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## CEREBRAL PALSY RISK FACTORS ASSOCIATED WITH PREGNANCY AND DELIVERY

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### ABSTRACT

**Objective:** To identify and analyze the risk factors associated with pregnancy and delivery that contribute to the development of cerebral palsy in children. **Material and Methods:** To better understand what factors lead to cerebral palsy in children, a cross-sectional study was conducted at the CRP pediatric hospital in Savar, Dhaka. The study's sample size of 56 was reached by a convenience sample of mothers of children with cerebral palsy. In-person interviews were conducted utilizing a survey instrument translated into Bengali or the native tongue and then pilot tested. Excel and SPSS were used for statistical analysis. Informed consent and confidentiality were ensured under ethical guidelines. **Results:** The data shows past socioeconomic variables. Population age distribution: 37.50% 29–35. 88.1% were Muslim. 59% rural residential areas. 35.70% SSC education. 85.7% had two or more children, 45.6% under three. 55% were males, 45% female. 41% of pregnancies had issues, and 24.9% of women underwent abortions. Normal births were 51.80% and cesarean sections 48.20%. Post-birth statistics included crying immediately (34%), yellowish eyes (50%), fever with seizures (61%), head injuries (48%), and birth hypoxia (38%). 35.70% were born at home, 30.40% in hospitals (17.90% public, 16.10% private). Figure 3 showed hypertension (20%), diabetes (16%), and anemia (23%). Age, religion, education, number of children, past abortions, delivery method, and birthplace were correlated. Diabetes, hypertension, anemia, and birthplace were unrelated. **Conclusion:** Awareness of cerebral palsy is poor despite its prevalence. In developed country physiotherapy is considered as an important treatment for cerebral palsy children. Quantitative research was used to survey pediatric patients and identify risk variables in this study. Factors shared by many were old age, illiteracy, and origins in rural areas. Risk recognition and mitigation must be prioritized.

**KEYWORDS:** Cerebral palsy, Risk factor, Pregnancy, Delivery.



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## Introduction:

Cerebral palsy (CP) is a neurological condition that affects early childhood mobility and muscle coordination [1]. Injury or abnormality of the developing brain causes this non-progressive disability. 80% of childhood impairment, including CP, occurs in low- and middle-income countries [2]. In Bangladesh, one of the world's most densely populated countries, CP is a prominent cause of childhood disability. CP prevalence in rural Bangladesh is 3.4 per 1000 live births, with 233,514 affected children [3]. A child's posture, balance, movement, and daily activities are greatly affected by CP [1]. CP's causes are unknown, however antenatal, perinatal, and postnatal variables have been linked to it. Prematurity, low birth weight, low socioeconomic position, and male gender are risk factors for CP[4]. In low-resource countries like Bangladesh, home-delivered CP newborns lack medical attention. Maternal, child, and socio-demographic factors influence CP development. Age, education, number of antenatal care visits, iron supplement use, thyroid issues, and pregnancy difficulties are maternal factors. CP risk increases with young (<20 years) and old (>35 years) maternal age [5]. CP risk is also affected by gender, birth order, birth interval, and socio-demographic characteristics such race, religion, and location (Suwal, 2017). CP is caused by birth hypoxia, and children with CP have lower physical fitness due to movement difficulties [6]. CP prevalence varies by race and gender, with Asians having a lower frequency than whites and males being more affected than females (except in America) [7]. CP's causes are unknown, however congenital infections, birth abnormalities, preterm birth, and head trauma have been linked to it. Low birth weight babies are more likely to develop CP. Long-term care and financial resources are needed for CP [8]. Task-specific training, strength training, and intense motor training in increasing gross motor function and functional capacities. A review found that task-oriented training and strengthening improve motor function and ADLs. Robotic-assisted gait training in CP youngsters. Interventions increased walking speed, endurance, and stride length [9]. A randomized controlled experiment investigated the benefits of water treatment on gross motor function in children with CP [10]. Hydrotherapy improved balance, mobility, and strength. CP treatment generally involves a multidisciplinary approach by pediatric physiotherapists. To lower the illness burden, interventions must consider antenatal and delivery risk factors for CP. This study examines the prenatal and perinatal risk factors for CP, the birth process, and maternal age. This study can improve patient care and raise awareness by improving nurses' CP understanding.

