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Factors Associated among Children with Cerebral Palsy Attending in Selected Hospital and Rehabilitation Center in Dhaka District

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DECLARATION

This work has not previously been accepted in substance for any degree and isn't concurrently submitted in candidature for any degree. This dissertation is being submitted in partial fulfillment of the requirements for the degree of B.Sc. in Physiotherapy. I declare that this is all my own work and has not been previously submitted for assessment and it does not contain unreferenced material copied from any other source. I am aware about plagiarism, if it is shown that material has been plagiarized, or I have otherwise attempted to obtain an unfair advantage for myself or others, I understand that I may face sanctions in accordance with the policies and procedures of the Institute. A mark of zero may be awarded and the reason for that mark will be recorded on my file.

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LIST OF ACRONYMS

ERB	**:**	Ethical Review Board
IRB	**:**	Institutional Review Board
SCMST	**:**	Saic College of Medical Science and Technology
CP	**:**	Cerebral Palsy
SD	**:**	Standard Deviation
SPSS	**:**	Statistical Package for the Social Sciences
USA	**:**	United States of America
WHO	**:**	World Health Organization
ROM	**:**	Range of Motion.
IQ	**:**	Intelligence Quotient
ATP	**:**	Adenosine Triphosphate
UTI	**:**	Urinary Tract Infection

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ABSTRACT

Introduction: Cerebral palsy (CP) is the most common motor disability in childhood, caused by non-progressive disturbances in the developing brain. Children with CP often face activity limitations, motor dysfunction, and complications related to pregnancy and birth. In Bangladesh, CP is a growing public health issue with multiple prenatal, perinatal, and postnatal risk factors. **Objective:** To determine the factors associated among children with cerebral palsy attending in selected hospital and rehabilitation center in Dhaka district. **Methodology:** This was a descriptive type of cross-sectional study conducted from July 2024 to June 2025. Data were collected from 203 children with cerebral palsy and their caregivers attending Firoza Bari Disabled Hospital, Bangladesh Shishu Hospital and Institute, and Suraksha Health Care, Savar. A pretested structured questionnaire was used, and data were analyzed using SPSS. Frequency distribution, descriptive analysis, and chi-square tests were applied to identify associations between maternal, perinatal, and socio-demographic factors and CP. **Results:** The average age of the children was 4.52 years (±2.93). Most were aged 3-5 years (36.0%), and 52.2% were male. A large proportion lived in villages (62.6%), and most mothers were housewives (98.5%). Several maternal health conditions were recorded, including urinary tract infection (18.2%), hypothyroidism (7.9%), and asthma (9.4%). Perinatal risk factors included head injury (50.7%), breathing difficulties at birth (38.9%), delayed crying after birth (43.8%), low birth weight (11.8%), and NICU admission (29.1%). Oxygen support was required in 40.9% of cases. Significant associations were found with consanguineous marriage, maternal age, pregnancy type, miscarriage history, urinary tract infection, neonatal jaundice, and the presence of another disabled child in the family. **Conclusion:** This study highlights that multiple maternal, perinatal, and genetic factors contribute to cerebral palsy among children in Dhaka. The findings emphasize the importance of improving maternal healthcare, antenatal check-ups, and early neonatal care to reduce preventable risk factors. Community-based awareness and rehabilitation services are needed to reduce the burden of CP and improve the quality of life of affected children and their families.

Key Words: *Cerebral palsy, Children, Associated factors, Maternal health, Dhaka*

CHAPTER - I: INTRODUCTION

1.1 Background

A neurodevelopmental illness known as cerebral palsy (CP), which is often associated with progressive brain damage, is characterized by anomalies in muscle tone, mobility, and motor skills is a common name attributed to developing brain damage (Sadowska, Sarecka-Hujar & Kopyta 2020, p. 1514). A neurological disorder caused by brain injury, cerebral palsy (CP) frequently develops prior to, during, or soon after birth (Mithun et al. 2023, p. 172). It is frequently linked to viral disorders, congenital defects, or birth accidents and causes sensory-motor dysfunction that affects posture and movement control (Hasan et al. 2023, p. 5).

Cerebral palsy is a group of neurodevelopmental disorders that start early in infancy and last for the rest of a person's life. They cause problems with movement and posture, which can show up as spasticity, dystonia, choreoathetosis, and ataxia (Dan et al. 2025, p. 702). The clinical neurological illness known as cerebral palsy (CP) is defined by a variety of symptoms, including abnormal posture or movement, and it usually manifests early in life (Friedman et al. 2022, p. 410). Symptoms usually occur early in childhood and indicate persistent, non-progressive deficits (Alam et al. 2023, p. 225). Cognitive, sensory, language, behavior, musculoskeletal disorders, and epilepsy can all coexist with motor disability. The etiology of CP is complex, multifaceted, and poorly understood, with numerous factors potentially contributing to its development (Friedman et al. 2022, p. 405).

The diagnosis of CP tends to be complicated and delayed and typically occurs at 1-2 years of age or older. Thus, early identification of CP is critical, since it allows for treatments that can have a major influence on children’s health outcomes (Bae et al. 2012 p. 35). A collection of chronic illnesses known as cerebral palsy is characterized by abnormal tone, posture, and movement. According to the predominant motor syndrome, which includes extrapyramidal or dyskinetic, spastic hemiplegia, spastic diplegia, and spastic quadriplegia, cerebral palsy affects two to three infants out of every 1,000 live births (Patel et al. 2020, p. 125). A significant growth in research, CP registers, and increased information availability have allowed us to learn more about cerebral palsy than ever before. While the prevalence of CP is declining in high-income

nations, it is probably rising in lower- and middle-income nations and reducing in newborn and pediatric mortality (McIntyre et al. 2022, p. 1496). The diagnosis of particular cerebral palsy can be made after the age of three to five, despite the fact that its clinical characteristics are noticeable throughout the first few years of life. The most prevalent type involves spasticity and a persistent loss of motor function (Hallman-Cooper and Cabrero 2024, p. 3). A population-based survey of children aged 3-17 years in the USA indicated that the prevalence of cerebral palsy ranked ninth among ten conditions: attention deficit hyperactivity disorder, autism spectrum disorder, blindness, cerebral palsy, moderate to profound hearing loss, learning disability, intellectual disability, seizures, stuttering or stammering, or any other developmental delay (Cogswell, Coil and Tian 2022, p. 455).

The many kinds of motor abnormalities are used to categories CP. Secondary issues that accompany epilepsy include visual and hearing issues, communication and nutrition issues, mental retardation, incontinence of the bowels and urine, and issues with the spine and hips (Duke et al. 2019, p. 420). Men are more likely than women to have cerebral palsy (CP), and CP is more common in rural than in urban regions in China, where it's the prevalence rate is 2.07% (Yang et al. 2021, p. 4). Bangladesh, one of the world's most densely populated countries, is facing tremendous social and economic issues due to disability. In many societies, the birth of a disabled child is regarded as a misfortune or even a punishment, with parents sometimes stigmatized as if they had committed a serious fault. While knowledge and opinions of disability have increased in affluent countries, many developing countries, like Bangladesh, continue to lack understanding (Ferdous et al. 2023, p. 95). According to prevalence surveys carried out in Turkey, the rate of CP is 4.4 per 1000 live births, whereas the global prevalence is 2.1 per 1000 live births (Sultanoglu, Akyuz and Cevikol 2019, p. 267)

However, compared to high-income countries, this rate is larger in low-income countries. Permanent injury to the cerebral cortex during pregnancy, labour, and for up to two years following delivery are etiological risk factors for cerebral palsy. Low birth weight, anoxia, and early birth are some of the most significant etiological risk factors. It is suggested that CP is more common in premature infants because blood arteries in particular areas of the brain are not fully matured, leaving them vulnerable to various types of harm and traumas (Wang et al. 2022, p. 2). CP causes between 42 and 45

percent of disabilities. Children with severe impairments have significant social and economic effects on their patients, families, and careers (Frslev et al. 2015, p. 62). In Bangladesh, over 2.6 million children have severe impairments, yet only about 1,500 get formal special education through government programmers. Pilot research in Shahjadpur, a rural district, discovered 859 children with significant physical impairments, nearly half of them (48.5%) had cerebral palsy (Sunny et al. 2020, p. 138). While mobility issues are the main focus of cerebral palsy, thinking, learning, feeling, communication, and behavior issues frequently coexist (Van Gorp et al. 2020, p. 16). Although CP does not develop, the clinical appearance may change as the brain ages. Despite advancements in obstetrics and newborn care, the prevalence of CP continues at around 2 per 1,000 live births (Stavsky et al. 2017, p. 3). In Australia, cerebral palsy affects 2 to 2.5 out of every 1,000 live births and is the leading cause of physical disability in children. Similarly, prevalence estimates of 2.0 to 2.5 per 1,000 births equate to 15,000-20,000 afflicted children in Canada and around 150,000 in the United States, with the majority of them being cared for at home by their family (Bari et al. 2023, p. 19).

Identifying risk factors for cerebral palsy (CP) and creating strategies for early diagnosis and motor function rehabilitation have been the main topics of several prior publications (Sadowska et al. 2020, p. 1510). Lately, there has been a lot of study focused on the behavioral problem and psychological issues that children with cerebral palsy have attracted significant (Vitrikas et al. 2020, p. 220). However, there is a dearth of thorough, scientific, and precise data about the emotional issues that children with cerebral palsy face globally. The goal of this study was to offer thorough theoretical support for comprehending the existing circumstances and contributing elements impacting Chinese toddlers with cerebral palsy. Additionally, our goal was to create a new method for identifying the early indicators of emotional issues in kids with cerebral palsy and using that information to guide the application of focused interventions and therapies. Up to one in four children with CP have behavioral or emotional issues (Parkes et al. 2020, p. 405). Recent studies have shown that socioeconomic status is highly effective in determining risk factors in CP etiology. For example, while factors during childbirth are effective in developing countries, prenatal causes are at the forefront in developed countries (King, El Imam and McIntyre 2022, p. 541). In areas of poor socioeconomic status, gestational age, birth weight, and maternal education

level may be associated with the risk of CP. Smoking during pregnancy has been shown to be directly associated with low birth weight (Ren et al. 2020, p. 49). Additionally, a large number of children fit the criteria for comorbid mental health diagnoses such behavioral disorders, anxiety, depression, and attention-deficit or hyperactivity disorder These conditions can impair children's wellbeing and negatively impact family members' quality of life (Weber et al. 2016, p. 270). According to further research, 16% of Bangladeshi children with cerebral palsy were born into congenital unions; comparable correlations were observed in Turkish and Syrian communities (Khandaker et al. 2014, p. 365). From January to December 1998, an examination at the Shishu Bikash Clinic (rural clinic) revealed that CP was responsible for 42% of child deficits, with spastic tetraplegia accounting for 19%, spastic diplegia for 3%, and ataxic variants accounting for 3%. These findings indicate that CP accounts for a significant portion of childhood impairment in Bangladesh (Tufael et al. 2023, p. 55). The goal of this study is to look into the characteristics of CP and uncover significant variables that may partially or entirely explain the condition in children, leading in scientific insights into its prevalence and implications (Faruk et al. 2023, p. 78).

Extreme activation is typically the cause of muscle shrinkage in individuals with high muscle tones. Some persons with CP have poor muscle tone, although the majority have issues with muscle tone. Abnormal muscular tone, reflexes, or tool development and coordination are characteristics of cerebral paralysis. Babies with large brains are frequently untidy at birth, and their bodies can be either very soft or very rigid. Congenital defects in CP can occasionally manifest as a tiny skull or jaw bone. As the youngster grows or changes, symptoms may manifest. Symptoms do not appear right away in newborns with cerebral paralysis (Marpole et al. 2020, p. 333). Early onset of social-emotional issues also frequently results in more serious issues for kids, which has a direct impact on how well clinical rehabilitation therapy works. Early assessment of these disorders is thus advised in order to ensure early access to resources and related treatment. It has previously been demonstrated that at a frequency three times higher than that of typical children, over 40% of preschool-aged children with cerebral palsy experience serious psychological and behavioral problems (Sigurdardottir, Indredavik & Eiriksdottir 2020, p. 1060).

