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Birth Characteristics of Dyskinetic Cerebral Palsy Children in Dhaka City: A Cross-sectional Study

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

"Birth Characteristics of Dyskinetic Cerebral Palsy in Children of Dhaka City: A Cross-sectional Study"

Submitted by **Sakia Billah Mim** for the partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B.Sc. in PT)

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LIST OF ACRONYMS

ADLs	Activity of Daily Living
FBDCH	Firoza Bari Disabled Children Hospital
BSc	Bachelor of Science
CFCS	Communication Function Classification System
CP	Cerebral Palsy
DCP	Dyskinetic Cerebral Palsy
MACS	Manual Ability Classification System
MSc	Master of Science
SPSS	Statistical Package for Social Science
WHO	World Health Organization

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ABSTRACT

Background: Dyskinetic cerebral palsy is one type of CP which is caused by damage to the basal ganglia, a part of the brain involved in movement control. Dyskinetic cerebral palsy (DCP) is the second most common type of cerebral palsy after spastic forms. **Objectives:** To determine the birth characteristics of dyskinetic cerebral palsy among the children at FBDCH in Dhaka city. **Results:** Among fifty-nine dyskinetic cerebral palsy patients, the mean age of the patients was 4.15 (SD = ± 2.37). Among them 61% were male and 39% were female in gender. Among the respondents most of them were mothers. Among the participants, the majority of children (49.2%) were born between 28 and 37 weeks of gestation age. Regarding frequency distribution of the children crying after birth, it was found that 39 (66.1%) children did not cry immediately after birth, whereas 20 (33.9%) cried soon after delivery. The most common clinical signs and symptoms were poor feeding or dysphagia (30.5%, n=18), followed by sleep and respiratory problems (20.3%, n=12). Other symptoms included constipation (6.8%, n=4), pain (3.4%, n=2), and miscellaneous issues (15.3%, n=9). Among the participants, 35.6% had spastic bilateral cerebral palsy, 32.2% had spastic unilateral cerebral palsy, 18.6% had spastic quadriplegia, and 13.6% had spastic diplegia. Spastic bilateral CP was the most prevalent type. Among the participants, 66.1% (n=39) had physical abnormalities noticed at birth, while 33.9% (n=20) showed no such abnormalities. The data revealed that 79.7% (n=47) of children were suffering from epilepsy, while 20.3% (n=12) were not. The study highlights the association between child pregnancy period, labour presentation, epilepsy, disease during pregnancy, types of suffering and types of DCP. **Conclusion:** In this research, among the participants, half of the children were born between 28 - 37 weeks of gestation age and most of the children had epilepsy. This study showed that health care facilities should be provided to DCP to maintain and improve their daily living function to enhance their ability. Medical consultancy, term and hospital delivery, education, awareness about child disability and its prevention, and ensuring women's rights and improvements in antenatal, obstetric, and neonatal care can prevent DCP.

Key words: *Cerebral palsy, Dyskinetic cerebral palsy, Quality of life, Activity of daily living.*

CHAPTER- I INTRODUCTION

1.1 Background

Dyskinetic cerebral palsy is characterized by involuntary, uncontrolled, recurring and occasionally stereotyped movements in which the primitive reflex patterns predominate and muscle tone varies (Park et al. 2014, p. 189).

In Europe, the incidence of dyskinetic CP rose from 0.08 per 1,000 live births in the 1970s to 0.14 in the 1990s. Specifically, in western Sweden, the prevalence of dyskinetic CP increased from 0.14 per 1,000 live births in 1976 to 0.25 in 2005, although a decrease was noted in 2010 (Evensen et al. 2023, p. 1464).

The primary causes of dyskinesia in children are bilirubin encephalopathy and hypoxic ischemic brain injury, which result in selective damage to the basal ganglia.
Because the excitatory glutamatergic pathways into the putamen and thalamus are overactive in severe hypoxic-ischemic encephalopathy, near-total perinatal asphyxia results in selective lesions in these regions. However, the globus pallidus may be protected because inhibitory neuronal activity silences its activity. On the other hand, the globus pallidus may be more susceptible to milder, subacute oxidative stressors from hereditary mitochondrial diseases or from mitochondrial poisons like bilirubin due to its comparatively high resting neural activity (Hou et al. 2006, p. 23).

The second most common kind of cerebral palsy is dyskinetic cerebral palsy (DCP), which is prevalent in both term and normal-weight babies. Although it is generally acknowledged that DCP has worse gross motor function than other forms of CP, there is less empirical proof that it also has worse cognitive ability, particularly when the severity of gross motor impairments is equal across groups. The hallmarks of dyskinetic cerebral palsy include uncontrollable, repetitive, involuntary, and even stereotyped motions. Muscle tone varies, primitive reflex patterns are predominant, and dyskinesia is distinguished from dystonia (Hoyos et al 2019, p. 546).

Involuntary, uncontrollable, repetitive movements with varying muscle tone are the hallmarks of dyskinetic cerebral palsy (CP); it is further subdivided into choreoathetosis and dystonia. Although choreoathetosis and dystonia frequently coexist, dystonia is

more prevalent and frequently categorized. It is becoming more well acknowledged that certain children exhibit a mixed motor type, which includes both spasticity and dystonia and/or choreoathetosis.It has been noted that children with major dyskinetic motor types and mixed (dyskinetic/spastic) motor types are both at risk for pain; therefore, it is necessary to investigate the nature of pain in these two significant subgroups (McKinnon et al. 2020, p. 1294).

Dyskinetic cerebral palsy (DCP) ranks as the second most common type, following spastic variants. The etiology of DCP is generally linked to non-progressive lesions affecting the basal ganglia, thalamus, or both structures, leading to atypical postures or movements that are associated with difficulties in tone regulation and movement coordination. In cases of DCP, the coexistence of two primary movement disorders dystonia and choreoathetosis is frequently observed. Dystonia tends to be more severe and impactful than choreoathetosis, significantly influencing daily functioning, quality of life, and participation in society. The underlying mechanisms of these movement disorders remain largely elusive. Current hypotheses suggest potential factors such as an imbalance in the indirect and direct pathways of the basal ganglia, disrupted sensory processing, and compromised plasticity within these brain structures. Rehabilitation approaches for DCP are typically multidisciplinary in nature. The administration of oral medications aimed at alleviating symptoms of the movement disorders is often constrained by side effects and a lack of robust evidence supporting their efficacy. However, neuromodulation techniques, including intrathecal baclofen and deep brain stimulation, show promise as viable treatment options (Monbaliu et al.2017, p. 741).

One of the most incapacitating types of cerebral palsy (CP) is dyskinetic CP, which is the second largest group of CP. Both dystonia and choreoathetosis are typically present at the same time and can be characterized by their amplitude and duration as well as their context, which can include movements and postures, rest and activity, or specific tasks (Monbaliu et al. 2016, p. 138).

One of the most severe types of cerebral palsy is dyskinetic CP. Changes in posture and muscle tone, along with a variable component of involuntary movement, are the hallmarks of this motor illness. Dyskinetic CP can be further divided into the dystonic and choreoathetosis subgroups since it is dependent on the prevalence of either condition. When the prevalence of dystonia and choreoathetosis is hard to identify, the

term dyskinetic CP is used. Dystonia and choreoathetosis frequently coexist in dyskinetic CP (Burc et al. 2025, p. 146).

The variability in basal ganglia injury among these patients complicates localization efforts, as evidenced by the differing responses to medical and surgical interventions among individuals with similar dyskinetic CP phenotypes. For instance, deep brain stimulation targeting the globus pallidus interna (GPi-DBS) in dyskinetic CP patients typically results in a mean improvement of 30% to 40% in the Burke-Fahn-Marsden motor score; however, 40% of patients experience no motor improvement. Currently, there is no established method to identify which CP patients are likely to benefit from GPi-DBS. and those with a low likelihood of symptomatic improvement (Aravamuthan et al. 2016, p. 12).

Dyskinetic cerebral palsy (CP) represents the second most prevalent subtype, impacting approximately 10-20% of children diagnosed with CP. In certain instances, spasticity and dyskinesia may occur simultaneously, necessitating classification based on the predominant condition. Research suggests that individuals with dyskinetic CP often experience more severe motor impairments and higher rates of intellectual disability compared to those with other subtypes. The etiology of dyskinetic CP is diverse, yet it is typically observed in term infants who have experienced significant peri- or neonatal complications, resulting in a characteristic pattern of brain injury. This subtype is particularly noteworthy due to the presence of modifiable factors associated with neonatal care and various treatment modalities, in contrast to the more commonly encountered spastic CP. Treatment strategies vary, with neuromodulatory approaches such as intrathecal baclofen and deep brain stimulation showing promise. Neuroimaging frequently reveals lesions in the basal ganglia and thalamus, often accompanied by cortical damage; however, recent investigations have also identified additional findings, including white matter injury (Preel et al. 2019, p. 1850).

Dyskinetic cerebral palsy (DCP) represents one of the most debilitating forms of cerebral palsy (CP). It ranks as the second most prevalent type of CP, following spastic CP, and accounts for approximately 6–15% of all CP cases (Monbaliu et al. 2017, p. 741).

Various insults to the nervous system, including perinatal hypoxia-ischemia, neonatal

hyperbilirubinemia, developmental brain malformations, central nervous system infections, and intracranial vascular incidents impacting the basal ganglia, can lead to the development of DCP (Monbaliu et al. 2017, p. 741).

In developing nations, a considerable number of DCP cases are attributed to neonatal hyperbilirubinemia. Conversely, kernicterus resulting from bilirubin encephalopathy has become increasingly rare in developed countries, thanks to advancements in neonatal care, timely jaundice detection, and improved management of Rh isoimmunization (Himmelmann et al. 2019, p. 2048).

While the brain injury associated with CP is non-progressive, the resulting motor impairments and associated comorbidities significantly impact functional abilities and overall quality of life. More than half of children diagnosed with DCP are non-ambulatory and experience severe learning disabilities and epilepsy (Himmelmann et al. 2009, p. 921).

There is a notable scarcity of literature addressing the patterns of comorbidities in children with DCP from developing countries. Unlike nations such as Sweden or Norway, which maintain national CP registries, most developing countries lack such comprehensive data . As a result, DCP has primarily been examined as a subset of CP within center-based cohorts (Saini et al. 2024, p. 2).

To give an update on the diagnosis and treatment of DCP and to determine research objectives, we conducted a critical assessment of the literature. The clinical manifestation, treatment, and new therapeutic developments of this motor illness will be the main topics of this review (Kate Himmelmann et al. 2017, p. 741).

