal tract and the motor cortex. May have difficulty in walking, talking, eating, sitting upright, and performing basic motor skills in case of athetoid type of CP (Discovery fit and health, 2013).

Now-a-days about 4% of people have cerebral palsy. Inability to activate the correct pattern of muscles during movement ataxia is defined. To find out very difficult to balance of people with ataxic cerebral palsy. Ataxia affects the whole body. They may also have poor spatial awareness which means it is difficult for them to judge their body position relative to things around them. Most people with ataxic cerebral palsy can walk but they will probably be unsteady with shaky movements. Speech and language can also be affected. Many children with cerebral palsy have multiple symptoms with combinations of the various forms of cerebral palsy. For example children with spastic cerebral palsy often continue to have a head lag which is representative of hypotonic (Medicine net.com, 2013).

From literally pathology which the study of disease is unique because it is a basic science as well as a medical consultant. It is indeed a fundamental discipline necessary in the education of all medical doctors which concepts of disease processes, tissue reaction and injury (Prahlow & Vogel, 1994). Importantly all four criteria must be met: 1) Evidence of metabolic acidosis in fetal umbilical cord arterial blood obtained at delivery, 2) Early onset of severe or moderate neonatal encephalopathy in infants born at 34 or more weeks' gestation, 3) Cerebral palsy of the spastic quadriplegic or dyskinetic type and 4) Exclusion of other identifiable etiologies, such as trauma, coagulation disorders, infectious conditions or genetic disorders (Hankins, 2003).

In residential care quadriplegic cerebral palsy with children and young adults has been observed in high incidence of long-bone fractures the majority of fractures were in the upper extremities (Developmental Medicine & Child Neurology, 2002). Pathological changes in hip in cerebral palsy children. In children with CP the secondary musculoskeletal problem is hip displacement. Children with CP are demonstrated

progression of hip displacement from early age, while children are born with allocated hips. In the incidence of non-ambulatory children are impaired, in severe cases (Boyd et al., 2013). Some hip deformities in cerebral palsy, they are: coxavalga, slanting acetabula, subluxation, dislocated upward and coxavara. We also believe that the semi-tendinosus and semi-membranous is involved in both the hip adduction and the knee flexion deformities. During operation tenotomy is performed that is maintained stretch reflex (Baker et al., 1962).

Cerebral palsy is a neurological disorder the signs or symptoms of cerebral palsy may appear soon after birth or may take several months (Mandal, 2013). The most common early sign of cerebral palsy is developmental delay. Delay in reaching key growth milestones such as rolling over, sitting, crawling and walking are cause for concern. Physicians will also look for signs such as abnormal muscle tone, unusual posture, persistent infant reflexes and early development of hand preference (My child, 2013). Common signs of severe CP that may be noticed shortly after birth include: problems sucking and swallowing, weak or shrill cry, seizures and unusual positions. Often the body is either very relaxed or floppy or very stiff (WebMD, 2011).

In some severe cases many signs and symptoms are not readily visible at birth except and may appear within the first three to five years of life as the brain and child developed (My child, 2013). Severe motor and coordination impairment also occur (Mandal, 2013). Drooling is another but common symptom among children with CP. The prevalence has been showed from 16.8% to 58%. Frequent drooling may cause skin maceration and infection, body fluid loss, and recurrent pneumonia. At school and at home, children with salivary secretions may cause damage to books, teaching materials and furniture, and it even interferes with social relationships. It is informed that children with CP that drool are often avoided by other children, and familiar and unfamiliar adults. The drooling in children with CP could affect withincrease their dependent level of care of daily living and their educational level. Some studies advise that drooling might be associated with a reduced quality of life among children with CP (Chang et al., 2012).

Brain structure damage is irreversible and permanent. And the symptoms are variable that changed over time. Children have movement and postural disorder associated with many disabilities such as- including intellectual disability, hearing and visual deficits, nutrition, feeding and swallowing problems, respiratory infections and epilepsy. Cerebral palsy suffers for long term and it affect activities of daily living and quality of life (Bell et al., 2010). The most common type of cerebral palsy is spastic CP. It causes the muscles to be stiff and permanently contracted. The names of these types combine a Latin prefix describing the number of affected limbs with the term plegia meaning paralyzed or weak: diplegia—either both arms or both leg, hemiplegia—limbs on only one side of the body, quadriplegia—all four limbs, monoplegia—one limb and triplegia—three limbs. Spastic diplegia affects the legs more than the arms (Health.com, 2013). Signs can appear during several stages of early life. They include: neonatal – early Infancy (0-3 Months): high pitched cry, poor neck control, excessive lethargy or irritability, weak suck or tongue thrust or tonic bite, oral hypersensitivity, decreased interest in surroundings, stiff or floppy posture, abnormal or prolonged reflexes. Later infancy-inability to perform motor skills control of hand grasp by 3 months, rolling over by 5 months and independent sitting by 7 months. Abnormal developmental patterns: hand preference by 12 months, excessive arching of back, prolonged or abnormal parachute response, logrolling. Abnormal developmental patterns after 1 year of age: W sitting means both knee flexion, legs extremely rotation, bottom shuffling means scoots along the floor, tiptoe walking or hopping (Gershon et al., 2013).

The symptoms of cerebral palsy include: excessive drooling, difficulty swallowing, sucking or speaking, tremors, and trouble with fine motor skills such as fastening buttons or holding a pencil, stiff or tight muscles, low muscle tone, exaggerated reflexes, uncontrolled body movement, toe walking, limping or dragging a foot while walking, walking with a scissor gait, turning in their legs as they walk. Children with cerebral palsy can also have feeding problems, mental retardation, seizures, learning disabilities and problems with their vision and hearing. The symptoms don't worsen with age but symptoms can range from mild to severe (Iannelli, 2008).

The specific type of cerebral palsy is determined by the extent, type and location of a child's abnormalities. Classification of cerebral palsy depends on the type of movement disorder spastic (stiff muscles), athetoid (writhing movements) or ataxic (poor balance and coordination). Type of cerebral palsy is also classified affected limbs (National Institute of Neurological Disorder and Stroke, 2012). Poor growth and nutritional status are commonly reported in children with CP. Conversely, there is evidence to suggest that certain children with CP are at risk of obesity, particularly those with marked spasticity and who are relatively inactive. Poor growth is frequently considered a normal, untreatable side-effect of CP (Bell et al., 2010).