1.2 Justification of the study

CP creates a lifelong burden for both individuals and families. Understanding its preventable risk factors will help reduce its prevalence and improve quality of life through early intervention and awareness programs. There is limited data in Bangladesh and other low-resource settings regarding the socio-demographic and perinatal factors associated with CP. This study will fill that knowledge gap by identifying local risk factors that contribute to CP. The findings will help healthcare professionals design effective maternal and child health programs. It will guide policymakers to create targeted public health interventions, such as promoting safe pregnancy practices and reducing consanguineous marriages. Conducting this study will enhance the researcher's skills in evidence-based practice, data collection, and analysis. It will also strengthen their ability to apply physiotherapy knowledge in research and rehabilitation planning. Evidence-based practice by providing data-driven insights, the study will help healthcare professionals deliver interventions based on strong evidence rather than assumptions, leading to better outcomes for children with CP. The study will create a foundation for future researchers to explore advanced rehabilitation methods, early detection tools, and prevention strategies for CP. Enhances the role of physiotherapists in preventive care and rehabilitation. Strengthens interprofessional collaboration in managing CP. Promotes the development of specialized rehabilitation programs based on identified risk factors. Reducing the incidence of CP will decrease the social and economic burden on families and communities. Increased awareness and early care will improve the quality of life for children and promote inclusive participation in education and society. Supports the government's goal of improving maternal and child health services. Provides data to shape national health policies and resource allocation for CP prevention and management. Helps create structured, culturally appropriate rehabilitation programs. Promotes early physiotherapy interventions to improve functional outcomes for children with CP. Encourages multidisciplinary teamwork in rehabilitation centers.

1.3 Research Question

What are the associated factors among children with cerebral palsy attending in selected hospital and rehabilitation center in Dhaka district?

1.4 Objective of the study

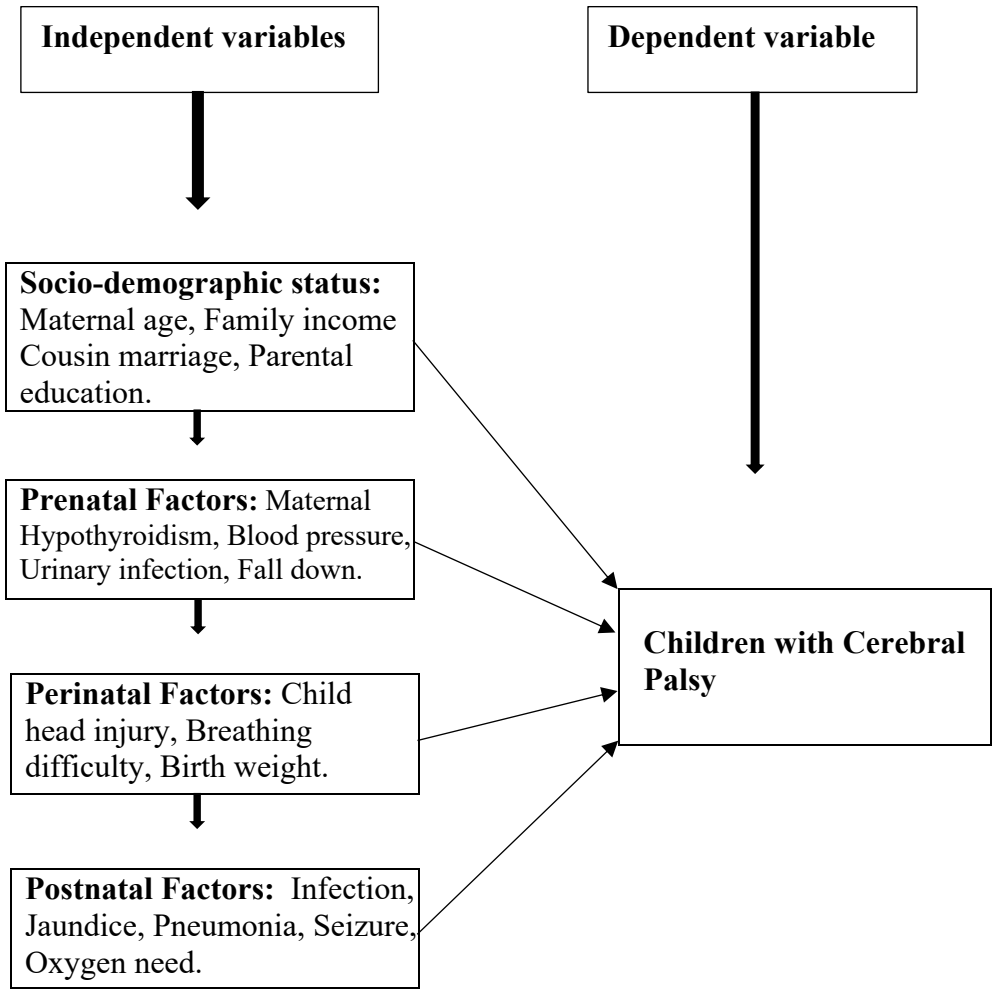
1.4.1 General Objective

- To determine the factors associated among children with cerebral palsy attending in selected hospital and rehabilitation center in Dhaka district**.**

1.4.2 Specific Objective

- To identify the sociodemographic factors among children with cerebral palsy attending in selected hospital and rehabilitation center in Dhaka district**.**
- To collect information on diseases (comorbidity) of the mothers during pregnancy, delivery and after birth history of children.
- To analyzed the association between cerebral palsy and socio-demographic and disease related information.

1.6 Conceptual Framework



1.6 Operational definition of Variables:

Cerebral Palsy: Cerebral palsy can be defined as a group of neurological conditions caused by a non-progressive lesion or abnormalities of the developing brain that happens before (utero) birth, during birth or after birth which manifests as a variety of difficulties in the co-ordination of muscle action, physical mobility, and sensation.

Perinatal: It refers to the period just before, during, and shortly after birth, usually from the 20th week of pregnancy to the 28th day after birth. This stage is important because complications during this time can affect the health and development of the newborn.

Postnatal: It refers to the period after birth, beginning immediately after delivery and continuing for several weeks. This stage is important for monitoring the baby's growth and preventing health complications.

Socioeconomic Status: It refers to the social and economic position of a family, usually measured by income, education, and occupation. It influences access to healthcare, nutrition, and overall well-being.

Parental Education: It refers to the level of formal education attained by the parents. It plays an important role in child care, health awareness, and decision-making for treatment and support.

Children: Refers to individuals in the early stages of life, typically from birth to adolescence. In this context, it specifically refers to young individuals diagnosed with cerebral palsy.

CHAPTER - II: LITERATURE REVIEW

The current definition of cerebral palsy (CP) describes it as a collection of postural and mobility disabilities that restrict activity, resulting from nonprogressive anomalies in the developing foetal or newborn brain (Go et al. 2021, p. 178). However, we should not think of CP as a singular disease existence, but rather as a diverse collection of etiological disorders that begin early in development and are characterized by abnormal movement or posture (Fleiss and Gressens 2012, p. 560). According to the research, one of the most significant risk factors for cerebral palsy is premature delivery. The proportionately greater rates of low birth weight and preterm newborns in our research were noteworthy. It is also possible to investigate the cause of preterm births as a distinct research topic (Patel, Neelakantan and Pandher 2020, p. 125).

A post- neonatally acquired CP diagnosis indicates a lifelong handicap; therefore, a clinical diagnosis of CP has consequences for the family (McIntyre et al. 2011, p. 120) In their study, (Gincota, Jahnsen and Spinei 2021, p. 540) found a correlation between CP and poor socioeconomic position. According to the mothers' declarations in our study, these families' income levels were low (73.3%) and moderate (24.8%), and their poor socioeconomic position was a notable risk factor for cerebral palsy. Small species are classified according to specific problems available. For example, those who are solid muscles have CP primary brain semi-paralyzing, movement weak coordination Ataxic brain paralysis and twisting movements are found in people with dyskinetic brain. The diagnosis is based on the development of a child. Blood tests and medical images can be used to exclude other possible reason (Tolkinjonova 2025, p. 62)

According to research by (Forthun, Yalan and Strandberg-Larsen 2020, p. 1176) half of the patients indicated that their mother was illiterate, suggesting that CP may be linked to poor educational attainment. This study aimed to increase public knowledge of the preventable risk factors in the etiology of cerebral palsy. Our study's results concurred with those of a number of previous research studies in the literature. More over three-quarters of the cases were premature deliveries, and almost half had low birth weight. Again, more than half of the children were born as a result of consanguineous marriage, and more than 80% of the women were either illiterate or had only had a rudimentary education. According to two-thirds of households, their

income was inadequate (Basaran et al. 2023, p. 3). In addition to the developmental disruption brought on by the initial shock to the developing brain, injury can persist for several months or even years (Fleiss and Gressens 2012, p. 560). According to (Cantero, Medinilla and Martinez 2021, p. 276) study, preterm delivery and low birth weight were the most common risk factors for cerebral palsy. According to the results of the literature, 73.3% of the cases in our study were born before the 37th week of pregnancy, and nearly half of the cases weighed less than 2,500 grammes at birth. However, compared to high-income countries, this rate is larger in low-income countries. Permanent brain damage sustained during pregnancy, childbirth, and for up to two years after giving birth is one of the etiological risk factors for cerebral palsy. Low birth weight, anoxia, and premature birth are some of the most significant etiological risk factors (Sucuoglu 2018, p. 219)

Cognitive assessment and medical observations are also useful to confirm the diagnosis. In addition, the child's mobility, speech and assessment of the ability to hear, walk, eat, and digestion of food is also useful to determine the degradation level (Tolkinjonova 2025, p. 64) Numerous methods, including examining health data, self- and parent reporting, disability service providers, education records, and birth and death registrations, are used to identify children for inclusion in CP registries (Goldsmith et al. 2016, p.17) A growing body of research has shown a connection between cytokines and CP risk, despite the fact that the etiology and pathophysiology of CP are not well known (Torres-Merino et al. 2019, p. 1805).

Mothers who were part of the study smoked 18% of the time during pregnancy, and 41% of them were exposed to cigarette smoke throughout pregnancy. Pregnancy-related maternal alcohol use was identified as a risk factor for cerebral palsy (CP) in a Japanese study, and excessive alcohol use was linked to numerous neurodevelopmental abnormalities, including CP (Ichizuka, Toyokawa and Ikenoue 2021, p. 159). Understanding the pathophysiology of CP can be gained by examining the molecular makeup of blood, especially cytokines. Through a number of pathways, increased pro-inflammatory cytokine levels can cause CP and brain damage. First, the blood–brain barrier can be broken down by cytokines, allowing harmful substances to enter the brain. Second, by causing the production of reactive oxygen molecules, cytokines can harm brain cells. Unlike previous research (Go, Saito and Maeda 2021, p. 178).

In a study conducted as a meta-analysis, the risk of CP was found to be 30% higher in infants of mothers with chronic diseases (hypertension, diabetes, asthma, rheumatoid arthritis, multiple sclerosis, epilepsy, thyroid disorder) (Strom, Tollanes and Wilcox 2021, p. 1139). According to the mothers' declarations in our study, these families' income levels were low (73.3%) and moderate (24.8%), and their poor socioeconomic status was a notable risk factor for cerebral palsy. Pregnancy-related malnutrition can result in a variety of physiological and metabolic issues, emaciation, low birth weight, and circumstances that endanger the health of the unborn child, including chronic illnesses Gunaydin (2021, p. 155). When a person has cerebral palsy, it indicates that they are unable to utilize certain of their bodily muscles normally due to a brain damage. It is a set of conditions caused by non-progressive injury to the juvenile brain tissue that impair posture, mobility, and muscle tone. The most prevalent and well-known neurodevelopment motor impairment in children is cerebral palsy. Early in life, often during fetal development or infancy, cerebral palsy-related deficits initially manifest. (Kaur et al. 2011, p. 47). A combined prevalence rate of 0.8 per 10,000 live births of children with Post neonatally acquired Cerebral Palsy in high-income countries (McIntyre et al. 2022, p. 1495).