1.2 Justification

Dyskinetic cerebral palsy (CP) is one of the most debilitating forms of cerebral palsy. The main goal of birth characteristics of dyskinetic cerebral palsy children is to identify potential risk factors and patterns associated with the development of this neurological condition which can help in early intervention, prevention strategies and better understanding of the underlying causes by examining factors like gestational age, birth weight, epilepsy, sleep and respiratory problems, urinary and fecal incontinence, dysphagia and birth complication during delivery that might be linked to occurrence of dyskinetic cerebral palsy in children. Taking into account the classification of CP according to the type of motor involvement, dyskinetic CP is identified as a rare subtype (15% of all CP cases) (Kitai et al. 2021, p. 108) characterized by abnormal patterns of posture or movement, accompanied by involuntary, uncontrolled, recurrent and, occasionally, stereotyped movements. The importance of this study is to maintain and improve their daily living function to enhance their ability. It helps in targeting specific impairments such as muscle tone abnormalities, involuntary movements etc. This study on birth characteristics contributes to better understanding of dyskinetic cerebral palsy causes. It also encourages participation in therapy programs and medical follow-ups. Improvement of antenatal ,obstetric and neonatal care services in the health care sector that can prevent DCP.

1.3 Research question

What are the birth characteristics of Dyskinetic cerebral palsy children in Dhaka city?

1.4 Objectives

General objective

To determine the birth characteristics of Dyskinetic Cerebral Palsy among the children attending FBDCH in Dhaka City.

Specific objective

1. To identify the birth characteristics of Dyskinetic Cerebral Palsy among the children at FBDCH in Dhaka City.
2. To assess the types of Dyskinetic Cerebral Palsy among the children at FBDCH in Dhaka City.
3. To describe the socio-demographic characteristics of the children having Dyskinetic Cerebral Palsy.

1.5 Operational Definition

Birth Characteristics

Birth characteristics are statistics that describe the characteristics of a birth, such as the gestational age, birth weight, birth complications etc.

Dyskinetic Cerebral Palsy

Dyskinetic cerebral palsy is one type of CP which is caused by damage to the basal ganglia, a part of the brain involved in movement control and diagnosed by a healthcare professional.

Abruptio Placenta

Placental abruption occurs when the placenta separates from the inner wall of the uterus before birth. Placental abruption can deprive the baby of oxygen and nutrients and cause heavy bleeding in the mother. In some cases, early delivery is needed. Placental abruption often happens suddenly.

Spastic Unilateral

Spastic unilateral cerebral palsy (USCP) is a type of cerebral palsy that affects one side of the body. It's also known as spastic hemiplegia.

Spastic Bilateral

Bilateral spastic cerebral palsy (CP) is a type of cerebral palsy that causes stiffness in muscles on both sides of the body. It's also known as spastic diplegia.

Spastic Diplegic

Spastic diplegia cerebral palsy (SDCP) is a form of cerebral palsy that causes muscle stiffness and spasms in a person's legs and, sometimes, arms.

Spastic Quadriplegic

Spastic quadriplegic cerebral palsy (CP) is a permanent neuromuscular disorder causing limitation on all four limbs following a lesion on the developing brain.

NVD

Natural vaginal delivery (NVD) is the most secure and safest delivery method in the majority of cases for both the mother and the infant, while cesarean section (CS) is generally considered as an alternative when NVD is not possible to protect both the mother and infant.

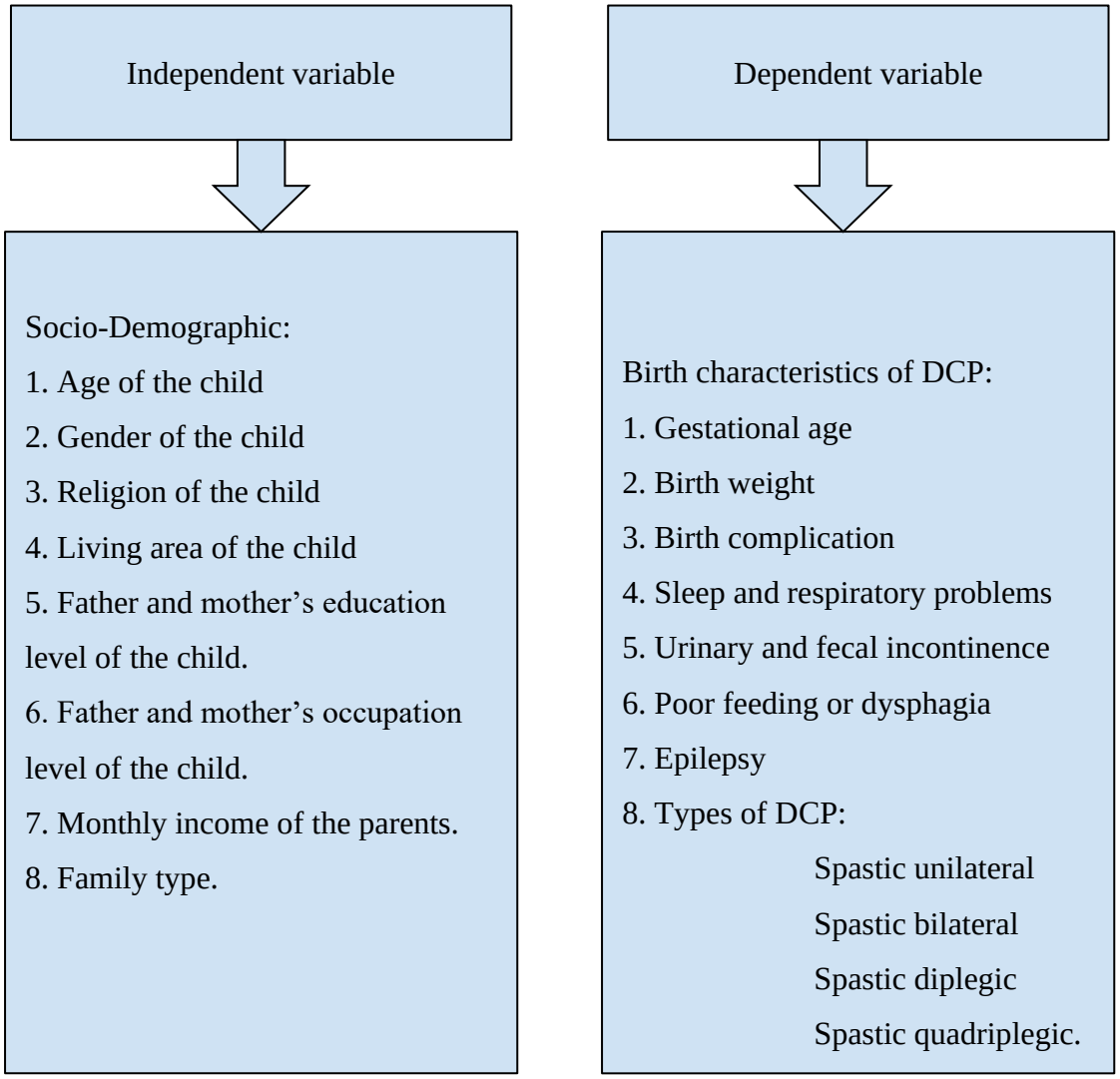
Cesarean Section

A cesarean section, also known as a C-section or cesarean birth, is a surgical procedure to deliver a baby through incisions in the mother's abdomen and uterus.

Epilepsy

Epilepsy is defined as having two or more unprovoked seizures.

1.5 Conceptual framework:



CHAPTER-II LITERATURE REVIEW

Dyskinetic cerebral palsy (DCP) ranks as the second most prevalent form of cerebral palsy, following spastic cerebral palsy, and constitutes approximately 15% of all cases. The primary contributors to DCP include perinatal hypoxic ischemic encephalopathy (HIE) and bilirubin encephalopathy (BE). Notably, the incidence of BE has diminished due to advancements in preventive measures, especially in high-income nations. Nevertheless, recent observations indicate that BE remains a significant cause of DCP in Japan, particularly among very preterm infants. (Kitai et al. 2021, p. 108).

Among Europe, cerebral palsy (CP), which affects roughly two out of every 1000 live births, is the most prevalent physically debilitating condition among children. After spastic CP (85%), dyskinetic CP is the second most frequent type, making for 6 –15% of all children with CP. Most kids with dyskinetic cerebral palsy have a lesion in either the thalamus or the basal ganglia. Motor deficits cause mobility and manual ability limits in children and young people with dyskinetic cerebral palsy. Involuntary movements and alterations in muscle tone, such as dystonia and choreoathetosis, are hallmarks of these motor disorders (Haberfehlner et al. 2020, p. 2).

Dystonia and choreoathetosis are known to be prevalent in the limbs, trunk, neck, eye, and mouth in dyskinetic cerebral palsy. The movement and posture characteristics of these phenomena are poorly understood, despite the fact that their presence is typically described in dyskinetic CP. No prior research has charted the prevalence and severity of choreoathetosis and dystonia, as well as their distribution across various body parts, both at rest and during activity. This could be due to the pathological complexity and the challenge of quantifying choreoathetosis and dystonia in dyskinetic cerebral palsy. However, a thorough comprehension of clinical patterns is essential in light of targeted treatment (Monbaliu et al. 2016, p. 138).

Over 70% of kids with dyskinetic cerebral palsy fall into the highest categories of fine motor and gross motor functional impairments. As a result, the majority of individuals with dyskinetic cerebral palsy (CP) are entirely reliant on caregiver support for passive mobility and/or use powered wheelchairs (PW) for independent mobility. Opportunities for personal mobility with the highest level of independence are seen as fundamental

human rights and are essential to a high standard of living and general well-being. Improvements in more independent mobility have been shown to have a positive impact on the cognitive, psychosocial, emotional, and perceptual development of individuals with severe motor limitations. They have also been shown to raise levels of curiosity, confidence, and motivation as well as independent exploration, activity and participation, social interaction, and play skills (Bekteshi et al. 2020, p. 118).

Since dyskinetic cerebral palsy makes up 10% of all cases of cerebral palsy, its overall incidence in Western nations is 0.15 to 0.25 cases per 1000.4. One debilitating and poorly understood sign of this illness is abnormal upper extremity motions. Excessive movement of several joints during reaching attempts is a defining characteristic. The necessary hand shape and end-point force may not be adequately managed, and reaching may overshoot or undershoot the goal. The contralateral hand frequently mimics the distal hands or fingers' movements, and intricate hand movements can highlight the opposite arm's dystonic posture (Sanger, 2006, p. 551).

The simultaneous, prolonged contraction of the agonist and antagonist muscles during movement causes aberrant muscular activation in patients with DCP, which leads to challenges in sustaining spatiotemporal trajectories and a significant degree of movement unpredictability. Athetosis, chorea, and dystonia are the most typical symptoms. These uncontrollable motions may limit or even impair upper limb function, create discomfort, and interfere with voluntary movements. Reaching, gripping, and handling impairments make it challenging to do daily tasks including eating, dressing, and maintaining personal hygiene (Artilheiro et al. 2014, p. 875).