During pregnancy maternal infections have been associated with a wide variety of neurological and psychiatric disorders in the children, such as cerebral palsy, epilepsy, autism, and schizophrenia, respectively whether the risk of cerebral palsy and epilepsy in the children is related to paternal infections occurring either during pregnancy or within the five year period before pregnancy. The underlying hypothesis is that maternal infections occurring before pregnancy increases the risk of cerebral palsy and epilepsy in the children. Under the hypothesis we would expect no associations between paternal infections and the outcomes under study (Wu et al., 2013). The component of diagnosis is physical examination and medical history taking. Development and any other problem of child are assessed. Tests such as a CT scan, MRI, and ultrasound are used to find out the cause of cerebral palsy (Health Link BC, 2013). There is no cure for CP but treatment can improve the lives of those who have the condition. It is important to begin a treatment program as early as possible (Center for Disease Control and Prevention, 2012).

A multidisciplinary team approach is effective for the treatment of CP. The multidisciplinary team includes health care professionals such as pediatricians, rehabilitation specialists, neurologists and physiotherapists, occupational therapists and speech therapists. The multidisciplinary team develops an individualized treatment plan depending on the severity of cerebral palsy (Physician & Nurses, 2013). To achieve their goal strive to: 1) Help children with cerebral palsy achieve maximum physical, intellectual and emotional development 2) Educate patients, parents and the community about children with cerebral palsy 3) Develop and

promote clinical research programs that will advance the pharmacological, surgical and therapeutic treatment of cerebral palsy 4) Continue making advances in the diagnosis, management and treatment of cerebral palsy (Children's Hospital, 2013).

Cerebral palsy is not progressive disorder (Children's Hospital Colorado, 2012). Medications can lessen the tightness of muscles that is used to improve functional abilities, treat pain and manage complications related to spasticity (Myoclinic, 2013). Moreover, secondary conditions such as spasticity can get worse over time. As the spasticity continues progressive deformities of the muscles, bones and joints can occur (Children's Hospital Colorado, 2012). Some causes of cerebral palsy have been identified and cases of cerebral palsy that result from them often can be prevented. Rh disease and congenital rubella syndrome used to be important causes of cerebral palsy. Now Rh disease usually can be prevented when an Rh-negative pregnant woman receives appropriate care. Women can be tested for immunity to rubella before pregnancy and be vaccinated if they are not immune. Babies with severe jaundice can be treated with special lights which another name is phototherapy. Head injuries in babies a significant cause of cerebral palsy in the early months of life (American pregnancy association, 2013). There are various complication cerebral palsy such as cognitive impairment, blindness and hearing loss to impairment of short term memory, strabismus, language delays, learning difficulties and behavioral disorders (Ballot et al., 2012).

Cerebral palsy can range from mild to severe. Children with mild cerebral palsy may lead a near-normal life with appropriate treatment. Children with severe symptoms require life-long care. The child may or may not be able to walk, speak and self-care. Proper care and treatment can maximize the child's potential (Livestrong.com, 2009). Prognosis of the child depends on the level of brain damage. Cerebral Palsy can't be cured but due patients can enjoy near-normal lives if their neurological problems are properly managed (Right diagnosis, 2013).

3.1 Study design

Quantitative research model was used in the form of retrospective type of descriptive survey in the design. Retrospective design is the most common survey approach to focus on the past as well as present experience. Cross sectional study design was chosen because the aims of the study are to know Demography of cerebral palsy.

3.2 Study site

The study was conducted at pediatric department of CRP, Savar, Dhaka.

3.3 Study area

The study area was selected the pediatric Unit of CRP for data collection.

3.4 Sample size

Sampling procedure for cross sectional study done by following equation-

$$n = \left\{ \frac{Z \left(1 - \frac{\alpha}{2} \right)^2}{d} \right\} \times pq$$

Here,

$$Z \left(1 - \frac{\alpha}{2} \right) = 1.96$$

$$P = 0.274$$

$$q = 1 - p$$

$$d = 0.05$$

So, the aim is to focus the study by 305 samples following the calculation above initially.

But as the study was done as a part of fourth professional academic research project and there were some limitations, so for the time limitation 300 participants were as sample.

3.5 Sampling procedure

Purposive sampling technique was used for sample selection. Purposive sampling starts with a purpose in mind and the sample is thus selected to include people of interest and exclude those who do not suit the purpose. Usually, the population is too large for the attempt to survey all of its members. A small, but carefully chosen sample can be used to represent the population. The sample reflects the characteristics of the population from which it is drawn.

3.6 Inclusion criteria

- Patient with cerebral palsy who have been admitted into CRP.
- The assessment which has diagnosed.
- The complete and well fill out assessment for the necessary information.

3.7 Exclusion criteria

- Incomplete document due to lack of information.
- Undiagnosed disease.
- Cerebral palsy patient behavior problem.

3.8 Data collection and tools

Data was collected using Questionnaire, Papers, Pen, Pencil, and File.

3.9 Data analysis

Descriptive statistics was used for data analysis. Use the graph technique for analyzing data, calculated as percentages, and presented this using bar, column, table and pie charts by SPSS software version 16.0.

SPSS is a comprehensive and flexible statistical analysis and data management solution. SPSS can take data from almost any type of file and use them to generate tabulated reports, charts, and plots of distributions and trends, descriptive statistics, and conduct complex statistical analyses.

3.10 Ethical consideration

A research proposal was submitted to the physiotherapy department of BHPI for approval and the proposal was approved by the faculty members. Beginning the data collection, permission was obtained from the concerned authorities ensuring the safety of the participants. The formal permission was taken from the head of the physiotherapy Dept. to check patient file and collect the data. Data collection was started and completed within the allocated time frame. All information was kept in secure. World Health Organization (WHO) and Bangladesh Medical and Research Council (BMRC) rules were followed to conduct the study.

3.11 Limitations

Complete accuracy is not possible in any research so that some limitation may exist. Regarding this study, there were some limitations or barriers to consider the result of the study as below:

- The samples were collected only from the selected area at Centre for the Rehabilitation of the paralyzed (CRP). So the result of the study could not be generalized to the whole population in Bangladesh.
- The research project was done by an undergraduate student and it was first research project for her. So the limited experience with techniques and strategies in term of the practical aspects of research. As it was the first survey of the researcher so might be there were some mistakes that overlooked by the supervisor and the honorable teacher.

Age group

The study was conducted on 300 participants. Out of the participants mean age of the participant was 3.65 (± 2.346) years. The range is 9 with minimum age 1 years and maximum 10 years. Among the participants highest number of the participants was at the age of 2 and the number was 67(22.3%).

Among them 59.33 % were 1-3 years, 27.33% were 4-6 years and 13.33% were 7-10 years.

Age	Number (n)	Percent
1-3	178	59.3
4-6	82	27.3
7-10	40	13.3
Total	300	99.9

Table-1: Age of the participants

Gender

The pie chart shows that 300 subjects were used for this survey. Among them male were 64% (n=192) and female were 36% (n=108).