The chronic condition known as cerebral palsy (CP) is characterized by non-progressive symptoms and is brought on by injury to the very young brain. It first appears in childhood. Motor function dysfunction is the main symptom of cerebral palsy (Adouga et al. 2015, p. 2). In a study conducted with 207 children with CP in Moldova, CP-related disorders were found to be 59% mental retardation, 23% vision problems, 45% speech problems, 5% hearing problems, and 50% epilepsy (Gincota Bufteac, Andersen and Torstein 2018, p. 332). According to the Australian Cerebral Palsy Register, 1 in 700 Australian children are born with or develop cerebral palsy, a 40% decrease in recent decades Cerebral Palsy. In contrast, between 29 days and 2 years after neonatal acquired CP, a damage to the developing brain has been found in about 6% of all children with CP in Australia (Waight, McIntyre and Woolfenden 2023, p. 107). After evaluating the literature, we discovered that particular reporting and a lack of standardization hindered the best use of the data that was available (for example, meta-analyses of uncontroversial continuous variables like maternal age, parity, or birthweight could not be completed). 38 risk variables for CP were found throughout four eras, and the consistency of the results was assessed while acknowledging these

limitations. Results from the study are presented for two groups: those with a denominator of just term CP and those with a denominator of all CP. The degree of correlation between term CP and total CP varied for the majority of risk variables (Johnson et al. 2012, p. 90). Previous research has demonstrated that mother sadness and anxiety during pregnancy have a detrimental effect on the development of a child's personality and IQ. Even if the psychological issues of the parents are subclinical, children who grow up in households with such issues are more likely to experience social-emotional behavior issues (Snyder, Gewirtz and Schrepferman 2016, p. 950). In our study, mental retardation was 52.4%, vision problems 37.6%, hearing problems 16.2%, speech problems 58.1%, and active epilepsy 29.5% among CP-related disorders. In a study conducted in Uganda, the use of assistive devices in children with CP was shown to be very low and it was reported that only wheelchairs were used as an assistive device (Andrews, Kakooza-Mwesige and Almeida 2020, p. 454)

However, risk factors such as older maternal age at delivery, prior maternal disease, pre-eclampsia, and birth defects were not associated with different risk, and thus may be on causal paths to CP irrespective of gestational age at birth. In fact, these factors may work together, as high maternal age is also associated with a higher incidence of birth defects, pre-eclampsia, vascular disease, and pre-existing maternal diseases such as thyroid disorders (Salem et al. 2011, p. 758). The father's social and familial roles are especially significant in families with children who have cerebral palsy. Paternal depression and anxiety have a direct impact on social and familial engagement, as well as the family environment, which in turn affects the emotional condition, mindset, and behaviors of the children (Esposito et al. 2015, p. 45).

To help fathers deal with the challenges in their children's development, extra attention should be given to the adjustment and intervention of the paternal psychological state in parenting activities for children with cerebral palsy. Additionally, the children's and their parents' psychological counseling should be integrated with the treatment of limb function recovery (Sanders et al. 2015, p. 405). A significant risk factor for cerebral palsy has also been discovered as birth history. According to the study, 54% of children with cerebral palsy were born preterm, 39% were born at full term, and 7% were born after term. According to (Blair & Nelson 2015, p. 3), 45% of mothers had longer labour, 54% had shorter labour, and 1% had abrupt labour. Young children's socio-emotional

development lays the groundwork for the formation of positive social skills and healthy personality traits. Children's psychological behavior issues are linked to a number of factors, including the family environment, parental education, mental health conditions, and mental health during pregnancy. While there was no significant difference in the externalizing domain, the dysregulation domains in preterm babies were considerably lower than those in healthy children, Similarly, that preterm children's social ability ratings were noticeably lower than those of healthy children (Cheong et al. 2017, p. 206). The kind of birth attendant is one of the most important determinants in the development of cerebral palsy. This study found that 55% of children with cerebral palsy were born naturally, whereas 45% were delivered via caesarian section. 30% of births were performed by physicians, 20% by nurses, 25% by midwives, and 25% by those with no professional training (MacLennan, Thompson, & Gecz 2015, p. 780). Consanguineous marriage is mentioned as a risk factor for cerebral palsy in numerous research in the literature. A consanguineous marriage produced 51% of the children in our study. Unfortunately, our nation's Southeastern Anatolia region has a high percentage of consanguineous marriages. The rate of consanguineous marriage in southeast Anatolia was estimated to be 43% based on data from Turkey's population and health surveys conducted in 2018 (Keramat, Khalily and Bhutta 2022, p. 1317).

Compared to healthy newborns, preterm infants are vulnerable to impaired white and gray matter in the brain, periventricular leukomalacia, overactivated micro- glial cells and opened astrocyte channels. These changes in the brain result in the release of ATP and the activation of purinergic receptors as well as the proliferation of pro-inflammatory microglial cells associated with early damage. (Mallard et al. 2014, p. 2). We also used a multivariate logistic regression approach to further examine the risk variables linked to the positive categories for the social-emotional development scale. Our findings demonstrated a strong correlation between issues appearing in several aspects of the children's social emotions and the emotional state and educational attainment of the parents. The competence and externalizing domains in children were more significantly impacted by perinatal variables than the other domains. The dimensions of internalizing and dysregulation were more significantly impacted by parental emotion and coping strategies. As their children's primary guardians, parents deliberately or subconsciously share their own experiences, knowledge, and emotions with them through interactive conversation (Filce et al. 2015, p. 241). Interestingly, the

incidence of intrapartum complications and perinatal death at term is also higher in older mothers (Pasupathy et al. 2011, p. 244). The study also looked at how long it took babies to cry after birth, which might indicate birth asphyxia. According to the findings, 40% of children cried immediately after birth, 35% cried after 5-10 minutes, 12% cried between 30 minutes and 1 hour, and 13% cried for more than an hour. Furthermore, 60% of the children sustained a head injury at birth, while 40% did not. These findings are consistent with the research conducted by (Eunice and Onike 2015, p. 7). Previous research has demonstrated that mother sadness and anxiety during pregnancy have a detrimental effect on the development of a child's personality and IQ. Even if the psychological issues of the parents are subclinical, children who grow up in households with such issues are more likely to experience social-emotional behavior issues (Snyder et al. 2016, p. 948).

The diagnosis is made based on the patient's medical history, physical examination, and laboratory results. Since various symptoms and clinical findings coexist, treating CP requires teamwork across multiple areas of expertise. Lifelong medical care, physical therapy, rehabilitation services, special education, psychological counseling, and family counseling are all necessary components of the treatment regimen. Therefore, it is crucial to reduce avoidable risk factors in order to lessen the moral and financial burden that they will place on the individual, family, and society (Vitrikas, Dalton and Breish 2020, p. 215).

Numerous social family elements, including parenting style, family dynamics, and economic circumstances, are correlated with the educational attainment of parents. Children's emotional problems could be more affected by these circumstances. In this regard, we support a general parenting approach that contributes to the development of a favorable home setting and atmosphere for the kids. It's crucial to pay attention to kids, provide them with the right kind of knowledge and linguistic stimulation, and offer them the support and direction they need. The social and emotional development of kids can be greatly enhanced by this method (Pol et al. 2016, p. 1022). Further investigation revealed that 60% of children with cerebral palsy had a birth injury, whereas 40% did not have one. Complications after delivery were distributed as follows: 11% of the youngsters had jaundice, 8% had dehydration, 7% had pneumonia, and 40% had seizures. Furthermore, 1% experienced other complications, 3% had both

jaundice and pneumonia, 4% had dehydration with seizures, 7% had jaundice with seizures, 1% had jaundice, pneumonia, and seizures all at the same time, 6% had pneumonia with seizures, and 12% had no complications after birth (Hasegawa et al. 2016, p. 796). The competence and externalizing domains show how well people are able to control and manage their emotions. According to this study, perinatal influences had a greater impact on the externalizing and competence domains' positive difficulties in children than on other domains (Michelsen et al. 2015, p. 775).

According to the 2013 Australian Cerebral Palsy Register Report, cerebral palsy is a significant global public health issue. 2.5 out of every 1000 live births is the overall prevalence of CP. Since there are infants who pass away during the newborn and infant stages due to brain injuries, and an unknown percentage of them would have satisfied the criteria for cerebral palsy had they lived, it is impossible to determine the actual incidence of cerebral palsy. Muscle stiffness, low muscle tone, uncontrollable movements, and issues with posture, balance, coordination, walking, speaking, swallowing, and many other abilities are common symptoms of cerebral palsy's motor abnormalities. Sensation, cognition, communication, perception, and behavior are frequently affected, as are musculoskeletal issues and epilepsy. With the exception of extreme cases, it may also be regarded as a non-life-threatening condition when the children are born. According to a recent research, cerebral palsy encompasses a range of illnesses that are caused by diverse causes acting at different periods in fetal development and have both orthopedic and neurologic manifestations. Neurodevelopmental deficits, which do not impact movement or posture, are not included (Kuijper et al. 2020, p. 618).

CHAPTER - III: METHODOLOGY

3.1 Study Design:

This was a descriptive type of cross-sectional study to identify and describe the factors associated among children with cerebral palsy attending in selected hospital and rehabilitation center in Dhaka district.

3.2 Study Area:

The data for this study were collected from Firoza Bari Disabled Hospital, Topkhana Road, Dhaka, which is a specialized healthcare and rehabilitation center for the children with disabilities. These hospitals were chosen due to their accessibility, diverse patient population, and reputation for providing specialized pediatric services. Bangladesh Shishu Hospital and Institute, Sher-e-Bangla Nagar, Dhaka-1207, Bangladesh, which specialized hospital for pediatric services and Suraksha Health Care, Dogarmora, C.R.P Road, Savar, Dhaka. Which is a specialized healthcare and rehabilitation center for the disabled group.

3.3 Study Place:

The present study was conducted at Saic College of Medical Science and Technology (SCMST) at Mirpur in Dhaka.

3.4 Study Period:

The duration of the study was one year from July 2024 to June 2025.

3.5 Study Population:

For this study, the study population were children with cerebral palsy, but data were taken from their participants and caregivers. This population was selected for getting accurate information about children with cerebral palsy. The child who was come for treatment at Firoza Bari Disabled Hospital, Bangladesh Shishu Hospital, and Suraksha Health Care.

3.6 Sample Size:

The sample size of the study was calculated by the following statistical formula-

Formula:

$$n = \frac{Z^2 pq}{d^2}$$

$$= \frac{1.96^2 \times 0.34 \times 0.66}{0.05^2}$$

$$= \frac{3.84 \times 0.68 \times 0.66}{0.0025}$$

$$= 344.8$$

Here:

Z (confidence interval) =1.96

p (prevalence) = 0. 34 (Khandaker et al. 2019, p. 601)

d (margin of error) =0.05

And, *q* = (1-*p*)

= (1-0.34)

= 0.66

The actual sample size was, n = 344.8

So, the researcher aims to focus her study by 345 sample following the calculation above initially.

Due to time and funding limitation, I cannot take all the sample that's why I included 203 sample.

3.7 Sampling Technique:

Convenience sampling method was adopted to select the children with cerebral palsy from Firoza Bari Disabled Hospital, Bangladesh Shishu Hospital and Institute and Suraksha Health Care.

3.8 Selection criteria of the participants

3.8.1 Inclusion criteria:

1. Children diagnosed with cerebral palsy (CP) aged 0-12 years (Narayan et al. 2022, p. 5).
2. Children receiving care at hospitals or physiotherapy centers in Dhaka (Shahriar et al. 2019, p. 270).
3. Children with complete medical and perinatal history available from mothers or guardians (Wu et al. 2022, p. 698).
4. Children whose mothers consented to participate in the study (Badawi et al. 2020, p. 6).
5. Children living with families in Dhaka at the time of data collection (Shahriar et al. 2019, p. 271).

3.8.2 Exclusion criteria:

1. Child's guardian who will not be willing to participate.
2. Undiagnosed patient.
3. Children with incomplete or missing clinical data.
4. Children with neural tube defects affecting only the spine, without accompanying brain involvement, are usually excluded.
5. A severe intellectual disability or having undergone surgery in the previous six months.