Cerebral palsy (CP) represents the most prevalent neuromotor disorder globally, impacting approximately 2-3 out of every 1,000 children born in the United States. The spastic subtype accounts for about 85% of CP cases, while dyskinetic CP is the second most frequent subtype, affecting 15%-20% of affected children. The classification of dyskinetic CP has undergone significant changes, initially encompassing all nonspastic movement disorders associated with CP, such as dystonia, athetosis, synkinesia, ataxia, and tremor. Currently, it is defined more narrowly to include only dystonic and choreoathetoid forms. Within dyskinetic CP, dystonia is more prevalent than choreoathetosis, although both conditions often coexist and are typically generalized, frequently resistant to medical treatment. The brain damage observed in individuals

with CP is heterogeneous, with grey and white matter being vulnerable to distinct injury mechanisms. Diffuse white matter injury and periventricular leukomalacia are often linked to preterm births or moderate, prolonged hypoxic-ischemic episodes, which are associated with the emergence of spastic CP. In contrast, dyskinetic CP is correlated with injuries to the basal ganglia and thalamus resulting from brief but severe hypoxic events, and it is more frequently observed in term infants. While these models of brain injury provide a useful initial framework, there is insufficient evidence to support a specific anatomical injury pattern that predisposes individuals to dyskinetic CP (Waugh et al. 2016, p. 11).

Numerous factors can contribute to DCP, such as brain maldevelopment, intracranial hemorrhage, stroke, cerebral infection, neonatal hyperbilirubinemia, and perinatal hypoxia-ischemia in babies born close to term.During the preterm and term periods, kernicterus a condition in which bilirubin is deposited in the basal ganglia can be brought on by hyperbilirubinemia. Preventive measures have made this syndrome less prevalent in high-income nations, but it remains a significant problem in low-income nations. Postnatal surveillance is still crucial in addition to primary prevention of hyperbilirubinemia, and promising preventative strategies have been established in settings with limited resources. It is less common for causes that do not occur during the neonatal era, like cardiorespiratory arrest or near drowning throughout the first year (Himmelmann et al. 2017, p. 741).

Dyskinetic cerebral palsy (CP) is defined by the presence of involuntary, uncontrolled, and often repetitive movements, where primitive reflex patterns are predominantly observed and muscle tone fluctuates. A significant contributing factor to the development of dyskinetic CP is birth asphyxia, which results in a more uniform presentation compared to other forms of CP. The reported prevalence of dyskinetic CP ranges from 6% to 13%. Nevertheless, recent observations indicate that prevalence rates may be on the rise or remain consistent with earlier findings. The variation in reported prevalence across different studies may stem from the absence of standardized diagnostic criteria. Clinical manifestations of dyskinetic CP include dystonia, which poses challenges for quantitative assessment (Park et al. 2014, p. 190).

Dyskinetic cerebral palsy (CP) represents the second predominant subtype within the broader classification of CP. This subtype can be further divided into various categories.

However, the specific clinical features associated with these categories have not been extensively researched. The aim of this study was to explore the clinical characteristics and functional classification of dyskinetic CP, focusing on neurologic subtypes, through a hospital-based follow-up approach. This observational study involved a cohort of consecutive children diagnosed with dyskinetic CP who received treatment at The Affiliated Women & Children Hospital of Qingdao University in China, spanning from October 2005 to February 2015. Participants were categorized based on their neurologic subtype and evaluated using the Gross Motor Function Classification System (GMFCS), the Manual Ability Classification System (MACS), and the Communication Function Classification System (CFCS) (Sun et al. 2018, p. 1-2).

In contrast, less developed regions continue to experience a significant burden due to various factors, such as a high incidence of glucose-6-phosphate deficiency, late presentations following out-of-hospital births, delays in jaundice recognition, reliance on alternative treatments by caregivers, and suboptimal neonatal care . Consequently, perinatal asphyxia is identified as the primary cause of DCP in developed areas (Himmelmann et al. 2019, p. 2048).

The Surveillance of Cerebral Palsy in Europe (SCPE) categorizes CP into subtypes, including two primarily characterized by spasticity: spastic unilateral and spastic bilateral. Conversely, the International Statistical Classification of Diseases and Related Health Problems, 10th Revision (ICD-10), identifies three spastic CP subtypes: hemiplegic, diplegic, and quadriplegic, with the latter two falling under the SCPE's spastic bilateral category. In contrast, spastic quadriplegic CP shares several characteristics with dyskinetic CP and has maintained a stable prevalence of approximately 0.15 per 1,000 live births, with significant motor and associated impairments. Risk factors for both dyskinetic CP and spastic quadriplegic CP include sentinel events occurring during delivery. The rising prevalence of dyskinetic CP, alongside the stable rates of spastic quadriplegic CP at the close of the 20th century, despite notable advancements in obstetric and perinatal care, has led some researchers to suggest that these CP subtypes are predominantly of antenatal origin and are rarely preventable. An international consensus statement issued in 1998 identified dyskinetic CP and spastic quadriplegic CP as critical criteria for defining acute intrapartum events. However, perinatal health has improved and the overall prevalence of CP has continued

to decrease during the first decade of the 21st century, suggesting improved antenatal, perinatal, and neonatal care (Evensen et al. 2023, p. 1464-65).

About 2–3 percent of people had cerebral palsy, and 11.4%–15% had dyskinesia . From May 1997 to October 1998, a sampling survey conducted in six Chinese cities revealed a prevalence of cerebral palsy of 1.92‰, of which 4.63% had athetosis. This is lower than what has been documented abroad.[16] Likewise, it was noted that dyskinetic cerebral palsy was less common in other parts of China. This discrepancy stems from the diagnostic methods employed by researchers who merely got brief training, such as pediatricians, neurologists, and healthcare professionals. Nonetheless, a case study conducted at our rehabilitation facility revealed that dyskinetic cerebral palsy accounted for 19.1%–21.2% of all types, which is comparable to the 28.6% described elsewhere (Hou et al. 2006, p. 23).

CHAPTER-III METHODOLOGY

3.1 Research design

This study was a descriptive type of cross-sectional one carried out with the objective of determining the birth characteristics and types of Dyskinetic Cerebral Palsy among the children attending FBDCH in Dhaka City.

3.2 Study area

Data for the present study were collected from Dyskinetic CP patient's parents attending FBDCH in Dhaka city.

3.3 Study place

The researcher is a student of 4th year B.Sc in physiotherapy 0f Saic College of Medical Science and Technology, Mirpur, Dhaka. Therefore, the study was carried out at FBDCH.

3.4 Study period

The study period was one year from January 2024 to December 2024.

3.5 Study population

The children with the age of 0 days to 10 years attending FBDCH constituted the study population for the study.

3.6 Sample size

The sample size for the present study was calculated by the following statistical formula. We know that -

$n=\frac{z^2 \times pq}{d^2}$ Here,

n = required sample size

z = confidence level at 95% (standard value of 1.96).

p = *p* is the estimated proportion of characteristics of dyskinetic cerebral palsy among the children of 15% (Bhooma, et al. 2016. *Journal of Pediatric Neurology*).

q = Complement of *p*, Calculated as (1-*p*).

d = Margin of the error at 5% (standard value of 0.05)

Now, sample size ,

$$n = \frac{(1.96)2 \times 0.15 \times 0.85}{(0.05)2}$$

$n = 196$

So, sample size became 196.

The calculated sample size for the present study was 196, due to limited patient data that couldn't be collected from the original sample size. The researcher had to collect data from 59 dyskinetic CP patients attending FBDCH.

3.7 Sampling technique

Purposive sampling technique was applied to select the sampling unit (dyskinetic CP patient) from the population.

3.8 Inclusion criteria

● Children with dyskinetic cerebral palsy were confirmed by a pediatrician.

● Mother who has children with dyskinetic cerebral palsy age between 4 - 8 years because of premature birth, birth complication, hypoxic ischemic encephalopathy, maternal health issues and untreated jaundice (Himmelmann et al. 2007, p. 246).

● Interview was taken only from the mother who was willing to participate in the study.

3.9 Exclusion criteria

● Other neurological conditions except dyskinetic Cerebral palsy were not confirmed by a pediatrician.

● Mothers who were mentally ill.

● Mothers who have dyskinetic Cerebral Palsy children age more than 8 years.

● Mothers who were unwilling to participate in this study.

3.10 Method of Data Collection

3.10.1 Technique of data collection

Face to face interview technique was applied to collect data from the respondents (mothers or caregivers) at FBDCH.

3.10.2 Instrument of data collection

A pretested questionnaire was the instrument for the present study. The questionnaire had 3 parts. The 1st part contained questions on personal information. The second part included questions on socio-demographic information and the third part contained questions on medical information.

3.10.3 Procedure of data collection

The researcher submitted her research protocol to the Ethical Review Board of SCMST for the approval to carry out the study. Permission was granted by the Ethical Review Board in due time. The researcher then visited the FBDCH and decided to conduct the study there. Permission was obtained from the hospital authority to carry out the research. Following this dyskinetic cerebral palsy patients attending the FBDCH were approached by the researcher. The aims and objectives of the study were explained in detail to the patient's guardians and it was clarified that they had the right to refuse to answer any question during the questionnaire. Participants were also informed that they could withdraw from the study at any time. Those who agreed to participate were included in the study. After obtaining written informed consent from the participants, the researcher began the interviews. A cordial environment was maintained during the interviews and the responses were recorded accordingly. Once the data were collected, the researcher thanked the respondents for their co-operation.

3.11 Management of data:

3.11.1 Data editing

It is characterized by reviewing and cleaning the collected data to identify and correct errors, inconsistencies, or missing information. The primary goal of data editing is to ensure the accuracy, reliability, and completeness of the data before proceeding with data analysis. Proper data editing helps to produce valid and meaningful research results.

3.11.2 Data entry

Data entry is the process of converting raw data from various sources into a digital format or a data management system, such as a spreadsheet, database, or data entry software. It is a fundamental step in research, business, and other domains where data

needs to be organized, analyzed, and utilized efficiently. Data entry involves carefully inputting information from paper documents, questionnaires, surveys, or other sources into a computer or electronic system.

3.11.3 Data analysis

Data were analyzed with the Statistical Package for Social Sciences (SPSS) Version 26.0 software. Descriptive statistics, such as frequency, distribution, range, mean, and percentage, were performed. Inferential statistics was used to analyze the relationship between independent and dependent variables.

3.12 Result

The findings of the study have been presented with the tabulations, charts, graphs and description in the result section of the thesis.