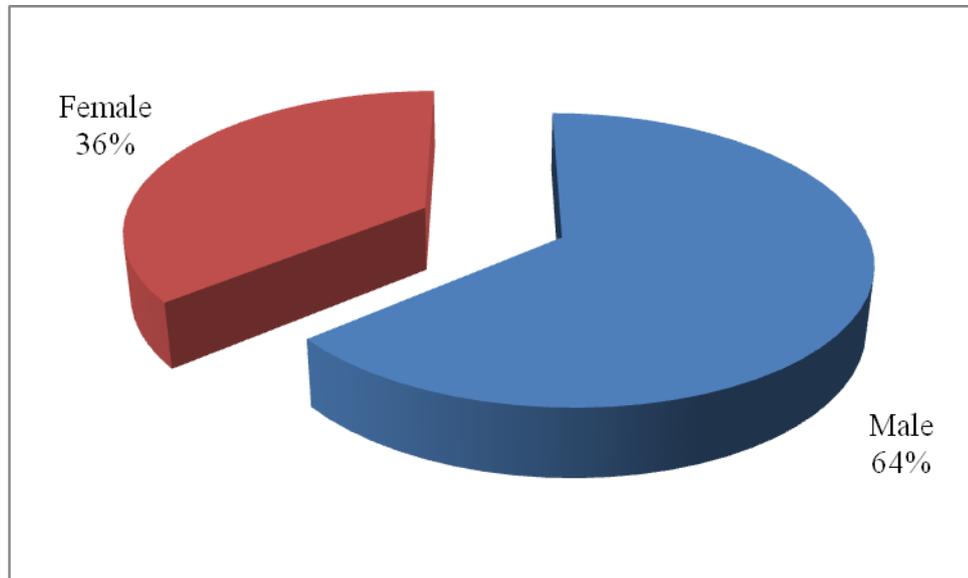


Figure-1: Gender of the participants

Age and Gender of the participants

Among the 300 participants 138 participants were male and 78 participants were female below or upto 5 years age group, 54 were male and 30 were female above 5 years age group. There mean age $3.65(\pm 2.346)$ years and minimum age was 1 years and maximum age was 10 years. In percentage 178 (59.33%) participants were between 1-3 years, 82(27.33%) were between 4-6 years, 40(13.33%) were between 7-10 years. Overall 72% participants were below or upto 5 years age group and 28% participants were above 5 years age group where 64% participants were male and 36% participants were female.

Age group	Gender of the participants		Total
	Male (%)	Female (%)	
< 5 years	138 (46%)	78(26%)	216 (72%)
\geq 5 years	54(18%)	30(10%)	84 (28%)
Total	192 (64%)	108 (36%)	300 (100%)

Table-2: Cross table of the Age and Gender of the participants

Cousin marriage

Analysis showed that among 300 participants 16.7% (n=50) parents had cousin marriage and 83.3% (n=250) had not.

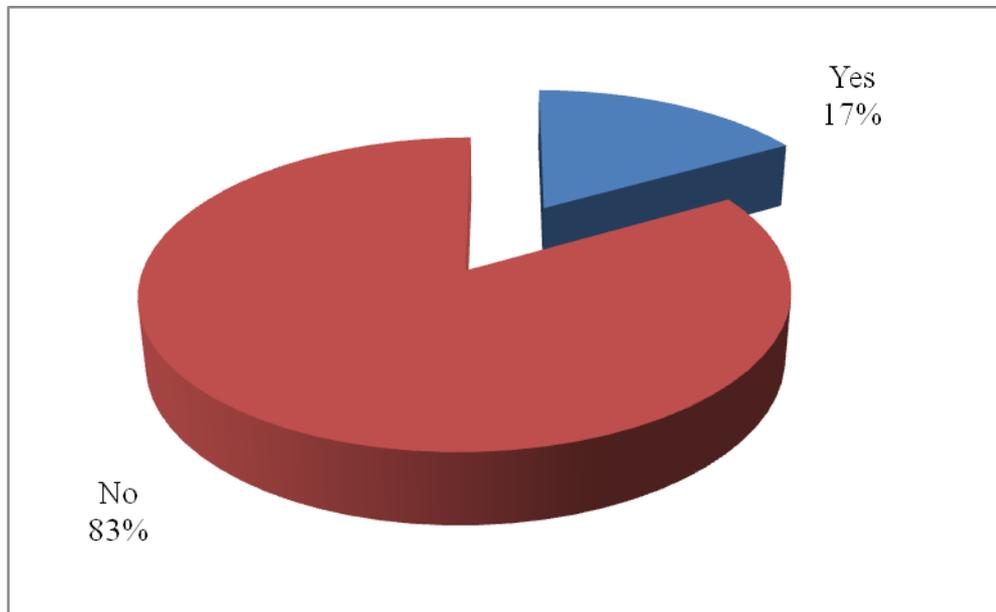


Figure-2:Cousin Marriage of the participant's parents

Mother's health

Among the 300 participants, 89% (n=267) mother's had good healthstatus and 11% (n=33) had fair.

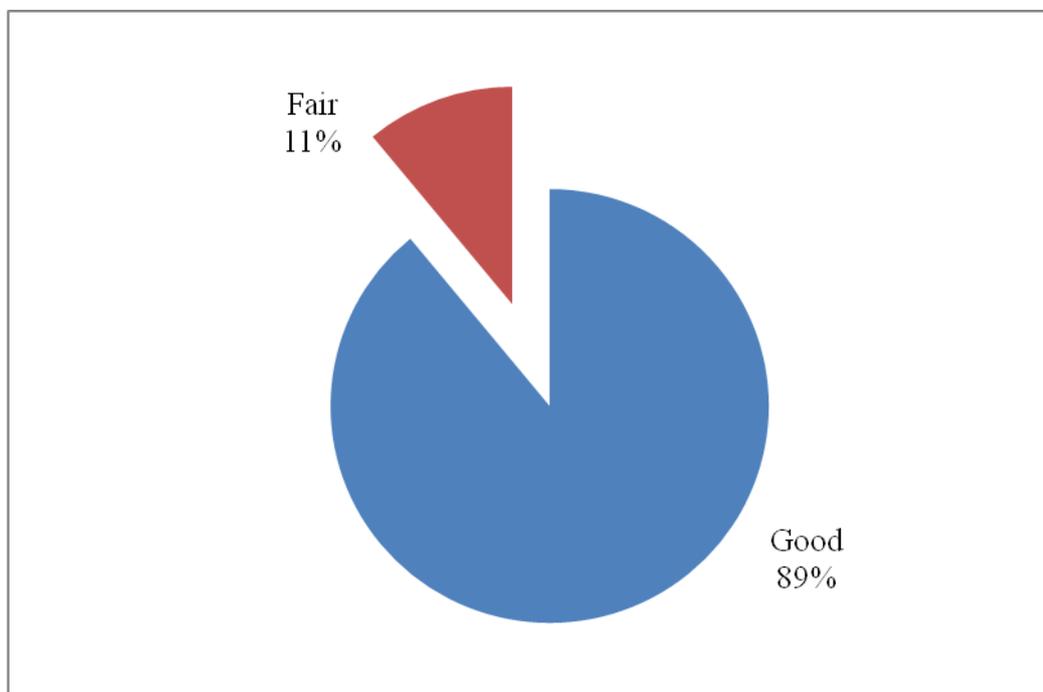


Figure-3: Mother's health

Father's health

Out of 300 participants 84% (n=254) father's had good health status and 15% (n=45) had fair.