3.9 Method of Data collection

3.9.1 Techniques of data collection:

Face to face formal interview was applied to collect data from the participants.

3.9.2 Instrument and tools of data collection

Data collection was done by using a structured questionnaire. It contains 8 parts and 49 items. Part A and B contains personal and socio-demographic information, Part C contains nature of disorder, Part D and E contains maternal behavioral factors and pregnancy and delivery-related information, Part F, G and H contains prenatal, perinatal and postnatal factors.

Interpretation of the questionnaire:

The structured questionnaire divided into 8 parts.

Part A: Personal information of the participants such as child's name, mother's name, permanent address, mobile number.

Part B: Socio-demographic information such as age, gender, living area, and occupation of mothers etc.

Part C: contains nature of disorder.

Part D: Maternal behavioral factors (before and during pregnancy) like smoke, drugs and alcohol use.

Part E: Pregnancy and delivery-related information like how many children, gestation period, duration of labor pain and previously had disabled child.

Part F: Prenatal factors (before birth)

Part G: Perinatal factors (during labor and delivery)

Part H: Postnatal factors (within one month after birth).

Tools of Data Collection Questionnaire:

A structured questionnaire.

3.10 Procedure of data collection:

The researcher obtained permission from the Ethical Review Board of Saic College of Medical Science and Technology to carry out the study. A written permission was also taken from the concerned authority of firozabari disable hospital in Dhaka, Bangladesh Shishu Hospital and Institute, Sher-e-Bangla Nagar, Dhaka-1207 and Suraksha Health Care, Dogarmora, C.R.P Road, Savar, Dhaka. After that the researcher approached the cerebral palsy and the aim and objectives of the study was explained in details to them. Interested caregivers were included in the study. Participants were asked to fill up written consent form with their signature to ensure volunteer participation. They were informed about the privacy and confidentiality of the information. Then the researcher started interview with the participants by using the questionnaire. The interview was in a cordial environment. At the end of the interview, the researcher thanked the participants.

3.11 Data Editing:

After data collection, the completed questionnaires were extensively reviewed for mistakes or inconsistencies in the responses. Any missing or unclear information was explained by reviewing the replies and, if necessary, following up with participants. Corrections were made where needed to assure the data's correctness and completeness.

3.12 Data Entry:

The coded data were entered into a computer based on the variables of the study.

3.13 Data Analysis:

The data were analyzed using the Statistical Package for the Social Sciences (SPSS) program. Descriptive statistics such as frequency, distribution, range, mean and percentage were performed. Inferential statistics were used to analyze the relationship between independent and dependent variables.

3.14 Ethical Consideration:

Strict adherence to ethical guidelines is paramount in this study. A formal project proposal was submitted to the Department of Physiotherapy at Saic College of Medical Science and Technology (SCMST), and approval was obtained from the Institutional Review Board (IRB) of SCMST to conduct the study. This research follows the ethical principles outlined by the World Health Organization (WHO) and the Bangladesh Medical Research Council (BMRC), ensuring the confidentiality and protection of participant information at all times. Prior to data collection, permission was obtained from the relevant authorities in the study area. Caregivers and parents of children with cerebral palsy were fully informed about the aims and objectives of the study, as well as the expected time required for participation. Written consent was obtained from each caregiver or parent, with the consent process explained verbally to ensure understanding. Participants were assured of the confidentiality of the information provided, which would only be accessed by the researcher and the academic supervisor. All respondents were informed of their rights, including the option to withdraw from the study at any stage without any adverse consequences. To ensure anonymity, no participant names or identifiable personal details were recorded; instead, unique identification codes were assigned to each participant for all data and transcripts. It was clearly explained that study findings may be used in academic presentations, seminars, or published papers, but in a manner ensuring no individual participant could be identified, and that participation would cause no harm. Furthermore, participants were informed of their right to raise any concerns about the research with senior authorities if needed. These ethical standards were upheld to ensure the safety, dignity, and welfare of all participants while maintaining the integrity and confidentiality of the research process.

CHAPTER - IV: RESULTS

For the purpose of this research, a total of 203 children with cerebral palsy were included from Dhaka city and its surrounding areas. The results of this investigation are summarized in the following paragraphs. The researcher collected descriptive data and calculated percentages, which were then presented in various bar graphs, pie charts, and tables. Individual results of the socio-demographic information (such as age, Gender, living area, parental education, and occupation) and family-related economic information are shown in different tables. The association between socio-demographic factors, economic status, and other potential associated factors of children with cerebral palsy is also presented in tabular form.

4.1 Socio-Demographic Information

Table no.1: Frequency distribution of according to socio-demographic variables.

(n= 203)

Variables	Category	Frequency (N)	Percentage (%)
Age in years	<1	5	2.5
	1-2.11	67	33.0
	3-5.11	73	36.0
	6-8.11	32	15.8
	9-12	26	12.8
Age overall (Mean ± SD) 4.528 ± 2.9347			
Gender	Male	106	52.2
	Female	97	47.8
Living area	Urban	51	25.1
	Semi-urban	25	12.3
	Rural	127	62.6

Education level of mother	Primary	16	7.9
	Secondary	63	31
	SSC	66	32.5
	HSC	39	19.2
	Graduate	6	3
	Postgraduate	11	5.4
	Others	2	1
Mother's occupation	Housewife	200	98.5
	Teacher	2	1.0
	Service	1	.5
Father's occupation	Farmer	12	5.9
	Teacher	1	.5
	Laborer	32	15.8
	Service	58	28.6
	Chemical factory worker	3	1.5
	Business	47	23.2
	Others	50	24.6
Monthly expenditure	10000-30000	108	53.2
	31000-50000	81	39.9
	>50000	14	6.9
	Total	203	100.0

Monthly expenditure overall (Mean ± SD) 35044.33 ± 16382.586.

Regarding the frequency distribution of the total participants (n=203) 100% various type of disorders in children. Age: Under 1 year of age 2.5% (n=5), 1-2.11 years 33% (n=67), Most children were aged between 3 and 5.11 years 36% (n=73), with 15.8% (n=32), were in the 6-8.11 years age group, while 12.8% (n=26) were aged 9–12 years. The average age was 4.528 ± 2.9347 years. Gender: The sample was slightly male-dominated with 52.2% (n=106) males and 47.8% (n=97) females. Living Area: Majority lived in villages 62.6% (n=127), followed by city residents 25.1% (n=51) and semi-urban areas 12.3% (n=25). Mother's Education Level: Most mothers had secondary 31.0% (n=63) or SSC-level education 32.5% (n=66). Smaller proportions had primary 7.9% (n=16), HSC 19.2% (n=39), graduate 3.0% (n=6), postgraduate 5.4% (n=11), or other education 1.0% (n=2). Mother's Occupation: Predominantly housewives 98.5% (n=200), with very few working as teachers 1.0% (n=2) or in service 0.5% (n=1). Father's Occupation: Service workers 28.6% (n=58), business owners 23.2% (n=47), laborers 15.8% (n=32), farmers 5.9% (n=12), chemical factory workers 1.5% (n=3), teachers 0.5% (n=1), and others 24.6% (n=50). Monthly Expenditure: Over half 53.2% (n=108) had monthly expenditure between 10,000 and 30,000. 39.9% (n=81) between 31,000 and 50,000. 6.9% (n=14) above 50,000. The average monthly expenditure was 35044.33 ± 16382.586 (scale or units unspecified), (Table no. 1).

Table no.2: Frequency distribution of the participants age at diagnosis.

Variables	Category	Frequency (N)	Percentage (%)
Age at diagnosis	<1	183	90.1
	1-5	20	9.9
	Total	203	100.0

The study showed that the majority 90.1% (n=183) participants were diagnosed before 1 year of age and a small group 9.9% (n=20) participants were diagnosed between 1 to 5 years of age (Table no. 2).

Table no.3: Frequency distribution of the participants by maternal age.

Maternal age	<18	21	10.3
	18-26	146	71.9
	27-35	27	13.3
	>35	9	4.4
	Total	203	100.0

Regarding the frequency distribution of participants by maternal age, it was found that most mothers were aged between 18 and 26 years, accounting for 71.9% (n=146). Mothers younger than 18 years made up 10.3% (n=21). Those aged 27 to 35 years represented 13.3% (n=27), while mothers over 35 years were the smallest group at 4.4% (n=9), (Table no. 3).

Figure no. 1: Frequency distribution of the participants by married to cousin.

The study showed that 17.2% (n=35) married to cousin, while the majority, 82.8% (n=168), did not married to cousin. this shows that many participants hade cousin married relation, but most did not.

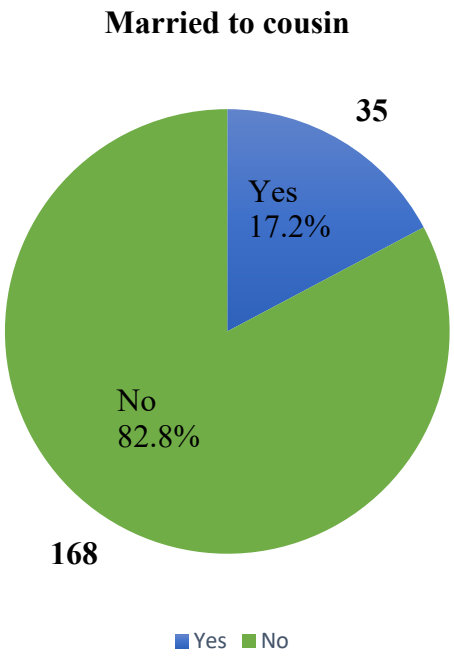


Figure: Frequency distribution of the participants by married to cousin.

Table no.4: Frequency distribution of the participants by pregnancy order.

Variables	Category	Frequency (N)	Percentage (%)
Pregnancy order	< 2	94	46.3
	2-3	106	52.2
	> 3	3	1.5

The study revealed that most pregnancies were the second or third pregnancy, accounting for 52.2% (n=106). Pregnancies less than the second accounted for 46.3% (n=94), while pregnancies beyond the third were rare, representing 1.5% (n=3), (Table no. 4).

Table no.5: Frequency distribution of the participants by gestation period.

Gestation period	>37 weeks (Preterm)	55	27.1
	37 weeks (Term)	122	60.1
	40 weeks (Full term)	22	10.8
	< 40 weeks (Post term)	4	2.0
	Total	203	100.0

Regarding gestation period, 60.1% (n=122) of pregnancies reached term at 37 weeks. Preterm births (below 37 weeks) accounted for 27.1% (n=55). Full term at 40 weeks occurred in 10.8% (n=22), while post-term pregnancies (above 40 weeks) were rare, at 2.0% (n=4), (Table no. 5).

Figure no. 2: Frequency distribution of the participants by regularity check-up.

The study showed that most of the participants 73.9% (n=150) attended their check-ups regularly, whereas 26.1% (n=53) had irregular check-ups. this shows that the majority followed proper health monitoring, but some still missed regular visits, which may affect their baby's condition in cerebral palsy.

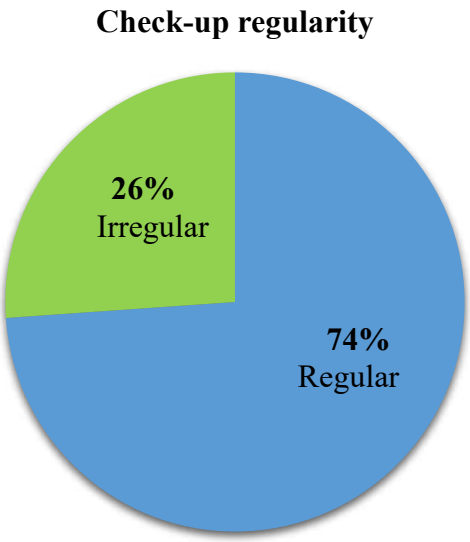


Figure no. 1: Frequency distribution of the participants by regularity check-up.

Table no. 6. Frequency distribution of the participants by Labor duration.