3.13 Ethical consideration

There must be strict compliance with ethical standards in this study. A good project proposal was presented to Saic College of Medical Science & Technology (SCMST). Department of Physiotherapy and SCMST Institutional Review Board (IRB) approval was also obtained for carrying out the study. The current research is complying with the Bangladesh Medical Research Council (BMRC) and the World Health Organization (WHO) standards for maintaining secrecy of all information of the participants at any step. Data were collected from dyskinetic cerebral palsy patients attending FBDCH , where the researcher also obtained permission from the Hospital Authority to carry out the study. Before the interview with the diabetic patients, the aims and objectives of the study were explained in detail to them. Interested participants were given consent forms, and the importance and content of the consent form were explained verbally in Bengali. The participants were informed that their participation would be completely voluntary, and they had the right to withdraw from the study at any time without any hesitation or risk. They were also assured that confidentiality would be maintained. Although the findings of the research might be presented or published, personal identifiers, such as their names and addresses, would not be disclosed. Participants were informed that data would be collected through written questionnaires. The supervisor also reviewed the consent form and the questionnaire. Permission was obtained from each participant, who signed the consent form before the interview. The participants were made aware of

their role in the research process. The study's information would only be discussed with the supervisor and would not be shared with any other individual. All materials related to the study would be disposed of upon completion. While the study's results may not have direct effects on the participants, the findings may benefit the field of Physiotherapy in the future. Participants were also assured that they would not face any harm from their involvement in the study.

CHAPTER-IV RESULTS

The aim of the research was to find out the birth characteristics of dyskinetic cerebral palsy among the children of Dhaka City in Bangladesh. Data were numerically coded and captured in Microsoft Excel to show the result, using a SPSS-26.0 version software program for analyzing the data as descriptive statistics. The descriptive statistics are percentages and presented by using pie, bar charts and tables. 59 participants were chosen for this research.

4.1: Socio-demographic information

Table no. 1 : Frequency distribution of respondents by Socio-demographic variables. (N=59)

Category	Frequency (N)	Percentage (%)
Age range		
0 - 3yrs	31	52.5
4 - 6yrs	15	25.4
7 - 9yrs	13	22.1
Total	59	100.0
Mean ± SD	4.15 ± 2.37	
Gender of Patient		
Male	36	61
Female	23	39
Religion		
Muslim	56	94.9

Hindu	2	3.4
Others	1	1.7
Living Area		
Rural	34	57.6
Urban	25	42.4
Father's Education Level		
Illiterate	2	3.4
Primary	4	6.8
Secondary	35	59.3
Graduation	16	27.1
Post Graduation	2	3.4
Mother's Education Level		
Illiterate	2	3.4
Primary	11	18.6
Secondary	36	61
Graduation	8	13.6
Post Graduation	2	3.4
Father's Occupation		
Service Holder	17	28.8

Businessman	18	30.5
Others	24	40.7
Mother's Occupation		
Service Holder	4	6.8
House Wife	54	91.5
Businesswoman	1	1.7
Monthly Income of Parents		
Lower Class < 22,500	24	40.7
Middle Class 22,500 – 37,500	20	33.9
Upper Class > 37,500	15	25.4
Type of Family		
Nuclear	19	32.2
Joint	40	67.8

This table presents the socio-demographic background of the 59 participants with dyskinetic cerebral palsy (CP). The majority (52.5%) were between 0-3 years old, with a mean age of 4.15 years and a standard deviation of 2.37, indicating a wide range in the age distribution. The proportion of male participants (61%) was notably higher than female participants (39%), suggesting a possible gender-based difference in CP prevalence.

In terms of religion, the overwhelming majority (94.9%) were Muslim, with only 3.4% Hindu and 1.7% from other religious backgrounds, reflecting the general demographic trends in Bangladesh.

Regarding living areas, a higher percentage of children (57.6%) were from rural regions, while 42.4% resided in urban areas. This indicates that dyskinetic CP affects children across all geographic locations, though access to medical care may differ between urban and rural areas.

The educational background of parents was assessed to understand their awareness levels regarding CP. Among fathers, most (59.3%) had completed secondary education, while 27.1% were graduates and only 3.4% had post-graduate degrees. The percentage of illiterate fathers was low (3.4%), indicating a reasonable level of education in the sample group. Similarly, 61% of mothers had secondary education, but a slightly lower percentage (13.6%) had completed graduation, and only 3.4% had postgraduate education. A notable 18.6% of mothers had only primary education, and 3.4% were illiterate, which may affect their understanding of their child's condition and access to healthcare.

The occupation of fathers varied, with 30.5% engaged in business, 28.8% in service-based jobs, and 40.7% in other forms of employment, reflecting a mixed socioeconomic background. In contrast, an overwhelming 91.5% of mothers were housewives, with only 6.8% working in service sectors and 1.7% engaged in business, highlighting traditional gender roles in Bangladeshi society.

The economic condition of families was categorized based on monthly income. The lower-income group (<22,500 BDT) constituted 40.7%, followed by 33.9% in the middle-income range (22,500 – 37,500 BDT), and 25.4% in the upper-income category (>37,500 BDT). The significant presence of low and middle-income families suggests financial challenges in managing CP-related healthcare expenses.

The family structure was predominantly joint families (67.8%), while 32.2% lived in nuclear families, indicating that traditional extended family support systems are still prevalent in Bangladesh. The presence of joint families may provide additional caregiving support for children with CP (Table no. 1).

4.2: Medical information

Table no. 2: Frequency distribution of respondents according to birth characteristics of Dyskinetic Cerebral Palsy.

Category	Frequency (N)	Percentage (%)
Disease During Pregnancy		
Yes	16	27.1
No	43	72.9
Type of Suffering		
DM	6	10.2
Hypertension	6	10.2
Others	3	5.1
None	44	74.6
Pregnancy Complications		
Yes	17	28.8
No	42	71.2
Type of Complication		
None	39	66.1
Abruptio Placenta	9	15.3
Preeclampsia	5	8.5

Uterine Rupture	6	10.2
Child Pregnancy Period		
Before 28 weeks	3	5.1
28 - 37 weeks	31	52.5
37- 40 weeks	25	42.4
Cried After Birth		
Yes	20	33.9
No	39	66.1
Physical Abnormalities After Birth		
Yes	39	66.1
No	20	33.9
Epilepsy		
Yes	47	79.7
No	12	20.3
Presentation During Labour		
Cephalic Presentation	49	83.1
Others	10	16.9

This table details the medical and prenatal conditions associated with dyskinetic cerebral palsy among the participants. 27.1% of mothers experienced health issues during pregnancy, while 72.9% had no medical complications. Among those with medical conditions, the most common illnesses were diabetes mellitus (10.2%) and hypertension (10.2%), both of which are known risk factors for pregnancy complications. Other illnesses were reported in 5.1% of cases, but their specific nature was not detailed.

Pregnancy complications were observed in 28.8% of cases, indicating a high prevalence of prenatal risk factors. The most frequently reported complications were abruptio placenta (15.3%), a condition where the placenta detaches from the uterus before birth, followed by preeclampsia (8.5%), a pregnancy disorder characterized by high blood pressure and potential organ damage, and uterine rupture (10.2%), a serious complication that can lead to birth asphyxia and neurological damage in the child.

The gestational age at birth was recorded to assess preterm birth risk. 52.5% of children were born preterm (between 28-37 weeks), 42.4% were full-term births (37 - 40 weeks), and only 5.1% were extremely preterm (before 28 weeks). The high percentage of preterm births indicates a strong association between dyskinetic CP and early delivery.

A crucial observation was birth asphyxia, as 66.1% of children did not cry immediately after birth, a sign of potential oxygen deprivation and neonatal distress. This high percentage highlights the importance of improved perinatal care in preventing CP.

Physical abnormalities after birth were detected in 66.1% of cases, suggesting a strong link between congenital factors and CP development. The presence of epilepsy was significantly high, affecting 79.7% of participants, making it one of the most prevalent comorbid conditions in children with dyskinetic CP.

The presentation during labor was predominantly cephalic (83.1%), meaning most babies were delivered head-first, which is the normal presentation. However, 16.9% had abnormal presentations, such as breech or transverse, which can increase the risk of birth complications and neurological damage (Table no. 2).

4.2.1: Place of birth

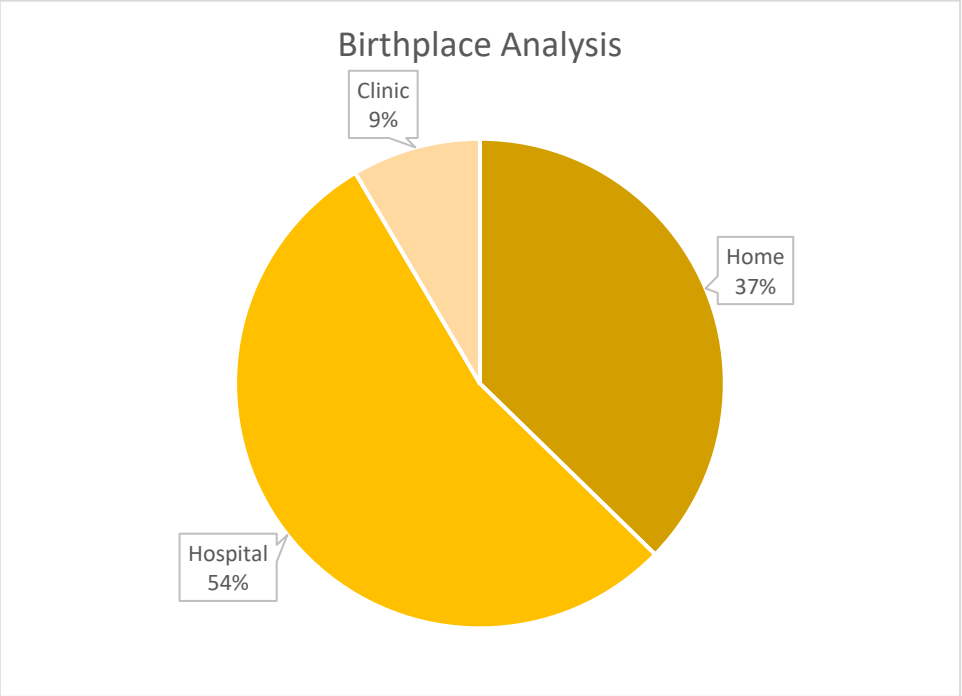


Figure no. 1: Frequency distribution of the children by place of birth

This figure illustrates the distribution of birthplaces among children with dyskinetic cerebral palsy. The majority of births (54.2%) occurred in hospitals, while 37.3% of deliveries took place at home. The remaining percentage represents births in other healthcare facilities. The high proportion of home births may indicate limited access to medical care, which could contribute to birth-related complications (Figure no. 1).