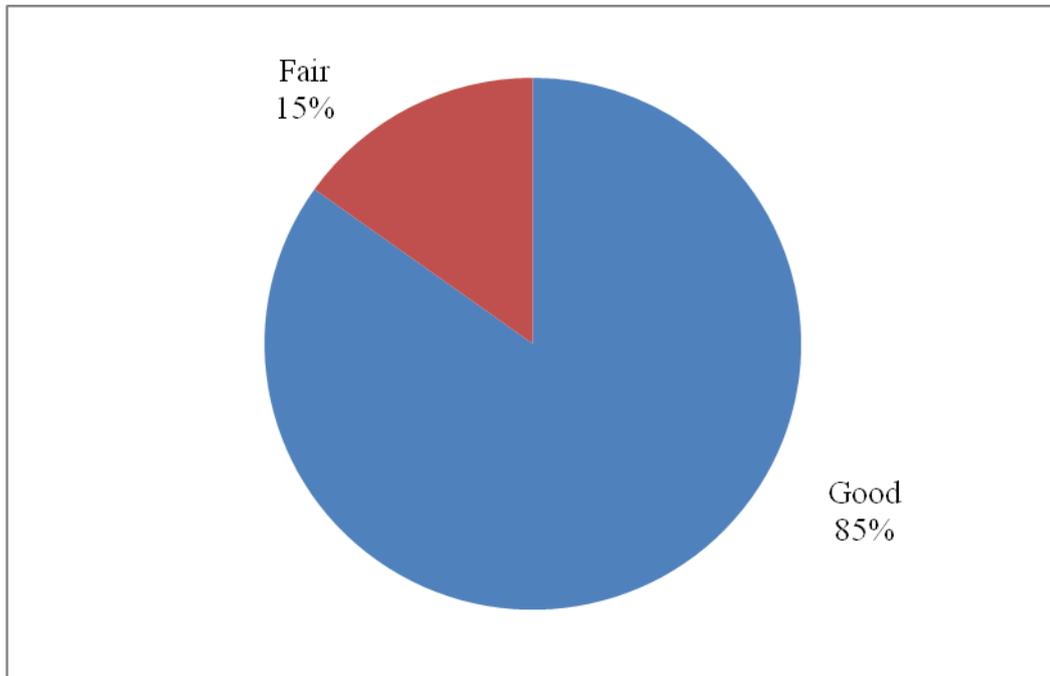


Figure-4: Father's health

Mother's educational level

According to studies mother's educational level was under primary 7.7% (n=23), Primary completed 28.3% (n=85), J.S.C completed 22.3% (n=67), S.S.C completed 14.7% (n=44), H.S.C completed 8.7% (n=26), Bachelor or above completed 4.7% (n=14), other's completed 13.3% (n=40).

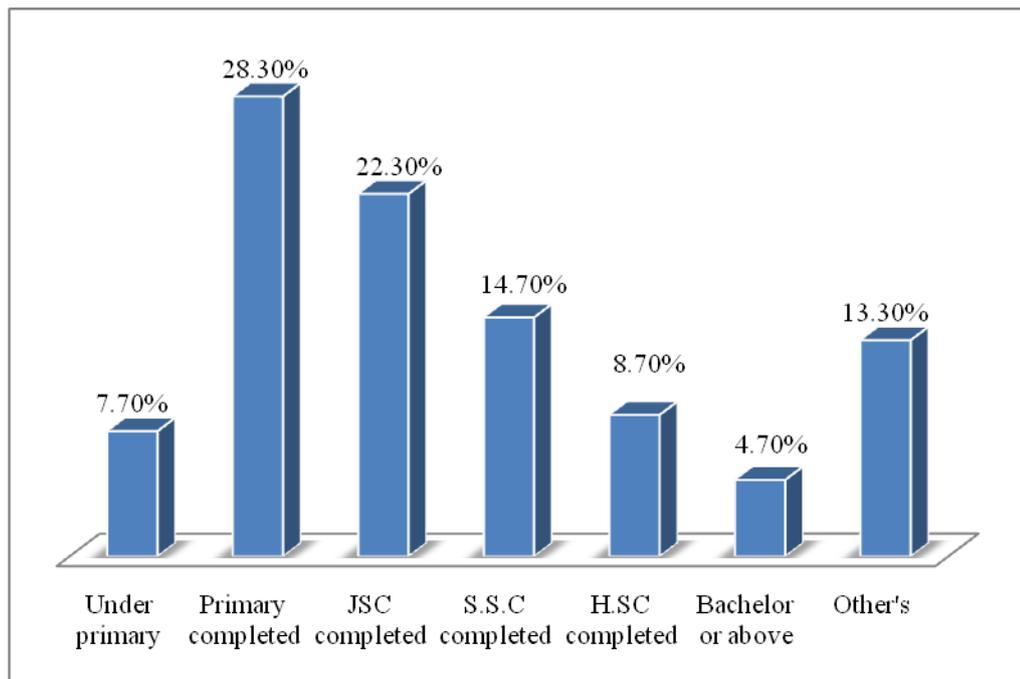


Figure-5: Mother's educational level

Father's educational level

According to studies father's educational level was under primary 4.7% (n=14), Primary completed 27% (n=27), J.S.C completed 13.7% (n=41), S.S.C completed 13% (n=39), H.S.C completed 11% (n=33), Bachelor or above completed 13% (n=39), other's completed 17.7% (n=53) among 300 participants.