Labor duration	< 6 hours	72	35.5
	6 -18 hours	112	55.2
	> 18 hours	19	9.4

The study showed that labor duration varied among participants, the majority of mothers labor duration between 6 to 18 hours 55.2% (n=112). Labors shorter than 6 hours accounted for 35.5% (n=72), while prolonged labor lasting more than 18 hours was less common at 9.4% (n=19), (Table no. 6).

Table no. 7. Frequency distribution of the participants by Mode of delivery and Pregnancy type.

Variables	**Category**	**Frequency (N)**	**Percentage (%)**
Mode of delivery	Normal	110	54.2
	Cesarean	93	45.8
Pregnancy type	Single	180	88.7
	Twin	23	11.3
	Total	203	100.0

Among the participants, just over half (54.2%) had a normal vaginal delivery, while (45.8%) delivered by cesarean section. Regarding pregnancy types, the majority were single pregnancies (88.7%). Twin pregnancies accounted for (11.3%) of the cases (Table no. 7).

Table no. 8. Frequency distribution of the mothers by delivery attendant.

Delivery attendant	Midwife	3	1.5
	Doctor	119	58.6
	Nurse	41	20.2
	Traditional Birth Attendant	40	19.7

The study showed that more than half of the deliveries 58.6% (n=119) were conducted by doctors. Deliveries attended by nurses accounted for 20.2% (n=41), while 19.7% (n=40) were conducted by traditional birth attendants. Only 1.5% (n=3) of deliveries were attended by midwife (Table no. 8).

Table no. 9. Frequency distribution Family History of Disability.

Previous disabled child	Yes	7	3.4
	No	196	96.6
Disabled child in family	Yes	3	1.5
	No	200	98.5
Disabled child in father's family	Yes	4	2.0
	No	199	98.0

The study showed that Previous Disabled Child: 3.4% (n=7) of the mothers had a previous child with a disability, while 96.6% (n=196) did not. Disabled Child in the Family: 1.5% (n=3) reported having a disabled child within their family, whereas 98.5% (n=200) did not. Disabled Child in the Father's Family: 2.0% (n=4) had a report of a disabled child in the father's family, compared to 98.0% (n=199) who did not (Table no. 9).

Table no.10. Frequency distribution of the mothers by miscarriage history.

Variables	Category	Frequency (N)	Percentage (%)
Miscarriage history	Yes	20	9.9
	No	183	90.1

Among the mothers, 9.9% (n=20) had a history of miscarriage, while the majority, 90.1% (n=183), did not report any previous miscarriage (Table no. 10).

Table no. 11. Frequency distribution maternal health conditions during pregnancy:

Variables	Category	Frequency (N)	Percentage (%)
Hypothyroidism	Yes	16	7.9
	No	187	92.1
High blood pressure	Yes	11	5.4
	No	192	94.6
Anemia during pregnancy	Yes	15	7.4
	No	188	92.6
Diabetes during pregnancy	Yes	12	5.9

	No	191	94.1
Blood disorder	Yes	8	3.9
	No	195	96.1
Lung disease	Yes	7	3.4
	No	196	96.6
Urinary infection	Yes	37	18.2
	No	166	81.8
Asthma	Yes	19	9.4
	No	184	90.6
Fall down during pregnancy	Yes	26	12.8
	No	177	87.2
Any other illness during pregnancy	Yes	5	2.5
	No	198	97.5
	Total	203	100.0

The study showed that mothers had hypothyroidism during pregnancy 7.9% (n=16), while 92.1% (n=187) did not. Mothers experienced high blood pressure 5.4% (n=11), whereas 94.6% (n=192) did not. Mothers had anemia 7.4% (n=15), and 92.6% (n=188) did not. Mothers reported diabetes during pregnancy 5.9% (n=12), while 94.1% (n=191) did not. Mothers had blood disorders 3.9% (n=8), compared to 96.1% (n=195) who did not. Mothers reported lung disease 3.4% (n=7), while 96.6% (n=196) did not. Experienced urinary infections 18.2% (n=37), and 81.8% (n=166) did not. Mothers had asthma 9.4% (n=19), while 90.6% (n=184) did not. Mothers reported falling during pregnancy 12.8% (n=26), whereas 87.2% (n=177) did not. Mothers experienced other illnesses during pregnancy 2.5% (n=5), while 97.5% (n=198) did not (Table no. 11).

Table no. 12. Frequency distribution Perinatal and Birth-Related Characteristics:

Variables	Category	Frequency (N)	Percentage (%)
Head injury	Yes	103	50.7
	No	100	49.3
Breathing difficulty	Yes	79	38.9
	No	124	61.1
When did the child cry after birth?	Immediately	61	30.0
	After 5–10 minutes	89	43.8
	Didn't cry	53	26.1
Child's birth weight	Normal (2.5 kg)	95	46.8
	Low (<2.5 kg)	24	11.8
	Overweight	84	41.4
Any other complications	Yes	5	2.5
	No	198	97.5

Total	203	100.0

The study showed that around half of the children **(**50.7%**,** n=103) had a history of head injury, while 49.3% (n=100) did not. 38.9% (n=79) of the children experienced breathing difficulties at birth, whereas 61.1% (n=124) did not have such issues. The largest proportion of children **(**43.8%**,** n=89) cried after 5–10 minutes of birth. 30.0% (n=61) cried immediately**,** and 26.1% (n=53) did not cry at all after birth. Nearly half of the children 46.8% **(**n=95) had a normal birth weight (2.5 kg), 11.8% (n=24) had low birth weight (<2.5 kg), and 41.4% (n=84) were classified as overweight. Only 2.5% (n=5) of the children had other complications at birth, while 97.5% (n=198) had no additional complications (Table no. 12).

Table no. 13. Frequency distribution Neonatal Morbidity Characteristics:

Variables	Category	Frequency (N)	Percentage (%)
Baby hade jaundice	Yes	47	23.2
	No	156	76.8
Baby have pneumonia	Yes	60	29.6
	No	143	70.4
Baby have seizures	Yes	126	62.1
	No	77	37.9
	Total	203	100.0

Regarding the frequency distribution of participants by sewing Neonatal Morbidity Characteristics, Among the babies, 23.2% (n=47) were reported to have jaundice, while 76.8% (n=156) did not experience jaundice. A total of 29.6% (n=60) of the babies had pneumonia, whereas 70.4% (n=143) did not have the condition. Out of the total babies, 62.1% (n=126) experienced seizures, whereas 37.9% (n=77) did not have seizures (Table no. 13).

Figure no. 3: Frequency distribution of the participants by oxygen support need.

The study showed that out of the 203 babies, 40.9% (n=83) required oxygen support after birth, while the majority, 59.1% (n=120), did not require oxygen. this shows that many babies faced breathing difficulties at birth, but most did not require extra support.

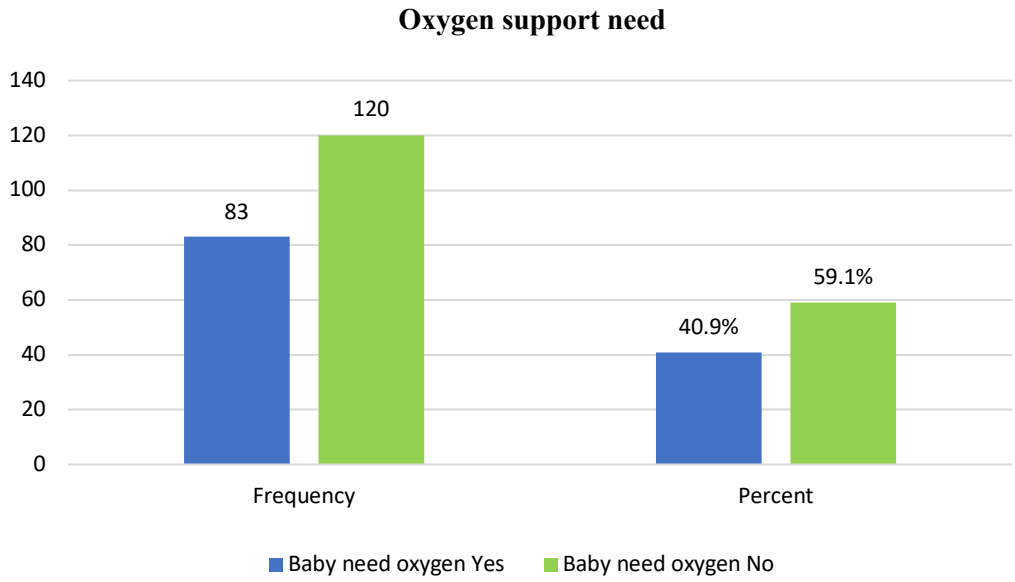


Figure: Frequency distribution of the participants by oxygen support need.

Figure no. 4: Frequency distribution of the participants by need admitted to NICU/ ICU.

The study showed that a total of 29.1% (n=59) of the babies were admitted to the NICU/ICU after birth, whereas 70.9% (n=144) did not require such admission.

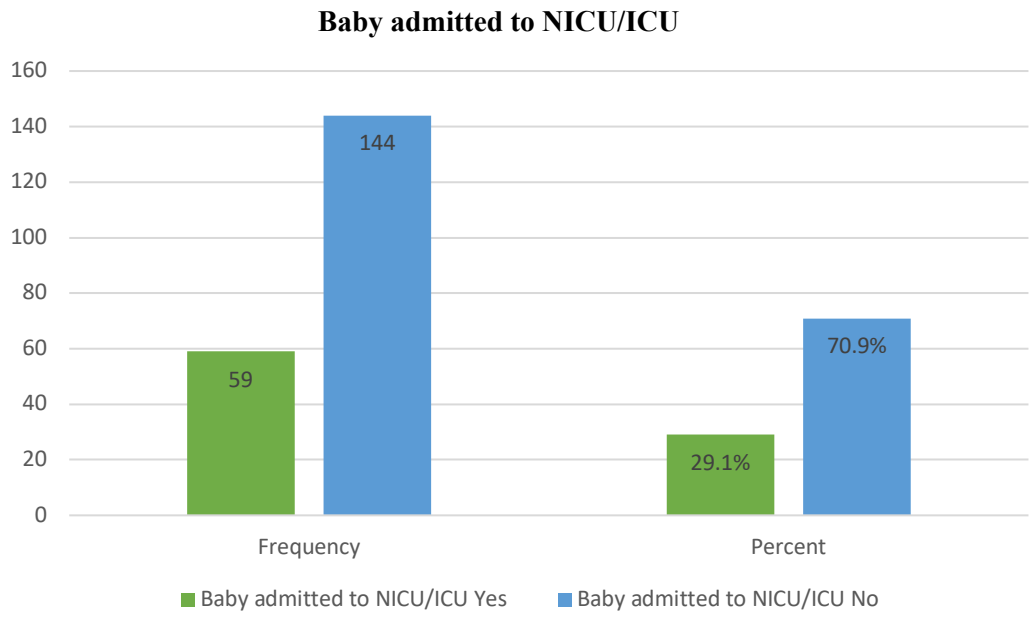


Figure: Frequency distribution of the participants by need admitted to NICU/ ICU.

Table no. 14. Association between cerebral palsy and socio-demographic information.

Association between cerebral palsy and socio-demographic information						
Variables		Cerebral Palsy		Chi-square test	P-value	Comments
		Yes	No			
Maternal age	<18	19	3	12.451	0.053	Significant
	18-26	140	5			
	27-35	25	2			
	>35	9	0			
Family income	10000-30000	104	4	35.274	0.001	Highly significant
	31000-50000	77	4			
	>50000	12	2			

The table demonstrates that the chi-square value for the maternal age group was 12.451, with a p- value of 0.053. As a result, there is a significant association between maternal age and the cerebral palsy among participants. (Value of χ^2: 35.274, p-value: 0.001) The p-value of 0.001 is highly significant, suggesting a highly significant association between the cerebral palsy and family income (Table no. 14).