4.2.2: Type of delivery

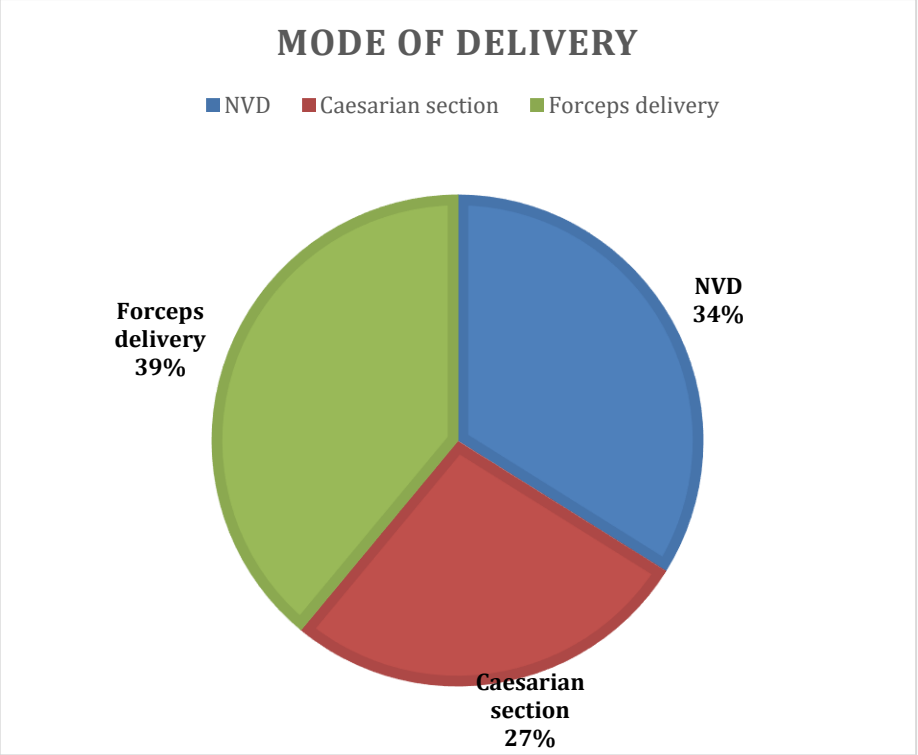


Figure no. 2: Frequency distribution of the children by type of delivery

This figure presents the different types of delivery methods. Forceps-assisted delivery was the most common, accounting for 39% of cases, followed by normal vaginal delivery (NVD) at 33.9%. Caesarean sections were performed in 27.1% of cases. The high rate of assisted deliveries suggests potential complications during childbirth, which could be linked to the development of cerebral palsy (Figure no. 2).

4.2.3: Types of Dyskinetic Cerebral Palsy

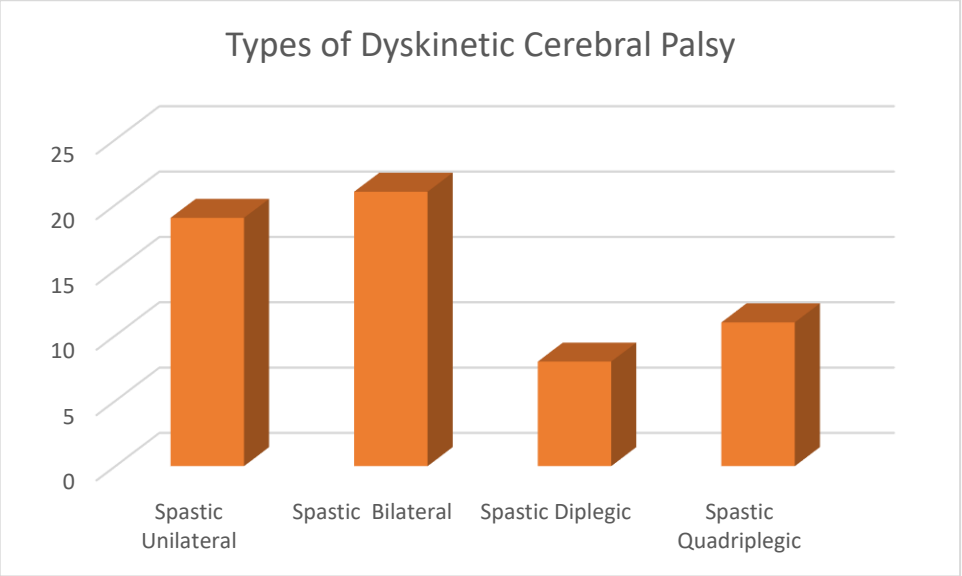


Figure no. 3: Frequency distribution of the patients by types of dyskinetic cerebral palsy

This figure categorizes the participants based on their CP subtype. Spastic bilateral CP was the most prevalent (35.6%), followed by spastic unilateral CP (32.2%). Spastic quadriplegic CP accounted for 18.6%, while spastic diplegic CP was the least common (13.6%). The data indicate that bilateral and unilateral CP subtypes are more frequently observed in this population (Figure no. 3).

4.2.4: Clinical Signs And Symptoms

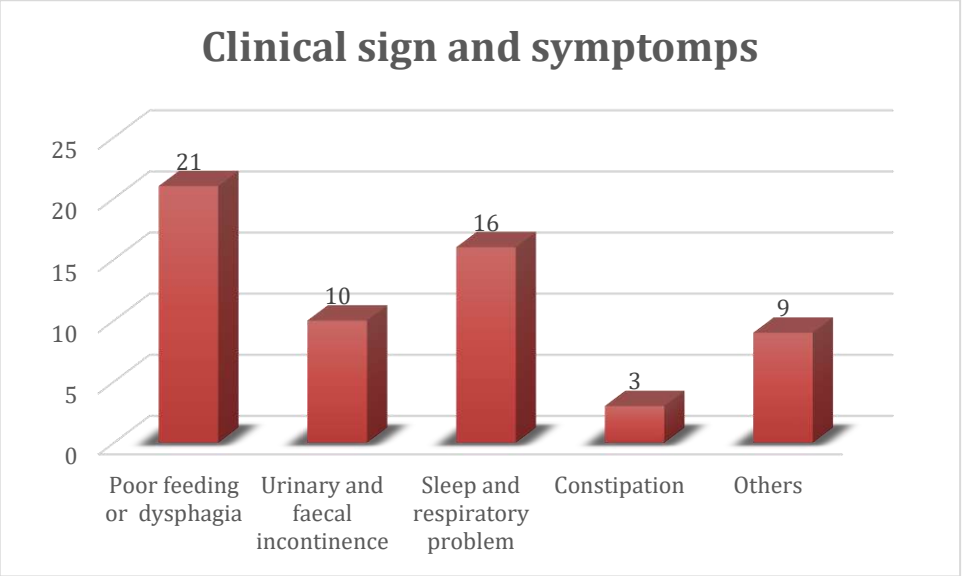


Figure no. 4: Figure Frequency distribution of the patients by clinical signs and symptoms

This figure depicts the most common clinical signs and symptoms among children with dyskinetic cerebral palsy. Poor feeding or dysphagia was the most frequently reported symptom (30.5%), followed by sleep and respiratory problems (20.3%). Urinary/fecal incontinence were each observed in 11.9% of cases. Other symptoms included constipation (6.8%), pain (3.4%), and miscellaneous issues (15.3%). These findings highlight the diverse range of medical complications associated with the condition (Figure no. 4).

4.3: Association between type of dyskinetic cerebral palsy and medical related information

Table no. 3: Association between type of Dyskinetic CP and Child Pregnancy Period

Child Pregna-ncy Period	Type of dyskinetic cerebral palsy				Total	X^2/p
	Spastic Unilate-ral	Spastic Bilateral	Spastic Diplegic	Spastic Quadriplegic		
Before 28 weeks	0 0.0%	2 3.4%	0 0.0%	1 1.7%	3 5.1%	5.179[a]/ 0.521
28 - 37 weeks	10 16.9%	13 22.0%	3 5.1%	5 8.5%	31 52.5%	
37 - 40 weeks	9 15.3%	6 10.2%	5 8.5%	5 8.5%	25 42.4%	
Total	19 32.2%	21 35.6%	8 13.6%	11 18.6%	59 100.0%	

The table examines the relationship between the type of dyskinetic cerebral palsy (CP) and the pregnancy period. The highest proportion of children (52.5%) were born between 28-37 weeks, with spastic unilateral CP accounting for 16.9% and spastic bilateral CP making up 22%. Full-term births (42.4%) were more prevalent among spastic diplegic (8.5%) and quadriplegic (8.5%) cases. Only a small percentage (5.1%) were born before 28 weeks, mainly observed in the spastic bilateral and quadriplegic groups. The chi-square test result ($\chi^2 = 5.179$, $p = 0.521$) indicates no statistically significant association between pregnancy period and DCP type (Table no. 3).

Table no. 4: Association between type of Dyskinetic CP and Labour presentation

Labour presentation	Type of dyskinetic cerebral palsy				Total	X^2/p
	Spastic Unilateral	Spastic Bilateral	Spastic Diplegic	Spastic Quadriplegic		
Cephalic presentation	17 28.8%	16 27.1%	7 11.9%	9 15.3%	49 83.1%	1.383[a]/ 0.709
Others	2 3.4%	5 8.5%	1 1.7%	2 3.4%	10 16.9%	
Total	19 32.2%	21 35.6%	8 13.6%	11 18.6%	59 100.0 %	

This table presents the relationship between the type of dyskinetic CP and labor presentation. Most children (83.1%) were delivered in a cephalic position, with spastic unilateral CP being the most common (28.8%), followed by spastic bilateral CP (27.1%). Non-cephalic presentations accounted for 16.9%, predominantly among spastic bilateral and quadriplegic CP cases. The chi-square test ($\chi^2 = 1.383$, $p = 0.709$) shows no significant association between labor presentation and DCP subtype (Table no. 4).

Table no. 5: Association between type of Dyskinetic CP and Epilepsy

Epilepsy	Type of dyskinetic cerebral palsy				Total	X^2/p
	Spastic Unilater-al	Spastic Bilateral	Spastic Diplegic	Spastic Quadriplegic		
Yes	17 28.8%	14 23.7%	6 10.2%	10 16.9%	47 79.7%	4.284[a]/ 0.232
No	2 3.4%	7 11.9%	2 3.4%	1 1.7%	12 20.3%	
Total	19 32.2%	21 35.6%	8 13.6%	11 18.6%	59 100.0%	

The table explores the link between epilepsy and different DCP subtypes. Epilepsy was present in 79.7% of cases, with spastic unilateral (28.8%) and quadriplegic CP (16.9%) showing the highest prevalence. Among the 20.3% without epilepsy, the highest proportion was in the spastic bilateral group (11.9%). Despite variations in epilepsy prevalence, the chi-square test ($\chi^2 = 4.284$, $p = 0.232$) indicates no significant association between DCP type and epilepsy (Table no. 5).