## Method

The CRP pediatric unit in Savar, Dhaka, was the location of this cross-sectional investigation. The purpose of this research was to identify potential causes of cerebral palsy in children. Mothers of children diagnosed with cerebral palsy constituted the study population. Due to the low population size, participants were chosen using a convenience sample method. For this research, 56 people served as the sample size. In-person interviews utilizing a pilot-tested survey instrument were used to compile the data. Personal details, socioeconomic status, maternal health, and child health were all included in the survey's many sections. Respondents' anonymity and confidentiality were protected by collecting data only in Bengali or the native tongue. After data was collected, it was stored and checked for quality control. Statistical Package for the Social Sciences (SPSS) version 26.0 was used for the analysis. Inclusion and exclusion criteria were used to determine the final sample. Patients with cerebral palsy who were confined to an indoor setting at CRP were eligible for inclusion [3]. Patients with additional congenital issues than cerebral palsy, patients who refused to participate, and children who did not have cerebral palsy were all disqualified [7]. The study complied with all applicable ethical guidelines and World Health Organization (WHO) standards. All participants were made aware of their right to discontinue involvement in the study at any moment, as it was entirely

voluntary on their behalf. Privacy and anonymity were both protected throughout. The results of this research will aid in determining the causes of cerebral palsy before and after birth. Nurses and other medical professionals can utilize this data to better identify and handle potential complications for expectant mothers.