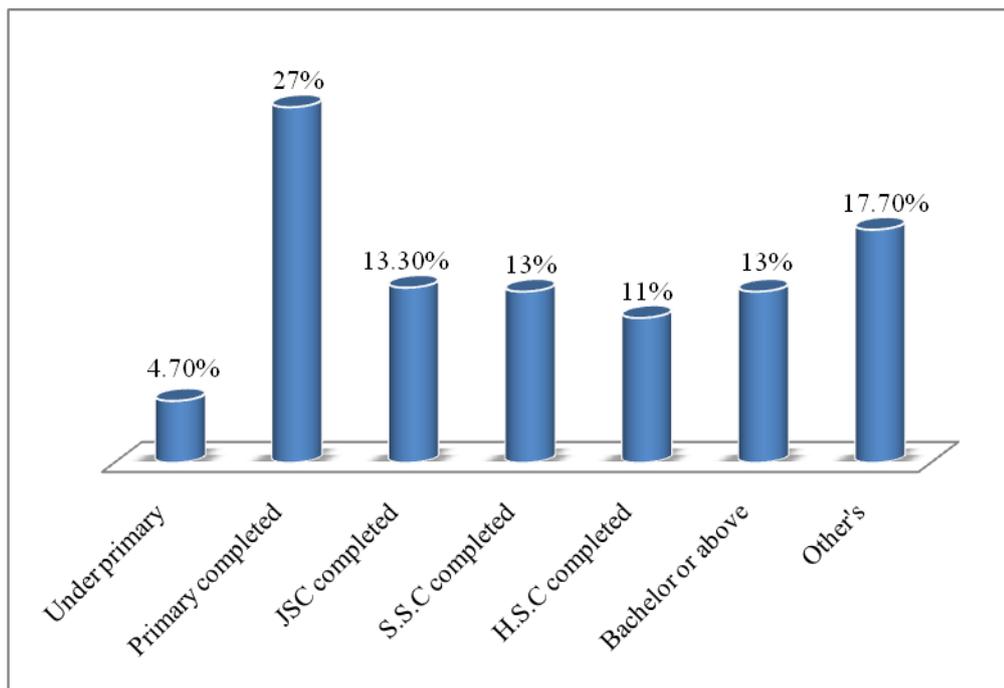


Figure-6: Father's educational level

Mother's occupation

The study was conducted on 300 participants. Out of 300 participants most of them were housewives 96.3% (n=289), and others were service holder 3.7% (n=11).

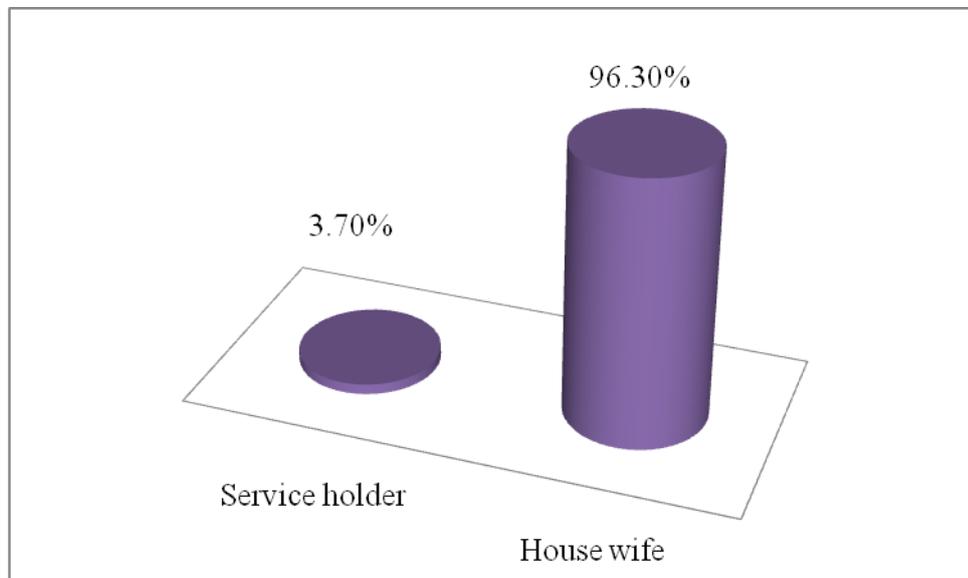


Figure-7: Mother's occupation

Number of the child

Analysis showed that among 300 participants of number of child of the patient's parents 46% (n=138) were one, 31% (n=93) were two, 16.7% (n=50) were three and 6.3% (n=19) were more than three.

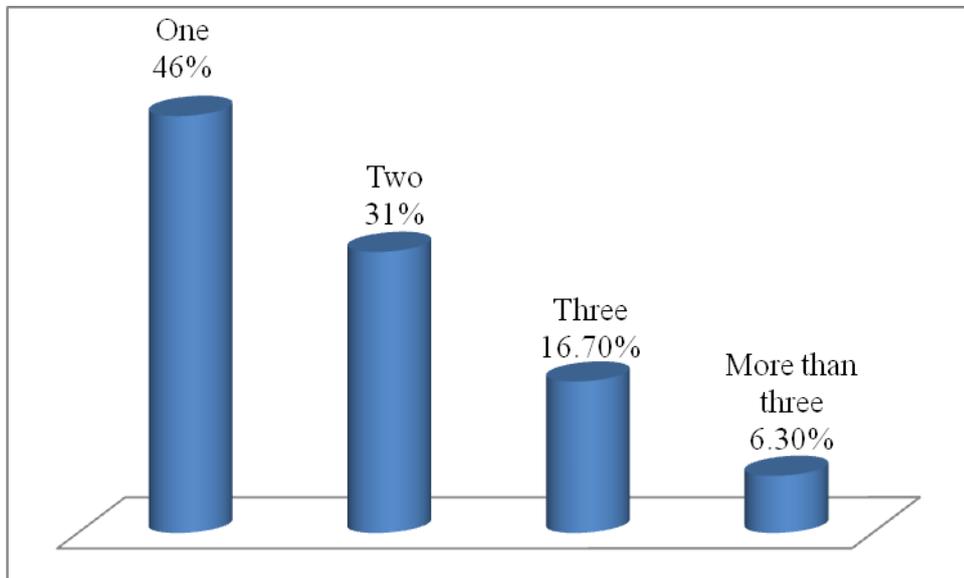


Figure-8: Number of the child of the Participant's parents

Birth history

The study was conducted on 300 participants. Out of participants 300, 22.7% (n=68) were Preterm (< 37 weeks), 76% (n=228) were Term (37 weeks) and 1.3% (n=4) were Post-term (> 37 weeks).

Birth History	Frequency
Pre term	68 (22.7%)
Term	228 (76%)
Post term	4 (1.3%)
Total	300 (100%)

Table-3: Birth history of the participants

History of delivery

37.3% (n=112) delivery attended by Doctor, 15.7% (n=47) Nurse, and 47% (n=141) Midwife out of 300 participants in this study.