Table no. 6: Association between types of Dyskinetic CP and disease during pregnancy

Disease During Pregnancy	Type of dyskinetic cerebral palsy				Total	X^2/p
	Spastic Unilateral	Spastic Bilateral	Spastic Diplegic	Spastic Quadripleg-ic		
Yes	4 (6.8%)	3 (5.1%)	5 (8.5%)	4 (6.8%)	16 (27.1 %)	7.646[a]/ 0.054
No	15 (25.4%)	18 (30.5%	3 5.1%	7 11.9%	43 72.9%	
Total	19 32.2%	21 35.6%	8 13.6%	11 18.6%	59 100.0 %	

This table evaluates the relationship between maternal diseases during pregnancy and DCP subtypes. About 27.1% of mothers had pregnancy-related diseases, with spastic diplegic CP being the most affected (8.5%). The remaining 72.9% of mothers did not report any disease. The chi-square test ($\chi^2 = 7.646$, $p = 0.054$) shows a near-significant association, suggesting a potential link between maternal health and DCP type (Table no. 6).

Table no. 7: Association between type of Dyskinetic CP and types of suffering

Types of suffering	Type of dyskinetic cerebral palsy				Total	X^2/p
	Spastic Unilater-al	Spastic Bilateral	Spastic Diplegic	Spastic Quadripleg-ic		
DM	2 (3.4%)	0 (0.0%)	4 (6.8%)	0 (0.0%)	6 (10.2%)	21.316[a]/ 0.011
Hyperten -sion	2 (3.4%)	2 (3.4%)	0 (0.0%)	2 (3.4%)	6 (10.2%)	
Others	0 (0.0%)	1 (1.7%)	1 (1.7%)	1 (1.7%)	3 (5.1%)	
None	15 (25.4%)	18 (30.5%)	3 (5.1%)	8 (13.6%)	44 (74.6%)	
Total	19 (32.2%0	21 (35.6%)	8 (13.6%)	11 (18.6%)	59 (100.0 %)	

The table assesses the impact of specific maternal conditions on DCP subtypes. Diabetes was reported in 10.2% of cases, primarily among spastic diplegic CP (6.8%). Hypertension was observed in 10.2% of cases, affecting spastic unilateral, bilateral, and quadriplegic CP. Other conditions were seen in 5.1% of cases. The chi-square test (χ^2 = 21.316, p = 0.011) indicates a significant association, suggesting that maternal health complications could influence DCP development (Table no. 7).

CHAPTER-V DISCUSSION AND LIMITATION

Discussion

The main purpose of this study was to determine the birth characteristics of dyskinetic cerebral palsy among the children. The study was a descriptive type cross-sectional one conducted with the parents and grandparents of children of Dhaka city. It was conducted from July 2024 to January 2025. A total of 59 children's parents and grandparents were selected and interviewed making a response rate of 100% according to inclusion and exclusion criteria. The respondents were so enthusiastic that there is no missing data in this study. A structured questionnaire was developed according to the variable and the data were collected by face to face interview of the respondents. Data were cleaned, edited and analyzed with SPSS version 26.0. The data are presented through different tables and graphs. This section presents data with descriptive analysis initially and then inferential analysis is done to find out the association.

In this study, the mean age of the patients was 4.15 (SD = ± 2.37). Among them 36 (61%) children were males and 23 (39%) children were females in gender. Among the respondents most of them were mothers. In another study A total of 146 children's parents and grandparents were selected and interviewed making a response rate of 100% according to inclusion and exclusion criteria. Among them 80 (54.8%) children were males and 66 (45.2%) were females in gender. Among the respondents most of them were mothers (Evensen et al. 2023, p. 1468). In another study a total of 299 children's parents and grandparents were selected and interviewed making a response rate of 100% according to inclusion and exclusion criteria. In this study , the mean age of the patients was 9.9 (SD = ± 4.6). Among them 180 were males and 119 were females in gender. Among the respondents most of them were mothers (Kitai et al. 2020, p. 110). In another research 55 participants between 5 to 22 years fulfilled the criteria. The mean age of the patients was 14.6 (SD = ± 4.1). Among them 30 were males and 25 were females in gender (Monbaliu et al. 2017, p. 635). In other research 25 participants between 11 to 42 years fulfilled the criteria. The mean age of the patients was 21.55 (SD = ± 8.10). Among them 13 were males and 12 were females in gender (Julia et al. 2017, p. 4599). In other research a total of 50 children's parents and grandparents were selected and interviewed making a response rate of 100% according to inclusion and

exclusion criteria. In this study , the mean age of the patients was 25.96 (SD = ± 12.41). Among them 27 were males and 23 were females in gender. Among the respondents most of them were mothers (Hayos et al. 2017, p. 1212).

In this study regarding frequency distribution of the children by religion ,it was found that 56 (94.9%) children were muslims , 2 (3.4%) children were hindu and 1 (1.75%) were other religions. Of the total participants about 57.6% were from rural areas and about 42.4% were from Urban areas. Few parents completed their post-graduation and one fourth completed their graduation. One third of the children came from nuclear families. In another study half of parents completed their post-graduation and one fourth completed their graduation. Most of the children came from nuclear families (Evensen et al. 2023, p. 1468). In another research most parents completed their post-graduation and graduation. Most of the children came from nuclear families (Kitai et al. 2020, p. 110). In this study 44 (74.57%) children came from the average monthly family income group of 30000. Majority of the fathers were private service holders and about one in three of them were service holders. In the case of mothers, more than half of them were housewives. Among the participants , the most common clinical signs and symptoms were poor feeding or dysphagia. Among the participants, 21 (35.6%) children had spastic bilateral cerebral palsy, 19 (32.2%) children had spastic unilateral cerebral palsy, 11 (18.6%) children had spastic quadriplegia, and 8 (13.6%) had spastic diplegia. Spastic bilateral CP was the most prevalent type. In Thomas's study of the total participants, 45.3% had spastic bilateral cerebral palsy, 41.6% had spastic unilateral cerebral palsy, 8.1% had spastic quadriplegia, and 5% had spastic diplegia (Evensen et al. 2023, p. 1468). This study revealed that 16 (27.1%) mothers experienced diseases during pregnancy, while 43 (72.9%) mothers did not report any health issues. The majority of children (52.5%, n=31) were born between 28 and 37 weeks of gestation. Births from 37-40 weeks accounted for 42.4% (n=25), and 5.1% (n=3) before 28 weeks. All participants reported no trauma during their pregnancy period. The presentation during labor was predominantly cephalic (83.1%, n= 49), meaning most babies were delivered head-first, which is the normal presentation. However, 10 (16.9%) had abnormal presentations, such as breech or transverse, which can increase the risk of birth complications and neurological damage. Among the participants, 66.1% (n=39) had physical abnormalities noticed at birth, while 33.9% (n=20) showed no such abnormalities. The data revealed that 79.7% (n=47) of children were suffering from

epilepsy, while 20.3% (n=12) were not . Of the total children, 32 (54.2%) children had normal birth weights, while 25 (42.4%) had low birth weights, and 2 (3.4%) children had high birth weights. In Thomas' study all participants reported no trauma during their pregnancy. The majority of children (74.1%, n=106) were born between 37 and 42 weeks of gestation. Births from 28-37 weeks accounted for 19.6% (n=28), and 6.3% (n=9) before 28 weeks. The presentation during labor was predominantly cephalic (74.4%, n= 113), meaning most babies were delivered head-first, which is the normal presentation. However, 33 (22.6%) had abnormal presentations, such as breech or transverse, which can increase the risk of birth complications and neurological damage. The data revealed that 37.2% of children were suffering from epilepsy, while 62.8% were not . The majority of children (78.5%) had normal birth weights, while 21.5% had low birth weights (Evensen et al. 2023, p. 1469) . In Yukihiro's study among the participants, 77% had physical abnormalities noticed at birth, while 23% showed no such abnormalities. The majority of children (55%) had normal birth weights, while 45% had low birth weights (Kitai et al. 2020, p. 110). In other research the majority of children (n=22) were born after 37 weeks of gestation. Births before 37 weeks accounted for n = 3. The data revealed that 10 children were suffering from epilepsy, while 13 were not (Julia et al. 2017, p. 4599). Six of the 48 children were born before 34 full weeks of pregnancy, four between 34 and 36 weeks, and 38 at full term. The dyskinetic group's mean gestational age at birth was 38 weeks, while other CP kinds' mean gestational ages at the same time period were 35 weeks. Six children were LGA and one was SGA. One of the four children was a twin. Five children were born at 42 full weeks of gestation; one was LGA and the other four were appropriate for gestational age (mean SD 0.68). At more than 42 weeks gestation, none were born (K Himmelmann et al. 2007, p. 249).

The table in that study looks at the connection between pregnancy period and the type of dyskinetic cerebral palsy (CP). Of the children born between 28 and 37 weeks, the largest percentage (52.5%) had spastic unilateral CP (16.9%) and spastic bilateral CP (22%). The prevalence of full-term babies (42.4%) was higher in cases of spastic diplegia (8.5%) and quadriplegia (8.5%). Just 5.1% of babies were born before 28 weeks, mostly in the quadriplegic and spastic bilateral categories. There is no statistically significant correlation between DCP type and pregnancy duration, according to the chi-square test result ($p = 0.521$) (Table No. 3). The table in another

study illustrates the correlation between gestational age and the type of dyskinetic cerebral palsy (CP). Of the children born between 28 and 37 weeks, 19.6% had spastic unilateral CP, which accounted for 24.1% of the total. Among cases of spastic diplegia (36.8%) and quadriplegia (62.6%), full-term babies (74.1%) were more common. Just 6.3% of babies were born before 28 weeks, with the majority of these babies being in the diplegic categories. The result of the chi-square test shows a statistically significant correlation between DCP type and gestational age (Evensen et al. 2023, p. 1469) (Table no. 1).

This table shows the association between labor presentation and the kind of dyskinetic CP in that study. The majority of infants (83.1%) were born in a cephalic position, and the most prevalent type of cerebral palsy was spastic unilateral CP (28.8%), which was followed by spastic bilateral CP (27.1%). 16.9% of cases had non-cephalic presentations, primarily in cases with quadriplegic and spastic bilateral CP. There is no significant association between labor presentation and DCP subtype, according to the chi-square test ($p = 0.709$) (Table No. 4). This table illustrates how the type of dyskinetic CP and cephalic presentation relate to one another in other studies. The majority of children (77.4%) were born in a cephalic posture, and the most prevalent type of unilateral CP was spastic (81.9%). 22.6% of cases had non-cephalic presentations, primarily in cases of quadriplegic and spastic bilateral CP. The chi-square analysis reveals no significant association between cephalic presentation and DCP subtype (Evensen et al. 2023, p. 1469) (Table no. 1).

In this study the table explores the link between epilepsy and different DCP subtypes. Epilepsy was present in 79.7% of cases, with spastic unilateral (28.8%) and quadriplegic CP (16.9%) showing the highest prevalence. Among the 20.3% without epilepsy, the highest proportion was in the spastic bilateral group (11.9%). Despite variations in epilepsy prevalence, the chi-square test ($p = 0.232$) indicates no significant association between DCP type and epilepsy (Table no. 5). In another study the table explores the link between epilepsy and different CP subtypes. Epilepsy was present in 37.2% of cases, with spastic unilateral (15.1%) and quadriplegic CP (67.7%) showing the highest prevalence. Among the 62.8% without epilepsy, the highest proportion was in the spastic diplegic group (85.7%). Despite variations in epilepsy prevalence, the chi-square test (

$p < 0.001$) indicates the significant association between DCP type and epilepsy (Evensen et al. 2023, p. 1468) (Table no. 4)

In this study the table no. 6 evaluates the relationship between maternal diseases during pregnancy and DCP subtypes. In Thomas' study there were many associations between type of DCP and other medical information.