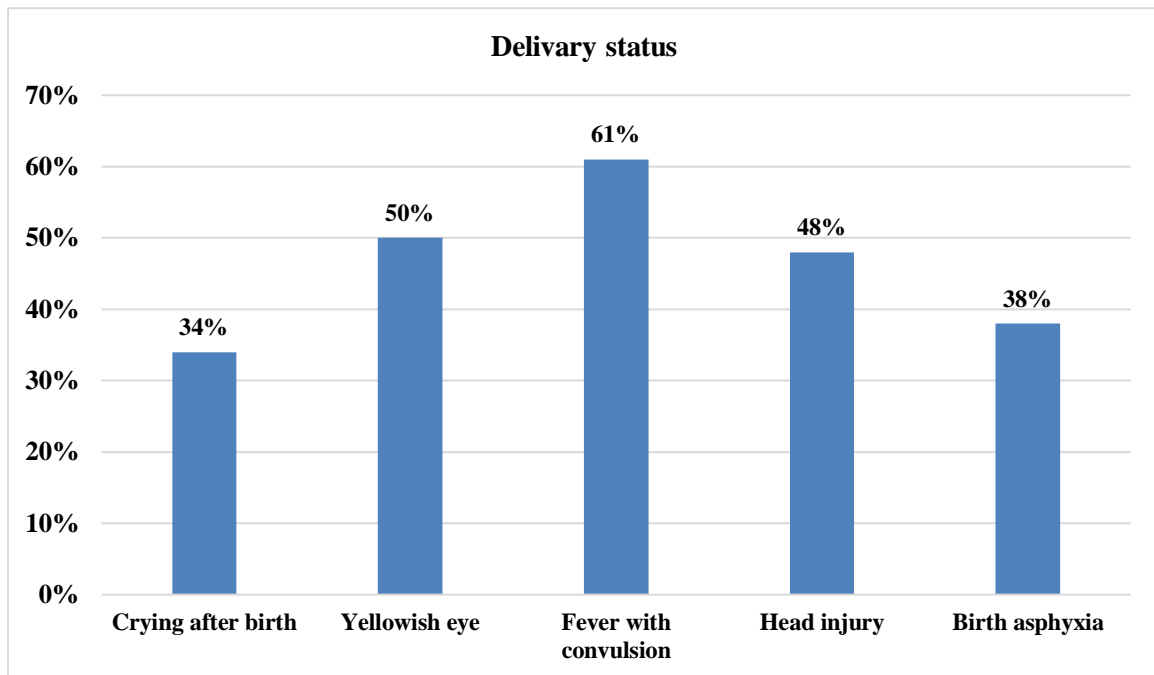
## Results

Variable	Value	Variable	Value	Variable	Value
<b>Age</b>		Primary	32.4%	0-3 years	45.6%
15-21 Years	25.0%	SSC	35.70%	More than 3 years	54.4%
22-28 Years	33.90%	HSC	10.70%	<b>Gender of children</b>	
29-35 Years	37.50%	Graduation or above	17.90%	Male	55%
36-42 Years	3.60%	<b>Family type</b>		Female	45%
<b>Religion</b>		Single	50.0%	<b>Problem during pregnancy</b>	
Muslim	88.1%	Joint	50.0%	Yes	41.0%
Others	11.9%	<b>Family person</b>		No	59.0%
<b>Area of residence</b>		Less than 3	24.8%	<b>Previous abortion</b>	
Rural	59%	3 or more	75.2%	Yes	24.9%
Semi-urban	9%	<b>Number of children</b>		No	75.1%
Urban	32%	1	14.30%	<b>Delivery method</b>	
<b>Educational qualification</b>		2 or more	85.7%	Normal	51.80%
Illiterate	3.3%	<b>Age of children</b>		Caesarian section	48.20%

**Table 1: Baseline characteristics of all participant**

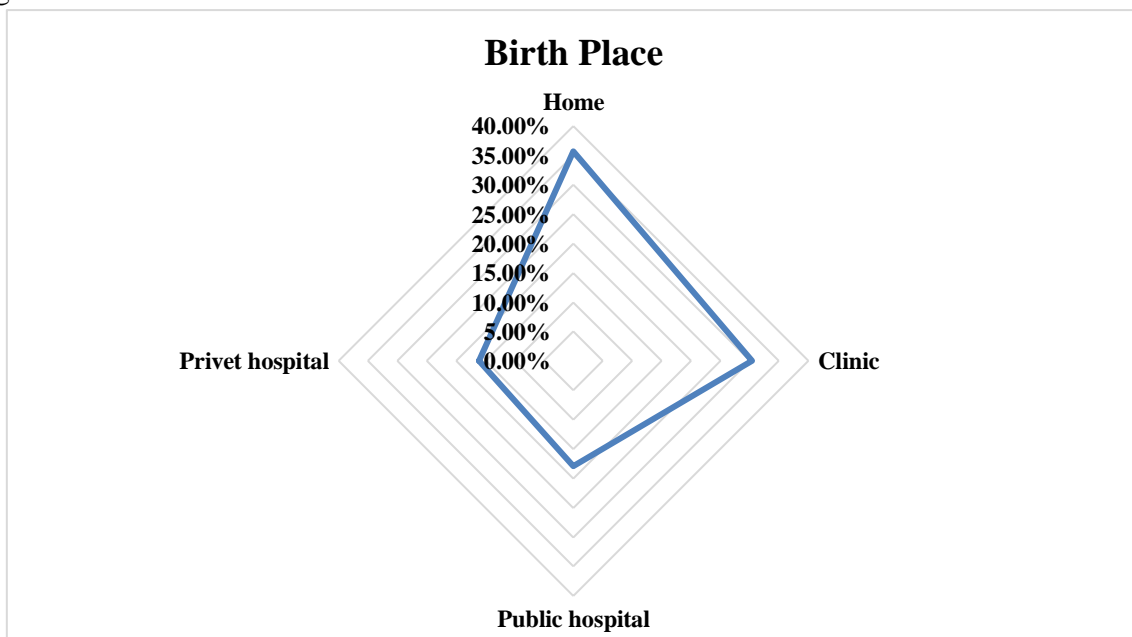
The given numbers indicated various socioeconomic variables and their corresponding values in the past. In terms of age, 25.0% of the population were between 15 and 21 years old, followed by 33.90% in the age group of 22 to 28 years, 37.50% in the age group of 29 to 35 years, and 3.60% in the age group of 36 to 42 years. The majority of people (88.1%) followed the Muslim religion, while the remaining 11.9% belonged to other religions. In terms of residential areas, 59% lived in rural places, 9% in semi-urban areas, and 32% in urban areas. When it came to education, 3.3% were illiterate, 32.4% had completed primary school, 35.70% had finished SSC, 10.70% had finished HSC, and 17.90% had a bachelor's degree or higher. Single (50%) and joint (50%) families were equally represented. The majority of families (75.2%) had three or more members, while 24.8% had less than three. In terms of children, 14.30% had one child, and 85.7% had two or more. Among the children, 45.6% were between 0 and 3 years old, while 54.4% were older than 3 years. In terms of gender, 55% of the children were boys, and 45% were girls. A significant portion of pregnancies (41%)