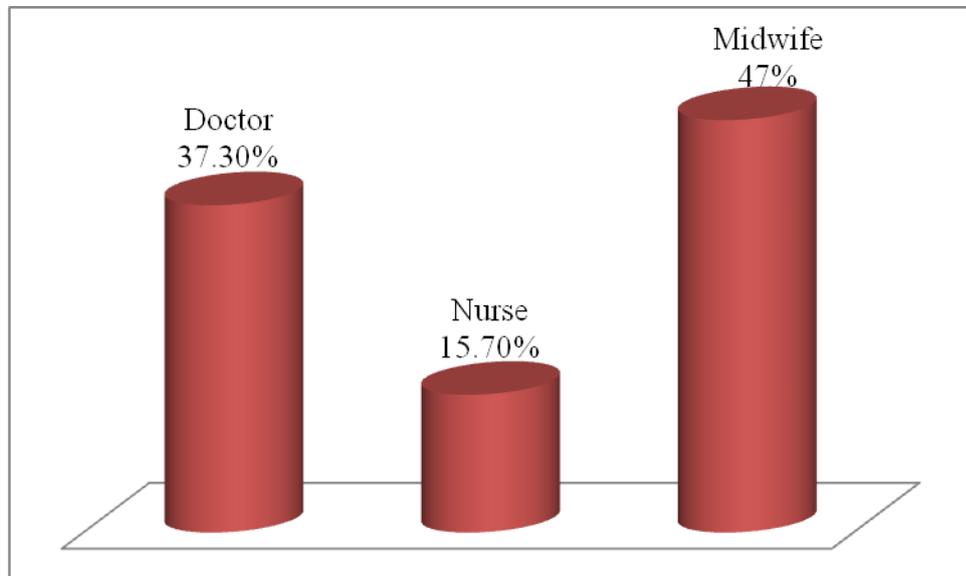


Figure-9: Delivery of the birth of the Participant's attended

Mother's complication during pregnancy

This study showed that 6.7% (n=20) mother had High blood pressure, 10.7% (n=32) had Anaemia, 10.7% (n=32) had fluid loss, 22.7% (n=68) had other illness, 48% (n=144) had Nil 0.7% (n=2) had Anaemia and other illness, and 0.3% (n=1) had Anemia and fluid loss.

Mother's complication	Frequency	Percentages
High blood pressure	21	7%
Anaemia	32	10.7%
Fluid loss	32	10.7%
Other illness	68	22.7%
Nil	144	48%
Anaemia and other illness	2	0.7%
Anaemia and fluid loss	1	0.3%
Total	300	100%

Table-4: Mother's complication of during pregnancy

Mother's labor period

Among 300 participants, 62.7% (n=188) mother had prolonged labor, 32.3% (n=97) had short labor and 5% (n=15) had sudden birth.

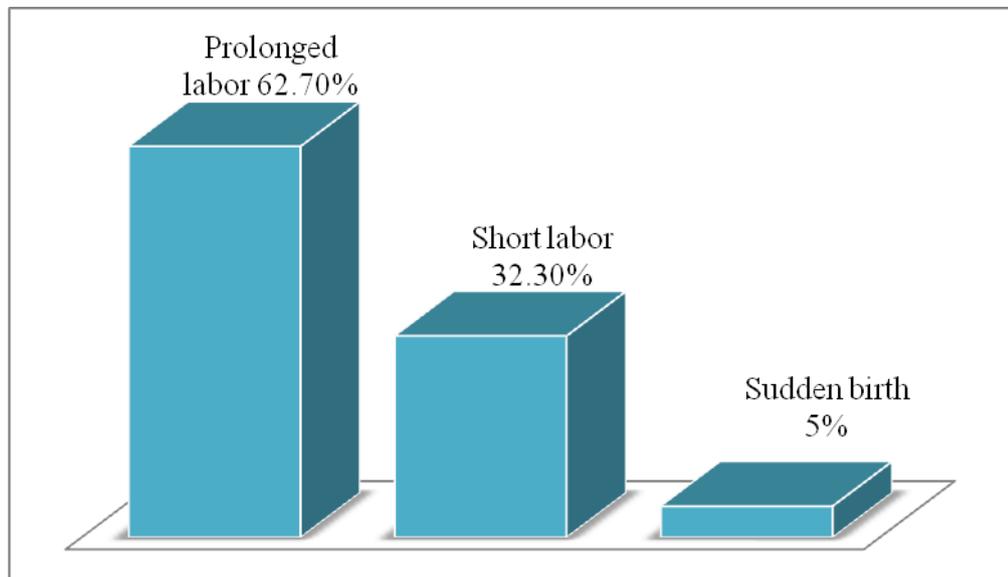


Figure-10: Mother's labor period

Birth injury

Out of 300 participants, birth injury of the participants 31.7% (n=90) had present and 68.3% (n=205) had absent.

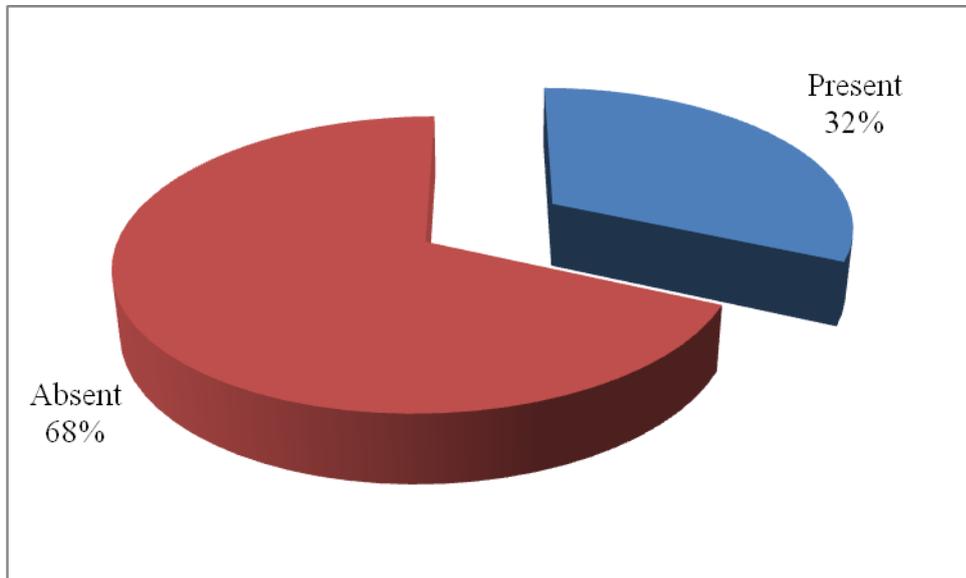


Figure-11: Birth injury of the participants

Gender and Birth injury of the participants

Among the 300 participants 63 were male and 32 were female had present birth injury during birth where 129 were male and 76 were female participants had not any birth injury.