Among the three studies, Yukihiro's study conducted more participants. Then Thomas conducted the second more participants.Regarding birth characteristics, our results are largely in line with other European studies. The decrease in birth prevalence of dyskinetic CP is most likely due to general improvements in antenatal, obstetric, and neonatal care.

This study shows that health care facilities should be provided to dyskinetic CP patients to maintain and improve their daily living function to enhance their ability. The current study had the strength of being based on the well-established national CP register, where the diagnoses were reliable and extensive data was available. The limitations of the study include that classification of DCP has changed slightly over time. Furthermore the predominant expressed type of DCP may change over the lifetime of the patient and at some point the patient may encompass more spastic than dyskinetic features or vice versa. This study will help for other research.

Limitations

The study should be considered in light of the following limitations:

- Samples were collected from FBDCH. But it should be collected from different divisions in Bangladesh to make it more generalized.
- A sampling technique was adopted to select study children. So, representativeness of the sample could not be ensured.
- As a student, this study was conducted by my fund, so there might be some limitations of financial aspects in this study.
- The findings of the study could not be generalized to the wider populations.
- There were fewer patients with dyskinetic cerebral palsy.

CHAPTER-VI CONCLUSION AND RECOMMENDATION

Conclusion

Dyskinetic Cerebral Palsy is an under-emphasized type of Cerebral Palsy with significant challenges in management. Dyskinetic Cerebral Palsy was most prevalent in term-born, appropriate for gestational aged children with low Apgar score. The mean age of the patient attending at FBDCH is 4.15 years which is positive to provide early intervention to ensure a proper rehabilitation program to have a good prognosis. It has been observed that dyskinetic cerebral palsy is much more common in rural areas. In this research, among the participants, half of the children were born between 28 - 37 weeks of gestation age .The majority of children had epilepsy. Two-thirds of the children had physical abnormalities after birth. There is a significant association of birth characteristics between different medical information and type of dyskinetic cerebral palsy.The chi-square test indicates a significant association between types of suffering and types of DCP. The other chi-square test shows a near significant association between types of DCP and disease during pregnancy. This study shows that health care facilities should be provided to DCP to maintain and improve their daily living function to enhance their ability. Medical consultancy, term and hospital delivery, education, awareness about child disability and its prevention, and ensuring women's rights and improvements in antenatal, obstetric, and neonatal care can prevent DCP.

Recommendation

- Pregnant women should go for antenatal care regularly from the nearest health center.
- Children with cerebral palsy should consult a physician regularly for their illness. Modern treatment reduced the problem and improved their health.
- Awareness program on rehabilitation of patients of cerebral palsy to be organized at the community level.
- Improvement of antenatal, obstetric and neonatal care services in the health care sector can prevent DCP.

CHAPTER-VII REFERENCE

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APPENDIX

Informed Consent

Assalamu-alaikum/ Namaskar,

I am Sakia Billah Mim, student of B.Sc. in Physiotherapy, SAIC College of Medical Science and Technology (SCMST), affiliated with the Faculty of Medicine, University of Dhaka. For the partial fulfillment of my bachelor degree, I have to conduct a research project and it is a part of my study. My research title is "Birth Characteristics of Dyskinetic Cerebral Palsy in Dhaka City: A Cross-sectional Study"

I do expect that the interview will take 15-20 minutes. I also offer you to ask any sort of questions when you feel it is necessary to get insight.

I would like to inform you that this is a purely academic study and will not be used for any other purposes. I assure you that all the data will be kept confidential. Your participation will be voluntary. You may have the right to withdraw your consent and discontinue from the study at any point of time. You also have the right not to answer any other question that you don't like of this questionnaire.

If you have any query about the study, you may contact with me (01732675870) or my supervisor Dr. Syeda Sushmita Zafar, MBBS, MPH (01977710040) Assistant Professor, SCMST.

So, may I have your consent to proceed with the interview?

Yes…….. No……..

Signature of the participant ……. Date……

Signature of the researcher……. Date…….……

Signature of the witness……... Date…….……

সম্মতি পত্র

আসসালামু-আলাইকুম/ নমস্কার,

আমি সাকিয়া বিল্লাহ মিম, সাইক কলেজ অফ মেডিকেল সাইন্স অ্যান্ড টেকনোলজি(এসসিএমএসটি), চিকিৎসা অনুষদ, ঢাকা বিশ্ববিদ্যালয় এর অধিভুক্ত বিএসসি ইন ফিজিওথেরাপি বিভাগের শিক্ষার্থী। আমার ব্যাচেলর ডিগ্রী সম্পূর্ণ করার জন্য একটি গবেষণা প্রকল্প পরিচালনা করতে হবে, এবং এটি আমার পড়াশুনার একটি অংশ। আমার গবেষনার শিরোনাম "ঢাকা শহরে শিশুদের মধ্যে ডিস্কাইনেপটক সেরিব্রাল পালসিল জন্মের বৈশিষ্ট্য: একটি ক্রস বিভাগীয় গবেষণা"।

আমি আশা করি সাক্ষাৎকারটি ১৫-২০ মিনিট সময় নেবে। আপনার কোন কিছু জানা দরকার মনে হলে, যে কোন প্রশ্ন করতে পারেন।

আপনার অবগতির জন্য জানাচ্ছি যে, এটি সম্পূর্ণ একটি একাডেমিক গবেষণা এবং অন্য কোন উদ্দেশ্যে ব্যবহার করা হবে না। আমি আপনাকে নিশ্চয়তা দিচ্ছি যে, সকল তথ্য গোপনীয় রাখা হবে। এটি একটি স্বেচ্ছাসেবী অংশ গ্রহণ । আপনি যেকোন সময় আপনার সম্মতি প্রত্যাহার করে গবেষণা থেকে চলে যেতে পারেন। এছাড়াও, এই প্রশ্নাবলীতে যেকোন প্রশ্নের উত্তর না দেওয়ার অধিকার আপনার আছে।

আপনার যদি এই গবেষণা সম্পর্কে কোন প্রশ্ন থাকে তাহলে আপনি আমার সাথে (০১৭৩২-৬৭৫৮৭০) অথবা আমার সুপারভাইজার ডাঃ সৈয়দা সুস্মিতা জাফর, এমবিবিএস, এমপিএইচ (০১৯৭৭-৭১০০৪০)সহকারী অধ্যাপক, এসসিএমএসটি, এর সাথে যোগাযোগ করতে পারেন।

সাক্ষাৎকার এগিয়ে নেওয়ার জন্য কি আমি আপনার সম্মতি পেতে পারি ?

হ্যা..... না…….. ..

অংশগ্রহণকারীর স্বাক্ষর……. তারিখ……..

গবেষকের স্বাক্ষর……. তারিখ…….

সাক্ষীর স্বাক্ষর …… তারিখ…….

Research Questionnaire

Birth Characteristics of Dyskinetic Cerebral Palsy

Part-1: Personal Information

SL NO	Questions	Response
1	Patient's name:	
2	Patient's ID No:	
3	Date of interview:	
4	Address:	Village : Post office : P.S: District :
5	Caregiver's Name:	
6	Caregiver's Mobile No:	1 2

Part-2: Sociodemographic Information

SL NO	Questions	Coding	Response
1	What is the age of the patient?	In complete years	
2	What is the sex of the patient?	1.Male 2.Female	
3	What is his/her Religion?	1.Muslim 2.Hindu 3. Others	
4	What is the living area of the patient?	1.Rural 2.Urban	
5	What is his/her father's Educational level?	1.Illiterate 2.Primary 3.Secondary 4.Graduation 6.Post Graduation	

6	What is his/her mother's Educational level?	1.Illiterate 2.Primary 3.Secondary 4.Graduation 6.Post Graduation	
7	What is the occupation of his/her father?	1.Service Holder 2.Businessman 3.Retired 4. Others	
8	What is the occupation of his/her mother?	1.Service Holder 2.House Wife 3.Businesswoman 4.Retired 5. Others	
9	What is the monthly income of the parents?		
10	What is the type of your Family?	1. Nuclear 2. Joint	

Part-3: Medical Information

SL NO	Questions	Coding	Response
01	What are the clinical signs and symptoms of your child?	1. Poor feeding or dysphagia 2. Urinary and faecal incontinence 3.Sleep and respiratory problem 4. Constipation 5. Gastro oesophageal reflux 6. Pain 7. Others	
02	What type of dyskinetic cerebral palsy is it?	1. Spastic Unilateral 2. Spastic Bilateral 3. Spastic Diplegic 4. Spastic Quadriplegic	
03	Have you suffered from any disease during pregnancy?	1.Yes 2.No	
04	If yes, then what kind of suffering was it?	1.DM 2. Hypertension 4.Others 5. None	
05	Did you get any trauma during pregnancy?	1.Yes 2.No	

06	If yes, how and in which month of pregnancy?		
07	Were there any complications during your pregnancy?	1.Yes 2.No	
08	If yes, what type of complications was it?	1.Abruptio placenta 2. Umbilical cord complications 3. Clavicle fracture of baby 4. Preeclampsia 5. Uterine rupture	
09	When did your child born?	1.Before 28 weeks 2. Before 37 weeks but after 28 weeks 2. After 37 weeks 3.After 42 weeks	
10	Where did your child born?	1.Home 2.Hospital 3.Clinic	
11	What was the type of delivery of the newborn?	1.NVD 2.Caesarian section 3.Forceps delivery	
12	Did your child cry just after birth?	1.Yes 2.No	

13	What was your baby's birth weight?		
14	Did you mark any physical abnormalities after birth?	1.Yes 2.No	
15	Is your child suffering from epilepsy?	1.Yes 2.No	
16	What is the presentation during labour?	1. Cephalic presentation 2. Others	

প্রশ্নাবলী (বাংলা সংস্করণ)

“ঢাকা শহরে শিশুদের মধ্যে ডিস্কাইনেপটক সেরিব্রাল পালসিল জন্মের বৈশিষ্ট্য: একটি ক্রস বিভাগীয় গবেষণা”

<u>অংশগ্রহণকারীর তথ্য</u>

ক্রমিক নং	প্রশ্ন	উত্তর
১	রোগীর নামঃ	
২	রোগীর আইডি নংঃ	
৩	সাক্ষাৎকারের তারিখঃ	
৪	ঠিকানাঃ	গ্রামঃ ডাকঘরঃ থানাঃ জেলাঃ
৫	শুশ্রুষাকারীর নামঃ	
৬	শুশ্রুষাকারীর মোবাইল নাম্বারঃ	১. ২.