experienced problems, while the remaining (59%) did not. Similarly, 24.9% of women had previous abortions, while 75.1% did not. Normal (51.80%) and cesarean section (48.20%) were the two types of birth methods utilized.



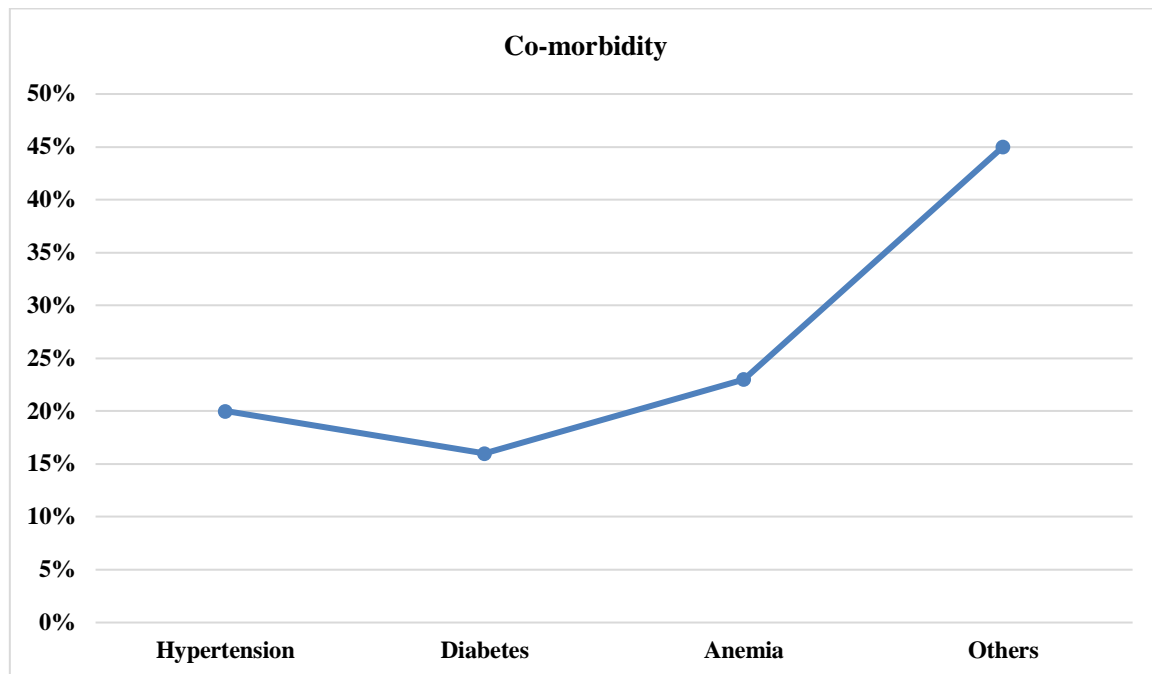
**Figure 1 : delivary status among the perticipant**

The information provided indicated the frequency of various post-birth situations in the past. Approximately 34% of newborns cried immediately after birth, and 50% exhibited yellowish-colored eyes. Fever with seizures affected 61% of infants, while head injuries were recorded in 48% of cases. Birth asphyxia, a condition resulting from insufficient oxygen during delivery, occurred in 38% of births according to Figure 1. The data also highlighted the distribution of birthplaces. In the past, 35.70% of recorded births took place at home, while 30.40% occurred in hospitals. Approximately 17.90% of births were in public hospitals, and 16.10% occurred in private hospitals, as shown in Figure 2.