Table no. 15. Association between cerebral palsy and disease related information

Association between cerebral palsy and disease related information						
Variables		Cerebral Palsy		Chi-square test	P-value	Comments
		Yes	No			
Married to cousin	Yes	30	5	8.745	0.013	Significant
	No	163	5			
Miscarriage history	Yes	18	2	11.728	0.003	Significant
	No	175	8			
Urinary infection	Yes	35	2	6.284	0.043	Significant
	No	158	8			
Disabled child in family	Yes	3	1	15.590	0.001	Highly significant
	No	190	9			
Infant had jaundice	Yes	41	6	8.133	0.017	Significant
	No	152	4			
Infant had seizures	Yes	122	4	3.470	0.176	Not significant
	No	71	6			

The study showed that the chi-square value for the married to cousin was 8.745, with a p- value of 0.013. As a result, there is a significant association between cerebral palsy and married to cousin. The chi-square value for history of miscarriages was 11.728 with a p- value of 0.003, indicating a significant association between the cerebral palsy and the history of miscarriages. The chi-square value for history of urinary infections during pregnancy was 6.284, with a p- value of 0.043, indicating a significant association between the cerebral palsy and urinary infections during pregnancy. The chi-square value for disabled child in family was 15.590, with a p- value of 0.001, indicating statistically highly significant ($p < 0.05$) association between the cerebral palsy and disabled child in family. The chi-square value for infant had jaundice was 8.133, with a p- value of 0.017, indicating a significant association between the cerebral palsy and infant had jaundice. The chi-square value for infant had seizures 3.470, with a p- value of 0.176, indicating there was no significant association between the cerebral palsy and infant had seizures (Table no. 15).

CHAPTER - V: DISCUSSION & LIMITATIONS

5.1 Discussion:

Consanguinity is becoming more widely recognized as a major risk factor for cerebral palsy. 37% of infants with cerebral palsy were born into consanguineous marriages, according to a recent comprehensive assessment of Arabic-speaking nations. Other studies have shown that 16% of children with CP in Bangladesh were born to consanguineous marriages, with similar associations found in Turkish and Syrian populations (Badawi et al. 2025, p. 1110). In this study represents that (p-value: 0.013), The p-value is less than 0.05, indicating a significant association between cerebral palsy and married to cousin, 17.2% shows cousin marriage.

Cerebral Palsy prevalence is reported around 2-3 per 1,000 live births in South Asia. This rate is higher than the usual community-based findings. The higher percentage in this study may be due to data collection mainly from hospitals and rehabilitation centers, where more children with CP come for treatment (Wu, Chen & Zhang 2022, p. 701). This indicates that in Bangladesh, early identification, proper referral, and regular physiotherapy services are very important to reduce long-term disability and improve quality of life for these children.

The mean age of participants in the present study was 4.52 ± 2.93 years. The largest group was children aged 3-5.11 years (36%), followed by 1-2.11 years (33%)., Consistent with international findings where early developmental delay and abnormal tone are commonly observed in infancy (Novak, Morgan & Adde 2017, p. 900). However, a small proportion of cases were diagnosed later, reflecting barriers in access to specialized diagnostic services. Delayed diagnosis has also been highlighted in studies from other low- and middle-income country settings, where limited awareness and lack of trained professionals contribute to under recognition (Oskoui, Coutinho & Dykeman 2019, p. 947)

The present study found that most of the children live in urban areas (62.6%), group homes (25.1%) and semi-urban areas (12.3%). The low rate of births in rural areas may be due to lack of maternal health services and complications during childbirth. Similarly, (Khandaker et al. 2014, p. 365) in their study on CP in Bangladesh noted a higher risk in rural areas.

Advanced maternal age is associated with several adverse obstetric outcomes that may indirectly increase the risk of cerebral palsy (CP). Older mothers have higher rates of prematurity and caesarean delivery, both of which are established contributors to neonatal complications that predispose to CP. In the United States, caesarean section rates are reported to be around 50% in women over 40 years and nearly 80% in those over 50 years, reflecting the strong correlation between maternal age and obstetric risk. Furthermore, children conceived through assisted reproductive therapies, which are more frequently used by older mothers, are at greater risk of prematurity and related morbidities, providing an additional pathway that links maternal age with CP (Hyrapetian, Loucaides and Sutcliffe, 2014, p. 22). On the other hand, in this study regarding the frequency distribution of participants by maternal age, it was found that most mothers were aged between 18 and 26 years, accounting for 71.9% and statistically significant ($p < 0.05$), indicating a relationship between the cerebral palsy and maternal age.

Most mothers had secondary (31.0%) or SSC (32.5%) education; only a few were graduates (3.0%) or postgraduates (5.4%). Most mothers (98.5%) were housewives. Parental education emerged as an important factor in this study. Lower educational levels were associated with delayed treatment-seeking, which aligns with findings from recent studies in India and Sub-Saharan Africa, where maternal education is strongly correlated with healthcare utilization and child health outcomes (Kaur, Singh & Kumar 2022, p. 945). This suggests that awareness campaigns and community education may play a pivotal role in improving CP care.

When we examined specific infection diagnoses, chlamydia was most strongly associated with CP. Trichomoniasis and urinary tract infection were significantly associated with any diagnosis of CP but not confirmed CP. Urinary tract infection during pregnancy is linked with a higher risk of cerebral palsy in children. Studies show that when mothers had genitourinary infections, especially in the first two trimesters, their babies had more chance of developing CP. The risk was strongest in preterm and low-birthweight infants, while it was not significant in full-term normal-weight babies. This suggests that UTI may act together with prematurity and growth restriction to increase CP risk (Mann et al. 2019, p. 284). In Bangladesh, studies have highlighted that UTIs during pregnancy are relatively common, with prevalence ranging from 8% to 12%, in different regions maternal UTI may indirectly contribute to the burden of CP in Bangladesh (Shahriar et al. 2019, p. 270).

In this study represent that all participants 100% (n=203) reported no drug use during pregnancy. Similarly, none of the participants 100% (n=203) reported smoking. In another study have the mother who smoked during pregnancy consisted 18.1% and alcohol use during pregnancy 1.9% (Basaran et al. 2023, p. 4) In this study represent that p-value: 0.043, Statistically significant ($p < 0.05$), suggesting that the cerebral palsy is linked to urinary infections during pregnancy and experienced urinary infections 18.2%. Maternal history of hypertension (5.4%), diabetes (5.9%), anemia (7.4%), hypothyroidism (7.9%), and asthma (9.4%) during pregnancy was found to be associated with an increased risk of CP. Similar associations have been observed globally, with perinatal hypoxia, preterm birth, and infections being among the most consistent risk factors for CP (Patel, Neelakantan & Pandher 2020, p. 946). Preventive strategies targeting maternal health and improved obstetric care remain essential for reducing CP incidence. Head injuries were reported in 50.7% of infants, respiratory distress in 38.9%, and seizures in 62.1% of infants. In addition, 40.9% of infants received oxygen support after birth, and 29.1% were admitted to the NICU/ICU.

A meta-analysis published in (Frontiers in Neurology 2020, p. 5) confirmed that birth asphyxia, indicated by low umbilical cord pH, is associated with an increased risk of CP. The study highlighted that while the exact threshold of metabolic acidosis correlating with CP remains debated, a significant association exists between birth asphyxia and CP outcomes. The Bangladesh Cerebral Palsy Register has been instrumental in understanding the epidemiology of CP in Bangladesh. A study published in (Narayan et al. 2023, p. 7) reported that between January 2015 and February 2022, 3,820 children with CP were registered. The study highlighted those associated impairments, such as intellectual disabilities, were prevalent among these children, 39% of children with ataxia and 37% of children with bilateral spastic CP have epilepsy indicating the multifactorial nature of CP and the importance of comprehensive care.

5.2 Limitations

In this study, certain limitations should be considered when interpreting the findings, results certain restrictions and challenges must be considered:

1. The study used a smaller sample size of 203 children instead of the estimated 345. This may reduce the strength and generalization of the findings.
2. Being a cross-sectional study, data were collected at only one point in time. This design shows associations but cannot prove cause-and-effect relationships.
3. Some information was based on parents' or caregivers' memory and self-reports. This may cause recall bias, making the data less accurate.
4. Several maternal and birth-related factors were not clinically verified. Reliance only on caregiver-reported history may lower data reliability.
5. Socioeconomic and educational aspects were included but not deeply analyzed. Their influence on healthcare access and rehabilitation was not well explained.
6. The study did not follow up with the children after data collection. Long-term outcomes like therapy progress and quality of life were not assessed.

CHAPTER-VI: CONCLUSION & RECOMMENDATIONS

6.1 Conclusion:

This study provides important fresh perspectives into the factors associated among children with cerebral palsy attending in selected hospital and rehabilitation center in Dhaka districts. The estimated sample size was 344.8, data were collected from 203 children, which still provides meaningful evidence about the scale of the problem. However, as this was a hospital and physiotherapy center-based study, the findings may not reflect the actual community prevalence. The study further examined health-related, perinatal, and demographic factors that might be associated with CP. Several variables showed significant associations with the type of disorder, including consanguineous marriage, maternal age, pregnancy type, miscarriage history, urinary tract infection during pregnancy, neonatal jaundice, and the presence of another disabled child in the family. These factors strongly suggest that both genetic and perinatal conditions contribute to the risk of CP. On the other hand, family income, regularity of antenatal check-ups, neonatal pneumonia, NICU admission, oxygen support, and maternal asthma were not significantly associated. The findings emphasize that targeted prevention and maternal health interventions can play a vital role in reducing risk. Maternal health complications during pregnancy, such as hypothyroidism, anemia, diabetes, hypertension, and urinary infections, were also recorded, with urinary tract infection showing a significant link with CP. These findings underline the complex interaction between maternal health, perinatal conditions, and child outcomes. However, the study does have limitations. The relatively small sample size compared to the estimated requirement and reliance on self-reported data may limit the generalizability of results. In addition, the absence of longitudinal follow-up and clinical validation could have influenced the accuracy of associations. Despite these limitations, the study provides valuable evidence on cerebral palsy and its associated factors in Dhaka district. The results highlight the urgent need for early screening, comprehensive maternal healthcare, and awareness programs that target preventable risk factors. Strengthening antenatal and perinatal care, along with community-based rehabilitation and counseling for families, can improve outcomes and reduce the burden of CP in resource-limited settings.

6.2 Recommendations:

1. Public health campaigns and educational programs should focus on raising awareness of cerebral palsy (CP), its early warning signs, and preventable risk factors, particularly targeting parents and families of children in high-risk groups.
2. Maternal healthcare services must be strengthened, especially in rural and semi-urban areas, to ensure regular antenatal check-ups, safe delivery practices, and management of high-risk pregnancies such as multiple gestations or advanced maternal age.
3. Although the estimated sample size was 344.8, data were collected from 203 children. Future studies should include a larger and more representative sample to increase the reliability and generalizability of the findings.
4. The study found significant associations with factors like consanguineous marriage, maternal age, pregnancy type, miscarriage history, UTI, and neonatal jaundice. However, factors such as family income, antenatal check-up regularity, and NICU admission were not significant, highlighting the need to focus on modifiable risks.
5. As the study was hospital and rehabilitation center-based, the results may not reflect the true community prevalence. Further research should include data from rural and urban areas to better understand the overall situation and improve intervention planning.
6. Evaluation of the effectiveness and accessibility of rehabilitation services, parental training, and community-based interventions for children with CP is needed in order to improve overall quality of life and reduce the burden on families.

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Appendix- A

Institutional Review Board (IRB) Permission Letter

Date: 03/09/2024

To

The Chairman,

Institutional Review Board (IRB)

SAIC College of Medical Science & Technology (SCMST)

Mirpur-14, Dhaka-1216.

Subject: **Application for review and ethical approval.**

Dear Sir,

With due respect, I am Md. Abul Hasan, student of 4th year B.Sc. in Physiotherapy Program at SAIC College of Medical Science & Technology (SCMST), affiliated by the University of Dhaka. As per the course curriculum, I have to conduct a research project that entitled "Factors Associated among Children with Cerebral palsy Attending in Selected Hospital and Rehabilitation Center in Dhaka District" under the supervisor Md. Kutub Uddin, Lecturer (Physiotherapy) of SCMST.

The purpose of the study is to determine the factors associated among children with cerebral palsy attending in selected hospital and rehabilitation center in Dhaka district. The study involves face to face interview by using structured questionnaire that may take 15 to 20 minutes to fill the questionnaire and there is no likelihood of any harm to the participants. Related information will be collected from the patient's guidebook. Data collectors will receive informed consent from all participants: any data collected will be kept confidential.