Birth injury	Gender of the participants		Total
	Male (%)	Female (%)	
Present	63 (21)	32 (10.6)	95 (31.6)
Absent	129 (43)	76 (25.3)	205 (68.3)
Total	192 (64)	108 (36)	300 (100)

Table-5: Cross table of the Gender and Birth injury of the participants

Birth asphyxia

Out of 300 participants, 70.3% (n=211) birth asphyxia had present and 29.7% (n=89) had not.

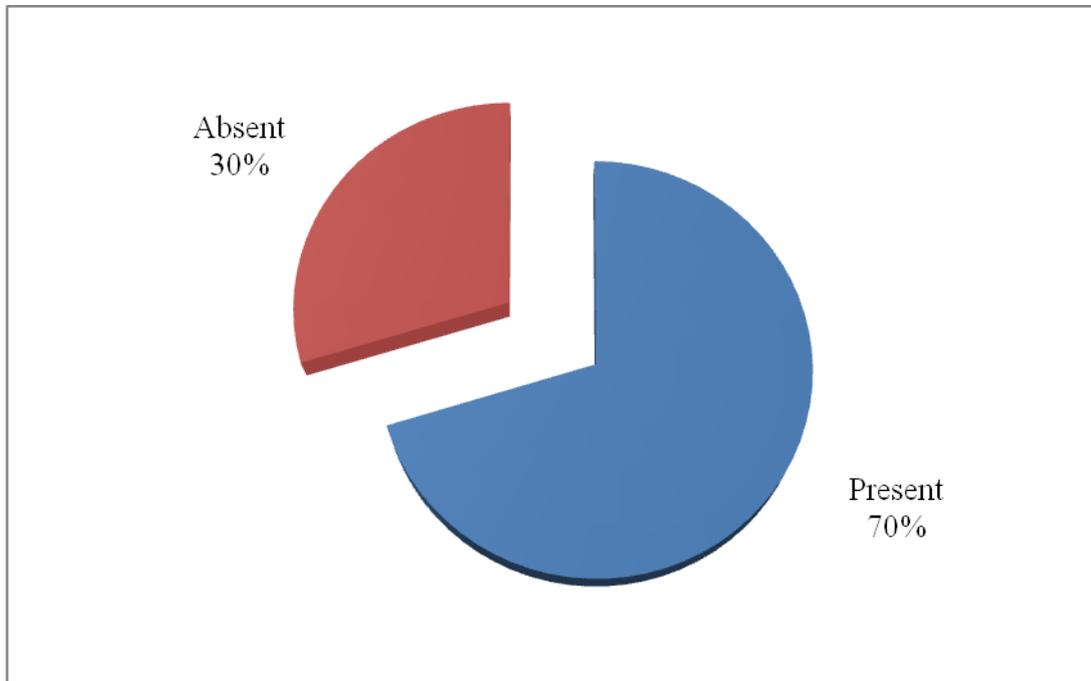


Figure-12: Birth asphyxia of the participants

Gender and Birth asphyxia of the participants

Among the 300 participants, birth asphyxia was present in 43.3% male and 27% female, whether birth asphyxia absent in 20.7% male and 9% female.

Birth asphyxia	Gender of the participants		Total
	Male (%)	Female (%)	
Present	130 (43.3)	81 (27)	211 (70.3)
Absent	62 (20.7)	27 (9)	89 (29.7)
Total	192 (64)	108 (36)	300 (100)

Table-6: Cross table of the Gender and Birth asphyxia of the participants

Duration until participants cried

The figure showing duration until participants cried. Just birth-30 minute had 71% (n=213), 31 minute-1hour had 18% (n=54), and more than 1 hour had 11% (n=33) among 300 participants.

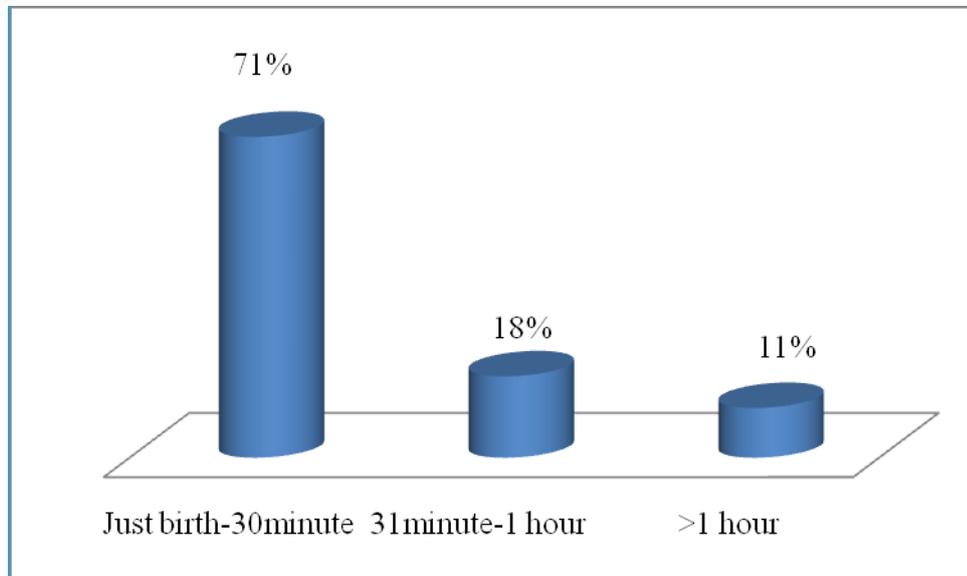


Figure-13: Duration until participants cried

Complication after birth

Analysis showed that after birth 10.7% (n=32) child developed jaundice, 1.3% (n=4) developed dehydration, 12.3% (n=37) developed pneumonia, 23.3% (n=70) developed seizure, 6.7% (n=20) developed others 10.3% (n=31) had nil, 3.0% (n=9) developed dehydration and seizure, 11% (n=33) developed jaundice and seizure, 6.7% (n=20) developed jaundice, pneumonia and seizure, 10.3% (n=31) developed pneumonia and seizure, 4% (n=12) developed jaundice and pneumonia and 0.3% (n=1) developed jaundice, dehydration and pneumonia among 300 participants.

Complications	Frequency	Percentage
Jaundice	32	10.7%
Dehydration	4	1.3%
Pneumonia	37	12.3%
Seizure	70	23.3%
Others	20	6.7%
Nil	31	10.3%
Dehydration and Seizure	9	3%
Jaundice and Seizure	33	11%
Jaundice, Pneumonia and Seizure	20	6.7%
Pneumonia and Seizure	31	10.3%
Jaundice and Pneumonia	12	4%
Jaundice, Dehydration and Pneumonia	1	0.3%
Total	300	99.9%

Table-7: Complication after birth

The aim of the study was to find out the demography of the cerebral palsy patient who admitted into CRP from July-December, 2012. Even it is not possible to know the total number of patient of cerebral palsy in Bangladesh. Currently there is lack of survey information on cerebral palsy in CRP. In this study there was about 300 samples was taken.