**Figure 2: Birthplace among the participants**

The figures in Figure 3 depicted the occurrence of multiple illnesses simultaneously in the past. In 20% of cases, individuals had hypertension, while 16% of the population had diabetes. Anemia was present in 23% of the population, while the remaining 45% had other co-morbidities that were not specified in the given data.



**Table 2: Association between Birthplace and age, religion, educational status, number of children, diabetes mellitus, hypertension, anemia, previous adsorption, delivery status, birth palce**

Variable	P value
Age	0.046*
Religion	0.001**
Educational status	0.001**
Number of children	0.029*
Diabetes mellitus	0.063
Hypertension	0.395
Anemia	0.059*
Previous absorption	0.135
Delivery method	0.015*

Birth Place	0.491
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In this research study, the table 2 illustrates the relationship between birthplace and age, religion, education, number of children, diabetes mellitus, hypertension, anemia, prior absorption, delivery status, and birthplace. These relationships' p-values indicate statistical significance. Birthplace is correlated with age, religion, education, number of children, previous absorption, delivery technique, and birthplace. Diabetes, hypertension, anemia, and birthplace are not associated.

## Discussion

This study investigated the health and social background of a certain study group. The number of cerebral palsy patients in the country is unknown due to a lack of extensive survey data. 56 mostly mother individuals were studied. A study found that advanced maternal age, both below 20 and above 35 years, increased the risk of cerebral palsy and prenatal and perinatal disorders [11]. Poorer nations have greater rates of cerebral palsy [12]. 59% of participants resided in rural, 32% in cities, and 9% in suburbs. 35.70% of moms had primary or S.S.C. education, 10.70% H.S.C., and 17.90% honors. Asians had lower incidences of cerebral palsy than whites, and males were more afflicted than females [13]. This survey had 55% boys and 45% girls. In this study, 59% of moms had no pregnancy-related issues, despite prior Danish studies linking the prenatal period to cerebral palsy. 41% of mothers had specific difficulties. Previous research linked home birth and prenatal neglect to cerebral palsy [14]. 35.70% of deliveries were at home, 30.40% at clinics, 17.90% at public hospitals, and 16.10% at private hospitals. Cesarean birth increased the chance of cerebral palsy compared to vaginal delivery [15]. A study found no association between birth-related variables and cerebral palsy in Bangladesh [16]. Most participants had a nine-month delivery time, and 45% delivered 3kg babies. In a study cerebral palsy delivery risk variables in Dhaka, Bangladesh [17]. In this study, 45% of moms had no delivery complications and 55% had particular issues. Due to its small sample size and inadequate data representation, this study cannot be extrapolated to all Bangladeshi cerebral palsy patients. Permission refusals and individuals needing counseling to reveal personal information slowed data collecting. Insufficient finances and time also hampered the investigation.

## Conclusion:

Cerebral palsy, a disorder of significant prevalence, continues to be insufficiently comprehended. Physiotherapy is regarded as an essential therapeutic intervention for children in developed nations. The present study utilised a quantitative research approach to investigate paediatric patients, with the aim of identifying prevalent risk variables. The key findings of the study revealed significant connections with advanced age, inadequate educational attainment, and rural backgrounds. In order to promote greater consciousness and successfully tackle this matter, it is imperative to prioritise the implementation of initiatives aimed at identifying and mitigating risks.

### **Author Contributions:**

#### **Shahid Afridi**

GROUP 1: Conception of the work, Acquisition and Analysis of data

GROUP 2: Revising the work critically for important intellectual content

GROUP 3: Final approval of the version to be published

GROUP 4: Agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

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**Conflicts of Interest: No conflict of interest**

**Institutional Review Board Statement: (Ref no: CRP/BHPI/IRB/02/2023/328).**

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