Therefore, I look forward to having your kind approval for the thesis proposal and to start data collection. I can also assure you that I will maintain all the requirements for study.

Sincerely,

Md. Abul Hasan
03-09-2024

Md. Abul Hasan

Student of 4th Year B.Sc. in Physiotherapy

Session:2019-20 Reg: 8827

SCMST, Mirpur-14, Dhaka-1216, Bangladesh

SCMST-BPT/IRB/.....03 - 14/25/42

To
Md. Abul Hasan
4th Year Student of B.Sc. in Physiotherapy
Session: 2019-20, Reg No: 8827
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

Subject: Approval of the thesis proposal **"Factors Associated among Children with Cerebral palsy Attending in Selected Hospital and Rehabilitation Center in Dhaka District"** by ethics committee.

Dear Md. Abul Hasan
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	Structured Questionnaire (English & Bangla version)
3	Information sheet & consent form.

The purpose of the study is to investigate the factors associated among children with cerebral palsy attending in selected hospital and rehabilitation center in Dhaka district. The study involves face to face interview by using structured questionnaire that may take 15 to 20 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 at 09.00 AM on 04th September 2024 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,
04.09.24

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

বাংলাদেশ শিশু হাসপাতাল ও ইনস্টিটিউট
শেরে বাংলা নগর
ঢাকা-১২০৭।

স্মারক নং-বাশিহাই/প্রশাসন/২০২৫/ ৯০০৮ তারিখঃ ১৯.০৫.২৫ইং

প্রতি
মোঃ আবুল হাসান
বি.এসসি ইন ফিজিওথেরাপী (৪র্থ বর্ষ)
সেশনঃ২০১৯-২০২০, রেজিঃ ৮৮২৭
সাইক কলেজ অফ মেডিকেল সাইন্স এন্ড টেকনোলজি
মিরপুর-১৪, ঢাকা-১২১৬।

বিষয়ঃ তথ্য-উপাত্ত সংগ্রহের অনুমতি প্রদান।

উপর্যুক্ত বিষয় এবং আপনার আবেদনের প্রেক্ষিতে জানানো যাচ্ছে যে, পত্র জারির তারিখ হইতে আগামী ০৭ (সাত) কর্মদিবস বাংলাদেশ শিশু হাসপাতাল ও ইনসিটিটিউট এর ফিজিওথেরাপি বিভাগে (ইনডোর এবং আউটডোর) এবং শিশু বিকাশ কেন্দ্রে তথ্য-উপাত্ত সংগ্রহের জন্য নিম্নোক্ত শর্তে অনুমতি প্রদান করা হলো।

১। আপনার কার্যক্রম কোন ভাবে রোগীর সেবা প্রদানে ব্যাঘাত ঘটাতে পারবে না।
২। আপনাকে হাসপাতাল ও ইনস্টিটিউটের নিয়ম অনুয়ায়ী ১,০০০ (এক হাজার) টাকা বাংলাদেশ শিশু হাসপাতাল ও ইনস্টিটিউট এর হিসাব বিভাগে পরিশোধ করিতে হইবে।

অধ্যাপক ডাঃ মোঃ মাহবুবুল হক
পরিচালক
বাংলাদেশ শিশু হাসপাতাল ও ইনস্টিটিউট

অনুলিপিঃ
১। প্রধান, ডিপার্টমেন্ট অব পেডিয়েট্রিক নিউরোসাইন্স, বাশিহাই।
২। উপ-পরিচালক (হাসপাতাল), বাশিহাই।
৩। আবাসিক চিকিৎসক, বাশিহাই।
৪। ইপিডিমিওলজিষ্ট, বাশিহাই।
৫। সহকারী পরিচালক (অর্থ), বাশিহাই।
৬। সিনিয়র ফিজিওথেরাপিষ্ট, বাশিহাই।
৭। পরিচালক মহোদয়ের একান্ত সচিব, বাশিহাই।
৮। জুনিয়র অফিসার (প্রশাসন), বাশিহাই।
৯। জুনিয়র অফিসার (ফিন্যান্স), বাশিহাই।
১০। দপ্তর কপি।

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.beew-bd.org

ফা-ভি-০৮/বাশিকপ২০০৬(প্রশাসন) অংশ-২-প-২৫০ তারিখ : ০৮-০৫-২০২৫

বরাবর
মোঃ আবুল হাসান
শিক্ষার্থী, বিএসসি ইন ফিজিওথেরাপী বিভাগ (রেজিঃ ৮৮২৭, সেশনঃ ২০১৯-২০২০)
সাইক কলেজ অব মেডিকেল সায়েন্স অ্যান্ড টেকনোলজি
সাইক টাওয়ার, এম-১/৬, মিরপুর # ১৪
ঢাকা-১২১৬।

বিষয় : ডাটা কালেকশনের অনুমতি প্রসঙ্গে।
সূত্রঃ ০৩/১৪/২৫/৪২, তারিখ : ০৬/০৫/২০২৫

উপর্যুক্ত বিষয়ে সূত্রোল্লিখিত পত্রের বর্ণনা মতে আপনাকে বাংলাদেশ শিশু কল্যাণ পরিষদ পরিচালিত ফিরোজা বারি প্রতিবন্ধী শিশু হাসপাতালে "Factors Associated among Children with Cerebral Palsy Attending in Selected Hospital and Rehabilitation Center in Dhaka District: A descriptive type of cross-sectional study"-এর 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 মনিরুল আলম
সাধারণ সম্পাদক, বাশিকপ

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

Consent Form (English)

ID Number:				**Date.**			**2025**

Dear Participant,

Assalamu Alaikum. My name is Md. Abul Hasan. The title of my research is "**Factors Associated among Children with Cerebral palsy Attending in Selected Hospital and Rehabilitation Center in Dhaka District**" Through this research, it will be possible to identify the risk factors associated with children affected by cerebral palsy, which will help in taking preventive measures, developing better treatment plans, and raising awareness. This will increase the chances of both mental and physical improvement in children and reduce pressure on families and society. I would like to know some of your personal and related information. You are required to answer some questions mentioned in this form, which will take around 15–20 minutes. A list of questions is provided here, and you are required to answer each one. All information will only be used for research purposes, and the personal details of participants will be kept completely confidential and will not be disclosed elsewhere. Participants may withdraw at any time from the study without any hesitation or risk. I sincerely seek your cooperation.

Participant's Declaration:

I have been informed about this study. The full set of questions has been explained to me, and I have answered without any hesitation. I understand that my participation in this study is entirely voluntary, and I may withdraw at any time without any risk. I give my full consent to participate in this research.

Participant's Name: .....
Child's Mother's Signature: ..... Date: ...../...../2025
Address: .....
Mobile Number: .....

সম্মতিপত্র (বাংলা)

আইডি নম্বর - | | | | তারিখ: | | | ২০২৫ |

প্রিয় অংশগ্রহণকারী,

আসসালামু আলাইকুম, আমি মোঃ আবুল হাসান, আমার গবেষণার শিরোনাম, **"ঢাকা জেলার নির্দিষ্ট হাসপাতাল ও পুনর্বাসন কেন্দ্রে সেরিব্রাল পালসি আক্রান্ত শিশুদের সাথে সম্পর্কিত কারণসমূহ"**। এই গবেষণার মাধ্যমে সেরিব্রাল পালসি আক্রান্ত শিশুদের ঝুঁকিপূর্ণ কারণসমূহ চিহ্নিত করা সম্ভব হবে, যার ফলে আগাম প্রতিরোধমূলক ব্যবস্থা নেওয়া, উন্নত চিকিৎসা পরিকল্পনা তৈরি এবং সচেতনতা বৃদ্ধি করা যাবে। এতে করে শিশুদের মানসিক ও শারীরিক উন্নয়নের সম্ভাবনা বাড়বে এবং পরিবার ও সমাজের ওপর চাপ হ্রাস পাবে আমি আপনার কিছু ব্যক্তিগত ও অন্যান্য সম্পর্কিত তথ্য জানতে চাই। এই ফর্মে উল্লেখিত কিছু প্রশ্নের উত্তর আপনাকে দিতে হবে। এতে প্রায় 15-20 মিনিট সময় লাগবে। এখানে প্রশ্ন মালার একটি তালিকা দেওয়া আছে এবং আপনাকে প্রত্যেকটি প্রশ্নের উত্তর দিতে হবে। এই তথ্য সমূহ শুধুমাত্র গবেষণার কাজে ব্যবহার করা হবে এবং অংশগ্রহণকারীর ব্যক্তিগত তথ্য সম্পন্ন গোপনীয়তার মধ্যে থাকবে, অন্য কোথাও প্রকাশ করা হবে না। গবেষণা চলাকালীন সময়ে অংশগ্রহণকারী কোনরকম দ্বিধা বা ঝুঁকি ছাড়াই যেকোনো সময় এটাকে বাদ দিতে পারবেন। আপনার একান্ত সহযোগিতা কামনা করছি।

অংশগ্রহণকারীর ঘোষণা,

আমাকে এই নিরীক্ষার জন্য জানানো হয়েছে। আমাকে সম্পূর্ণ প্রশ্নগুলো পড়ে বোঝানো হয়েছে এবং আমি কোন ধরনের দিধা ছাড়াই উত্তর দিয়েছি। আমি লক্ষ্য করেছি, এই গবেষণায় আমার অংশগ্রহণ সম্পূর্ণ স্বেচ্ছায় এবং কোন রকম ঝুঁকি ছাড়াই যেকোনো সময় এটাকে বাদ দিতে পারব। আমি এই গবেষণায় অংশগ্রহণের সম্পূর্ণ সম্মতি জ্ঞাপন করছি।

অংশগ্রহণকারীর নাম: .....

বাচ্চার মায়ের স্বাক্ষর: .....তারিখ: ...../..... /২০২৫

ঠিকানা: .....

মোবাইল নাম্বার: .....

Interview Questionnaire (English)

"Factors Associated among Children with Cerebral palsy Attending in Selected Hospital and Rehabilitation Center in Dhaka District"

Respondent ID: | | | |

A. Personal Information

Child's Name:

Mother's Name:

Permanent Address:

Mobile Number:

B. Socio-Demographic Information:

No.	**Question**	**Answer**	Code
1	What is your child's age?	..... years	
2	At what age was your child diagnosed?	..... years	
3	Where do you live?	City - 1 Semi-urban - 2 Village - 3	
4	What is your education level?	Illiterate - 1 Primary - 2 Secondary - 3 SSC - 4 HSC - 5 Graduate - 6 Postgraduate - 7 Others - 8	
5	Are you married to your cousin (paternal/maternal)?	Yes - 1 No - 2	
6	What is your (mother's) occupation?	Housewife - 1 Teacher - 2 Laborer - 3 Service - 4 Garment worker - 5	

		Chemical factory worker - 6 Business - 7 Unemployed - 8 Others - 9	
7	What is the father's occupation?	Farmer - 1 Teacher - 2 Laborer - 3 Service - 4 Garment worker - 5 Chemical factory worker - 6 Business - 7 Unemployed - 8 Others - 9	
8	What is your total monthly family income (husband + wife + sons + daughters)?	..... Taka	

C. Nature of Disorder

No.	Question	Answer	Code
9	What is the name of your child's disease/disorder?	Cerebral Palsy - 1 ADHD - 2 Autism - 3 Down Syndrome - 4 Spina Bifida - 5 Hydrocephalus - 6 Microcephaly - 7 Other developmental delay - 8	

D. Maternal Behavioural Factors (Before and During Pregnancy)

No.	Question	Answer	Code
10	Did you use addictive substances (drugs) during pregnancy?	Yes - 1 No - 2	
11	Did you consume alcohol during pregnancy?	Yes - 1 No - 2	
12	Did you smoke during pregnancy?	Yes - 1 No - 2	