In this study the mean age was 3.65 years and standard deviation was 2.346. In other study conduct in America, the mean age was 4.5 (\pm 0.8) years (Allah et al., 2012). In the study we found that there were 64% male and 36% female. In other hand one study showed that there was 54.9% male and 45.1% female in total population in Australia (Davis et al., 2009). In America, other study showed from total population that, there was 60% male and 40% female. In Bangladesh, only male was 69 % in living area (Mobarak et al., 2000). In India, 55.3% was male and 44.7% was female living the residential area (Souza et al., 2005).

The study showed that maximum mother was not highly educated because of their poor financial condition. Mother's educational level were 7.7% under primary level, 28.3% primary completed, 22.3% J.S.C completed, 14.7% S.S.C completed, 8.7% H.S.C completed, 4.7% bachelor or above and 13.3% others. Another way father's educational level were completed 4.7% under primary, 27% primary, 13.7% J.S.C, 13% S.S.C, 11% H.S.C, 13% bachelor or above and 17.7% others. At the same time we saw another study in U.S.A mother's education was 6.7% H.S.C completed (Hwang et al., 2011). In Australia, one study found in mothers were completed 1.5% primary level, 37.2% high school level, 22.1% trade certification and 29% university. And father's education was 0.5% primary school, 39.2% high school, 29.4% trade certification, 23% university level completed (Davis et al., 2009). In Bangladesh, mother was not educated 38% found one study (Mobarak et al., 2000).

Most of the mothers were housewives which was 96.3% whereas only 3.7% were service holder. In other hand in America, working caregiver was 38% and not-working caregiver 62% (Allah et al., 2012). Participant's parents had number of child

one 46%, two 31%, three 16.7% and more than three 6.3% in this study. In American journal showed a study that was one-two 32%, three-four 36%, more than five 32% number of children (Allah et al., 2012).

In this study, 70.3% of the participants suffered birth asphyxia where 29.7% did not. At the same time in India, showed the study birth asphyxia was present 26.3% (Souza et al., 2005). In Netherlands study showed that 17.3% child had birth asphyxia present (Toorn et al., 2007). The study showed that after birth various complication in participants. There were pneumonia 12.3%, seizure 23.3%, jaundice 10.7%, dehydration 1.3%, others 6.7%, nil 10.3%, dehydration & seizure 3%, jaundice & seizure 11%, jaundice, pneumonia & seizure 6.7%, pneumonia & seizure 10.3%, jaundice & pneumonia 4% and last jaundice dehydration & pneumonia 0.3%. In India, the study presented that presence of neonatal seizure 7.9% (Souza et al., 2005).

CHAPTER-VI:CONCLUSION AND RECOMMENDATIONS

6.1 Conclusion

Bangladesh is a developing country among the third world. The rate of education is very low. Besides government and non-government activities in health sector are not sufficient for the people live in here. Cerebral palsy is a common condition in Bangladesh. But most of the people in this country are not aware about the Cerebral palsy. But in the developed countries physiotherapy is considered as an important treatment for the Cerebral palsy children. As developing medical profession, it is the duty of physiotherapist working in the Bangladesh should make some strong evidence, which will improve strength and skill for the physiotherapist practice. This study was aimed to find out the demography of the Cerebral Palsy patient. For the fulfillment of the study the researcher was designed a quantitative and retrospective study design and collected 300 data from the samples through a standard questionnaire from the registered unit of Pediatrics. From the data base, it was found that the age range between 1-9years is more vulnerable to have cerebral palsy. Male are pre-dominantly more affected than female. The educational level were very poor in most the patients parents, and most of them are from rural areas. It is difficult to stop the responsible cause of Cerebral Palsy. Cerebral Palsy management is a long time process so it is important to create awareness and receive proper step to reduce the risk of Cerebral Palsy.

6.2 Recommendations

The aim of the study was to find out the demography of the cerebral palsy in Bangladesh and the result which found from the study has fulfilled the aim of this research project. The following recommendations are:

- Should take more samples for generating the result and try to make more valid and reliable.
- Should take more samples for pilot study to establish the accuracy of the questionnaire.
- But research would need to be carried out considering proof of hypothesis; the method should be changed from cross sectional to case control.
- Sample should collect from the only pediatric unit in CRP in Bangladesh.

This is an undergraduate study and doing the same study at graduate level will give more accurate output. There was some limitation of the study mentioned at relevant section. It is recommended to overcome those limitations during further study.

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APPENDIX

Questionnaire

Title: “The Demographic profile of Cerebral Palsy: A retrospective study”

Part-1: Socio-demographic in information	
1.1	Patient name:
1.2	Date of admission:
1.3	Date of data collection:
1.4	Address: House number /vill: P.O: P.S: Dist:
1.5	Contact number:

Part 2: Sample related information

QN	Questions and filters	Response
2.1	Age (in year) Years
2.2	Sex:	1= Male 2= Female
2.3	Do you have cousin marriage?	1= Yes 2= No
2.4	Mother's health	1= Good 2= Fair
2.5	Father's health	1= Good 2= Fair
2.6	Mother's educational level:	1=Under primary 2= Primary completed 3= J.S.C completed 4= S.S.C completed 5= H.S.C completed 6= Bachelor or above 7= Other (Specify):
2.7	Father's education level:	1= Under primary. 2= Primary completed 3= JSC complete. 4= S.S.C completed. 5= H.S.C completed 6= Bachelor or above 7= Other (Specify):
2.8	Mother's occupation	1= Service holder 2= Housewife

QN	Questions and filters	Response
2.9	Number of child:	1= One 2= Two 3= Three 4= More than three
2.10	If more than one is there any disability present?	1= Yes 2= No
2.11	Birth history	1= Premature 2= Term 3= Post-term
2.12	Delivery of birth is attended by	1= Doctor 2= Nurse 3= Midwife
2.13	During pregnancy, any history of	1= High blood pressure 2= Anemia 3= Other illness 4= Fluid loss 5= Nil 6= Anemia and other illness 7= Anemia and fluid loss
2.14	During birth time	1= Prolonged labor 2= Short labor. 3= Sudden birth
2.15	Birth injury	1= Present 2= Absent
2.16	Birth asphyxia	1= Present 2= Absent
2.17	Minutes until baby cried	1= After birth- 30 minute 2= 30 minute- 1 hour 3= More than1 hour
2.18	After birth any complication	1= Jaundice 2= Dehydration

		3= Pneumonia 4= Seizures 5= Others 6= Nil 7= Dehydration and Seizures 8= Jaundice and Seizures 9= Jaundice, Pneumonia and Seizures 10= Pneumonia and Seizures 11= Jaundice and Pneumonia
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