সামাজিক -জনসংখ্যা সংক্রান্ত তথ্য

ক্রমিক নং	প্রশ্ন	সারসংগ্রহ	উত্তর
১	রোগীর বয়স কত ?	সম্পূর্ণ বছরে	
২	রোগীর লিঙ্গ কি ?	১. পুরুষ ২. মহিলা	
৩	রোগীর ধর্ম কি ?	১. মুসলিম ২. হিন্দু ৩. অন্যান্য	
৪	রোগীর বসবাসের এলাকা কি ধরনের ?	১. শহর ২. গ্রাম	
৫	রোগীর পিতার শিক্ষাগত যোগ্যতা কি ?	১. নিরক্ষর ২. প্রাথমিক ৩. মাধ্যমিক ৪.স্নাতক ৫. স্নাতকোত্তর	
৬	রোগীর মাতার শিক্ষাগত যোগ্যতা কি ?	১. নিরক্ষর ২. প্রাথমিক ৩. মাধ্যমিক ৪.স্নাতক ৫. স্নাতকোত্তর	
৭	রোগীর পিতার পেশা কি ?	১.চাকুরীজীবি	

		২.ব্যবসায়ী ৩.অবসর প্রাপ্ত ৪.অন্যান্য	
৮	রোগীর মাতার পেশা কি ?	১.চাকুরীজীবি ২.ব্যবসায়ী ৩.অবসর প্রাপ্ত ৪.গৃহিণী ৫.অন্যান্য	
৯	পিতা-মাতার মাসিক উপার্জন কত ?		
১০	রোগীর পরিবারের ধরন কি ?	১.একক ২.যৌথ	

স্বাস্থ্য সম্পর্কীত তথ্য

ক্রমিক নং	প্রশ্ন	সারসংগ্রহ	উত্তর
০১	আপনার শিশুর রোগের চিহ্ন ও লক্ষণ কি ?	১.বিকলাঙ্গ ২.মলমূত্রের অসংযম ৩.ঘুমানো এবং শ্বাস প্রশ্বাসের সমস্যা ৪.কোষ্ঠকাঠিন্য ৫.ব্যাথা ৬.অন্যান্য	
০২	ডিস্কাইটিক সেরেব্রাল পালসির ধরন কি ?	১.স্পাসটিক ইউনিল্যাটেরাল ২.স্পাসটিক বাইল্যাটেরাল ৩.স্পাসটিক ডিপল্যাজিক ৪. স্পাসটিক কোয়াডিপল্যাজিক	
০৩	গর্ভাবস্থায় আপনি কোন রোগে আক্রান্ত ছিলেন ?	১. হ্যাঁ ২. না	
০৪	যদি হ্যাঁ হয়, তাহলে কোন রোগ ?	১. ডি এম ২. উচ্চ রক্তচাপ ৩. অন্যান্য ৪. কোনোটিই নয়	

০৫	গর্ভাবস্থায় আপনি কোনো মানসিক আঘাত পেয়েছিলেন ?	১. হ্যাঁ ২. না	
০৬	যদি হ্যাঁ হয়, তাহলে কোন মাসে ?		
০৭	গর্ভাবস্থায় কোনো জটিলতা হয়েছিল কি ?	১. হ্যাঁ ২. না	
০৮	যদি হ্যাঁ হয়, তাহলে কি ধরনের জটিলতা ?	১.অ্যাব্রেটিও প্লাসেন্টা ২.নারীর সমস্যা ৩.শিশুর ক্ল্যাভিকল ফ্র্যাকচার ৪.প্রি-এক্লাম্পসিয়া ৫.জরায়ুর বিদারণ	
০৯	শিশুটি কখন জন্ম গ্রহণ করেছে ?	১.২৮ সপ্তাহের আগে ২. ২৮ এবং ৩৭ সপ্তাহের মাঝে ৩. ৩৭ সপ্তাহের পরে ৪. ৪২ সপ্তাহের পরে	
১০	শিশুটি কোথায় জন্ম গ্রহণ করেছে ?	১. বাসা ২. হাসপাতাল ৩.ক্লিনিক	
১১	শিশুর কোন মাধ্যমে প্রসব হয়েছিল ?	১. নরমাল ডেলিভারি ২. সিজারিয়ান পদ্ধতি ৩. ফরসেপ ডেলিভারি	
১২	শিশুটি জন্মের পর কেঁদেছিল ?	১. হ্যাঁ ২. না	

১৩	শিশুটি জন্মের সময় ওজন কত ছিল ?		
১৪	জন্মের পর অস্বাভাবিক কিছু লক্ষ্য করেছিলেন ?	১. হ্যাঁ ২. না	
১৫	শিশুটি মৃগীরোগে আক্রান্ত ছিল ?	১. হ্যাঁ ২. না	

১৬	গর্ভাবস্থায় শিশুর অবস্থান কেমন ছিল ?	১. সিফালিক প্রজেন্টেশন ২. অন্যান্য	

Permission Letter

27 October 2024

To

General Secretary

Bangladesh Council For Child Welfare (BCCW)

Adress: 22/1 Topkhana Road,Dhaka -1000

Subject: Characteristics of Dyskinetic Cerebral Palsy in Dhaka city for permission to collect data from the Firoza bari disabled children hospital (FBDCH) to conduct a research project.

Sir,

With due respect and humble submission to state that I am a student of B.Sc. in Physiotherapy at SAIC College of Medical Science and Technology (SCMST). As a part of our course curriculum, we have to conduct a research project for the partial fulfillment of the requirement for the degree of B.Sc. in Physiotherapy. My research title is "Characteristics of Dyskinetic Cerebral Palsy in Dhaka city" and the aim of the study is to investigate the characteristics of Dyskinetic Cerebral Palsy in Dhaka city.

This is a cross sectional study under the supervision of Dr. Sushmita Zafar, Lecturer (SCMST). I have chosen the Firoza bari disabled children hospital (FBDCH) as a site of data collection.

So, I, therefore, pray and hope that you would be kind enough to give permission for data collection that will help me to complete my study.

Yours Faithfully

Sakia Billah Mim

Student of B.Sc. in Physiotherapy

Session: 2018 -2019

Reg No: 10461

SAIC College of Medical Science and Technology (SCMST)

Mirpur-14, Dhaka 1216, Bangladesh.

SCMST-BPT/IRB/05-24/052

To
Sakia Billah Mim
4th Year Student of B.Sc. in Physiotherapy
Session: 2018-2019, Reg. No:10461
SAIC College of Medical Science &Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

Subject: Approval of the thesis proposal **"Birth Characteristics of Dyskinetic Cerebral Palsy in Children of Dhaka City"** by ethics committee.

Dear Sakia Billah Mim

Congratulations.
The Institutional Review Board (IRB) of SCMST has reviewed and discussed your application to conduct the above-mentioned dissertation, with yourself, as the principal investigator. The Following documents have been reviewed and approved:

Sr. No.	Name of the Documents
1	Research Proposal
2	Questionnaire (English and Bangla version)
3	Information sheet & consent form.

The purpose of the study is to determine the Birth Characteristics of Dyskinetic Cerebral Palsy in Children of Dhaka City. Thestudy involves face to face interview by using structured questionnaire to explore the Barriers and Challenges Confronted by Mother or Caregiver of DCP Patients in Dhaka city that may take 30 to 40 minutes to fill in the questionnaire and 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 at09.00 AM on 28th September 2023 at SCMST.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring during 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,

10.06.24

Dr. Abul Kasem Mohammad Enamul Haque
Principal, SCMST&Chairman, Institutional Review Board (IRB)
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

BANGLADESH COUNCIL FOR CHILD WELFARE-BCCW
বাংলাদেশ শিশু কল্যাণ পরিষদ-বাশিকপ
Registered with Department of Social Services, # 201(1962)/ Foreign Donation Registration # 499
22/1 Topkhana Road, Dhaka-1000, Phone : 02223384257, 02223389760
E-mail: shishukallyanparishad@gmail.com, Website : www.bccw-bd.org

ফা-ভি-০৮/বাশিকপ২০০৬(প্রশাসন)-অংশ-২-প-৫০০ তারিখ : ৩১-১০-২০২৪

বরাবর
সাকিয়া বিল্লাহ মিম
শিক্ষার্থী, বিএসসি ইন ফিজিওথেরাপী বিভাগ
সাইক কলেজ অব মেডিকেল সায়েন্স অ্যান্ড টেকনোলজি
সাইক টাওয়ার, এম-১/৬, মিরপুর # ১৪
ঢাকা-১২১৬।

বিষয় : ডাটা কালেকশনের অনুমতি প্রসঙ্গে।
সূত্র : আপনার ২৭ অক্টোবর ২০২৪ইং তারিখের প্রেরিত পত্র।

উপর্যুক্ত বিষয়ে সূত্রোল্লিখিত পত্রের বর্ণনা মতে আপনাকে বাংলাদেশ শিশু কল্যাণ পরিষদ পরিচালিত ফিরোজা বারি প্রতিবন্ধী শিশু হাসপাতালে **"Characteristics of Dyskinetic Cerebral palsy in Dhaka city"** উপর ডাটা কালেকশনের জন্য সম্মতি জ্ঞাপন করা হলো। এক্ষেত্রে প্রতিষ্ঠানের পক্ষ থেকে কোনরূপ ভাতা বা সম্মানী প্রদান করা হবে না এবং প্রতিষ্ঠান কর্তৃক নির্ধারিত সময় ও নিয়ম নীতি অবশ্যই মেনে চলতে হবে। এতদসংশ্লিষ্ট যাবতীয় বিষয়ে পরবর্তী কার্যক্রম সম্পাদনের জন্য মিসেস ইয়াসমিন আরা ডলি, পরিচালক, বাশিকপ-এর সাথে (02223384257-Ex-107) যোগাযোগ করার অনুরোধ জানানো হলো।

ধন্যবাদান্তে

মোহাম্মদ মাহবুবুল আলম
সাধারণ সম্পাদক, বাশিকপ

অনুলিপি
১. মিসেস ইয়াসমিন আরা ডলি, পরিচালক, বাশিকপ এবং চীফ ফিজিওথেরাপিস্ট ও ট্রেনিং কো-অর্ডিনেটর, ফিরোজা বারি প্রতিবন্ধী শিশু হাসপাতাল।
২. অফিস কপি

Gantt Chart

Activities/ months	Sep 23	Oct 23	Nov 23	Dec 23	Jan 24	Feb 24	Mar 24	Apr 24	May 24	June 24	July 24	Aug 24
Proposal presentation												
Introduction												
Literature review												
Methodology												
Data collection												
Data Analysis												
Result												
1st progress presentation												
Discussion												
Conclusion And Recommendation												
2nd progress presentation												
Communication with supervisor												
Final submission												