E. Pregnancy and Delivery-Related Information

No.	Question	Answer	Code
13	How many children do you have?		
14	Which number pregnancy was this?		
15	How old were you during this pregnancy?	..... years	
16	Specify gestation period:	Preterm (<37 weeks) - 1 Term (37 weeks) - 2 Full-term (40 weeks) - 3 Post-term (>40 weeks) -4	
17	Did you go for regular check-ups during pregnancy?	Yes - 1 No - 2	
18	If yes, specify:	Regular - 1 Irregular - 2	
19	What was the mode of delivery?	Normal - 1 Cesarean - 2	
20	Duration of labor pain?	Short (<6 hrs) - 1 Normal (6–18 hrs) - 2 Prolonged (>18 hrs) - 3	
21	What was the type of pregnancy?	Single - 1 Twin - 2 Triplet - 3 More - 4	
22	Who conducted the delivery?	Midwife - 1 Doctor - 2 Nurse - 3 Traditional Birth Attendant - 4 Others - 5	
23	Did you previously have a disabled child?	Yes - 1 No - 2	
24	Was there any disabled child in your family?	Yes - 1 No - 2	
25	Was there any disabled child in the father's family?	Yes - 1 No - 2	
26	Did you have any previous miscarriages?	Yes - 1 No - 2	

27	If yes, how many times?		

F. Prenatal Factors (Before Birth)

No.	Condition	Answer	Code
28	Hypothyroidism	Yes - 1 No - 2	
29	High blood pressure during pregnancy	Yes - 1 No - 2	
30	Anemia during pregnancy	Yes - 1 No - 2	
31	Diabetes during pregnancy	Yes - 1 No - 2	
32	Blood disorder	Yes - 1 No - 2	
33	Lung disease	Yes - 1 No - 2	
34	Urinary infection	Yes - 1 No - 2	
35	Asthma	Yes - 1 No - 2	
36	Did you fall during pregnancy?	Yes - 1 No - 2	
37	Any other illness during pregnancy?	Yes - 1 No - 2	

G. Perinatal Factors (During Labor and Delivery)

No.	Question	Answer	Code
38	Did the child have a head injury at birth?	Yes - 1 No - 2	
39	Was there any breathing difficulty at birth?	Yes - 1 No - 2	
40	When did the child cry after birth?	Immediately - 1 After 5–10 minutes - 2 Didn’t cry - 3	

41	What was the child's birth weight/	Normal (2.5 kg) - 1 Low (<2.5 kg) - 2 Overweight - 3	
42	Were there any other complications?	Yes - 1 No - 2	
43	If yes, please specify:		

Postnatal Factors (Within One Month After Birth):

No.	Question	Answer	Code
44	Did the baby have jaundice?	Yes - 1 No - 2	
45	Did the baby have pneumonia?	Yes - 1 No - 2	
46	Did the baby have seizures?	Yes - 1 No - 2	
47	Did the baby need oxygen?	Yes - 1 No - 2	
48	Was the baby admitted to NICU/ICU?	Yes - 1 No - 2	
49	If yes, please specify:		

"ঢাকা জেলার নির্দিষ্ট হাসপাতাল ও পুনর্বাসন কেন্দ্রে সেরিব্রাল পালসি আক্রান্ত শিশুদের সাথে সম্পর্কিত কারণসমূহ"

সাক্ষাৎকার প্রশ্নাবলি (বাংলা)

উত্তর দাতার আইডি: | | | |

এ. ব্যক্তিগত তথ্য

বাচ্চার নাম:

মায়ের নাম:

স্থায়ী ঠিকানা:

মোবাইল নাম্বার:

বি. সামাজিক ও জনতাত্ত্বিক তথ্য :

নং	প্রশ্ন	উত্তর	কোড
১	আপনার বাচ্চার বয়স কত?	..... বছর	
২	কত বছর বয়সে আপনার বাচ্চার রোগ নির্ণয় হয়েছিল?	..... বছর	
৩	আপনি কোথায় বাস করেন?	শহর-১ মফস্বল শহর-২ গ্রাম-৩	
৪	আপনার শিক্ষাগত যোগ্যতা কি?	অশিক্ষিত-১ প্রাথমিক-২ মাধ্যমিক-৩ এস. এস. সি-৪ এইচ. এস. সি -৫ স্নাতক-৬ স্নাতকোত্তর-৭ অন্যান্য-৮	
৫	আপনার কি চাচাতো/ মামাতো ভাইয়ের সঙ্গে বিয়ে হয়েছে?	হাঁ-১ না-২	

৬	আপনার পেশা কি (মায়ের)?	গৃহিণী-১ শিক্ষিকা-২ শ্রমজীবী-৩ চাকরি-৪ গার্মেন্টস ফ্যাক্টরি চাকরি-৫ কেমিক্যাল ফ্যাক্টরি চাকরি-৬ ব্যবসা - ৭ বেকার-৮ অন্যান্য-৯	
৭	বাচ্চার বাবার পেশা কি?	কৃষক-১ শিক্ষিকা-২ শ্রমজীবী-৩ চাকরি-৪ গার্মেন্টস ফ্যাক্টরি চাকরি-৫ কেমিক্যাল ফ্যাক্টরি চাকরি-৬ ব্যবসা - ৭ বেকার-৮ অন্যান্য-৯	
৮	আপনার পরিবারের মাসিক ইনকাম কত (স্বামী+স্ত্রী+ছেলে +মেয়ে)?	..... টাকা	

সি. ব্যাধির ধরন

নং	প্রশ্ন	উত্তর	কোড
৯	আপনার বাচ্চার রোগ/ব্যাধিটির নাম কি?	সেরিব্রাল পালসি -১ অটিজম -2 ডাউন সিনড্রোম-3 স্পাইনা বাইফিডা-4 হাইড্রোসেফালাস-5 মাইক্রোসেফালি -6 অন্যান্য উন্নয়ন বিলম্ব-7	

ডি. মায়ের আচরণগত ফ্যাক্টর (গর্ভাবস্থার আগে এবং গর্ভাবস্থার সময়)

নং	প্রশ্ন	উত্তর	কোড
১০	আপনি কি গর্ভবতী অবস্থায় নেশা জাতীয় দ্রব্য (ড্রাগস) ব্যবহার করতেন?	হাঁ-১ না-২	
১১	আপনি কি গর্ভাবস্থায় মদ্যপান করতেন?	হাঁ-১ না-২	
১২	আপন কি গর্ভাবস্থায় ধূমপান করতেন?	হাঁ-১ না-২	

ই. গর্ভাবস্থা এবং প্রসব সম্পর্কিত তথ্য

নং	প্রশ্ন	উত্তর	কোড
১৩	আপনার বাচ্চার সংখ্যা কত জন?		
১৪	এটা কত নম্বর গর্ভাবস্থা?		
১৫	এই বাচ্চার গর্ভাবস্থার সময় আপনার বয়স কত ছিল?	..... বছর	
১৬	গর্ভাবস্থা সময় কাল নির্দিষ্ট করে বলুন	মেয়াদের আগে (<৩৭সপ্তাহ)-১ মেয়াদের মধ্যে (৩৭সপ্তাহ সম্পূর্ণ)-২ পুণ্য মেয়াদ (৪০ সপ্তাহ) -৩ মেয়াদের পরে (>৪০ সপ্তাহ) -৪	
১৭	আপনি কি গর্ভাবস্থায় নিয়মিত চেকআপ করতেন?	হাঁ-১ না-২	
১৮	যদি হা হয় তাহলে নির্দিষ্ট করে বলুন....	নিয়মিত -১ অনিয়মিত-২	
১৯	আপনার ডেলিভারির ধরন কি ছিল?	নরমাল ডেলিভারি-১ সিজার -২	
২০	প্রসব বেদনার সময়কাল কত ছিল?	স্বল্প সময় প্রসব (<৬ঘন্টা)- ১ স্বাভাবিক (৬-১৮ঘন্টা)- ২ দীর্ঘায়িত প্রসব (>১৮ঘন্টা)- ৩	
২১	আপনার কি ধরনের গর্ভাবস্থা ছিল?	একক -১ জমজ-২ ত্রয়ী/তিনটি-৩ অধিক -৪	
২২	আপনার ডেলিভারিটি কে সম্পন্ন করেছিল?	মিডওয়াইফ-১ ডাক্তার-২ নার্স-৩	

		ধাত্রী (অভিজ্ঞ/আন অভিজ্ঞ) -৪ অন্যান্য-৫	
২৩	আপনার কি পূর্বে প্রতিবন্ধী বাচ্চা ছিল?	হাঁ-১ না-২	
২৪	আপনার পরিবারে কি প্রতিবন্ধী কোন বাচ্চা ছিল?	হাঁ-১ না-২	
২৫	বাচ্চার বাবার পরিবারে কি প্রতিবন্ধী কোন বাচ্চা ছিল?	হাঁ-১ না-২	
২৬	আপনার কি গর্ভাবস্থা নষ্ট হয়ে যেত?	হাঁ-১ না-২	
২৭	যদি হা হয় তাহলে কতবার নষ্ট হয়েছে?		

এফ. গর্ভাবস্থার সম্পর্কিত অসুস্থতা (জন্মের আগে):

নং	প্রশ্ন	উত্তর	কোড
২৮	হাইপোথাইরয়েডিজম	হাঁ-১ না-২	
২৯	আপনার কি গর্ভাবস্থা সময় উচ্চ রক্তচাপ ছিল?	হাঁ-১ না-২	
৩০	আপনার কি গর্ভাবস্থা সময় রক্তস্বল্পতা ছিল?	হাঁ-১ না-২	
৩১	আপনার কি গর্ভাবস্থায় ডায়াবেটিস ছিল?	হাঁ-১ না-২	
৩২	আপনার কি রক্তের রোগ ছিল?	হাঁ-১ না-২	
৩৩	আপনার কি ফুসফুসের রোগ ছিল?	হাঁ-১ না-২	
৩৪	আপনার কি প্রসাবে সংক্রমণ ছিল?	হাঁ-১ না-২	
৩৫	আপনার কি অ্যাজমা ছিল?	হাঁ-১ না-২	
৩৬	আপনি কি গর্ভাবস্থায় পড়ে গিয়েছিলেন?	হাঁ-১ না-২	
৩৭	আপনার কি গর্ভাবস্থায় এগুলো ছাড়া অন্যান্য অসুস্থতা ছিল?	হাঁ-১ না-২	

জি. শিশু জন্ম তথ্য (জন্মের সময়):

নং	প্রশ্ন	উত্তর	কোড
৩৮	জন্মের সময় মাথায় আঘাত পেয়েছিল?	হাঁ-১ না-২	
৩৯	জন্মের সময় শ্বাসরোধ ছিল?	হাঁ-১ না-২	
৪০	জন্মের কত সময় পরে বাচ্চাটি কান্না করেছিল?	জন্মের সঙ্গে সঙ্গে-১ ৫-১০ মিনিট পরে-২ কান্না করেনি-৩	
৪১	জন্মের সময় বাচ্চার ওজন কত কেজি ছিল?	সাধারণ (২.৫ কেজি)-১ জন্মগত ওজন কম (২২.৫ কেজি) -২ অতিরিক্ত ওজন-৩	
৪২	অন্যান্য জটিলতা ছিল?	হাঁ-১ না-২	
৪৩	যদি হা হয় তাহলে নির্দিষ্ট করে বলুন.		

এইচ. জন্মের পরে (এক মাসের মধ্যে):

নং	প্রশ্ন	উত্তর	কোড
৪৪	বাচ্চার জন্ডিস ছিল?	হাঁ-১ না-২	
৪৫	বাচ্চার নিউমোনিয়া ছিল?	হাঁ-১ না-২	
৪৬	বাচ্চার খিচুনি ছিল?	হাঁ-১ না-২	
৪৭	বাচ্চার অক্সিজেনের প্রয়োজন হয়েছিল?	হাঁ-১ না-২	
৪৮	বাচ্চা এন আই সি ইউ/ আই সি ইউ তে ভর্তি ছিল?	হাঁ-১ না-২	
৪৯	যদি হা হয় তাহলে নির্দিষ্ট করে বলুন.....		

Gantt chart

Activities/ months	Sep 14	Oct 24	Nov 24	Dec 24	Jan 25	Feb 25	Mar 25	Apr 25	May 25	June 25	July 25	Aug 25
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 Final submission												