



UNIVERSITI PUTRA MALAYSIA

***PREVALENCE AND FACTORS ASSOCIATED WITH STRESS AMONG
MOTHERS OF CHILDREN WITH CEREBRAL PALSY IN AN NGO IN
SATKHIRA, BANGLADESH***

SANKAR CHANDRA DEBNATH

FPSK(m) 2021 9



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By

SANKAR CHANDRA DEBNATH

**Thesis Submitted to the School of Graduate Studies, Universiti Putra
Malaysia, in Fulfilment of the Requirements for the Degree of
Master of Science**

February 2021

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DEDICATION

This work is dedicated to mothers of children with disabilities.



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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

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February 2021

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Cerebral palsy is a chronic neurological disorder for children. The incidence of cerebral palsy is high in developing countries. Women who are primary caregivers of children with cerebral palsy have more responsibility for a long time caring. Mothers of children with cerebral palsy can develop stress while caring for their children. This study aims to determine the prevalence of maternal stress and its associated factors among mothers of children with cerebral palsy in an NGO in Satkhira, Bangladesh. A cross-sectional study was done using a simple random sampling method and guided questionnaires. A pre-test was performed to check the reliability and validity of each instrument. Statistical Package for Social Sciences (SPSS) version 25 was used for data analysis. A Chi-square test was done to determine the association between independent and dependent variables. Multiple Logistic Regression analysis was performed to determine the factors that predict maternal stress. The significance level was set as a p-value of less than 0.05. The prevalence of maternal stress was 59.3% among mothers of children with cerebral palsy. Sociodemographic characteristics of mothers, the majority respondents were aged between 18-28 years (41%), with primary education (48.8%), married mothers (84.3%), housewife (74.4%), mothers living in an extended family (59.3%), and average family income (44.8%). The sociodemographic characteristics of children were the younger age group (60.5%), with male children (62.2%). The majority of respondents had good knowledge (57.8%), lower negative family impact (58.1%), and higher formal social support (54.4%). There was a significant association between maternal stress and age of mothers ($p < 0.001$), education of mothers ($p < 0.001$), types of the family ($p = 0.05$), family income ($p < 0.001$), child's age ($p < 0.001$), child's gender ($p = 0.05$), and number of children ($p < 0.001$). Regarding maternal appraisal and social support, there was a significant association between maternal stress and negative family impact ($p < 0.001$) and

informal social support ($p < 0.001$). The fitted final model of regression reported the independent predictors of maternal stress followed by mothers' aged 29-38 (AOR=3.844, 95%CI=1.831-8.069), divorced/separated (AOR=56.196, 95%CI=8.764-360.340), core family (AOR=2.879, 95%CI=1.538-5.388), child's age 1-7 (AOR=2.294, 95%CI= 0.992-5.300), male children (AOR=2.108,95%CI=1.142-3.88), higher negative family impact (AOR=3.206, 95%CI=1.171-8.772), lower informal social support (AOR=2.340, 95CI%=1.309-4.185) respectively. This study found that mothers of children with cerebral palsy perceived higher stress levels with child age, male child, negative family impact, and informal social support. The factors identified in this study could help to develop policies and strategies to minimize maternal stress among mothers of children with cerebral palsy in Bangladesh.

Keywords: Prevalence, maternal stress, cerebral palsy, children, social support, maternal appraisal.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia
sebagai memenuhi keperluan untuk ijazah Master Sains

**KADAR KELAZIMAN DAN FAKTOR-FAKTOR BERKAITAN DENGAN
STRES DALAM KALANGAN IBU-IBU KANAK-KANAK CEREBRAL PALSY
DI SEBUAH NGO DI SATKHIRA, BANGLADESH**

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Cerebral palsy (CP) merupakan sejenis penyakit gangguan neurologi yang kronik untuk kanak-kanak. Kadar kelaziman CP adalah tinggi dalam kalangan negara-negara membangun. Golongan wanita yang menjadi pengasuh utama kanak-kanak CP mempunyai tanggungjawab yang lebih besar untuk menjaga anak-anak mereka sepenuh masa. Para ibu yang mempunyai CP pula boleh mengalami tekanan semasa menjaga anak-anak mereka. Untuk menentukan kadar kelaziman tekanan dan faktor-faktor yang berkaitan dengannya dalam kalangan ibu-ibu kanak-kanak *cerebral palsy* di sebuah NGO di Satkhira, Bangladesh. Kajian keratan rentas telah dijalankan menggunakan persampelan rawak mudah dan soal-selidik. Suatu pra-ujian telah dijalankan terlebih dahulu untuk memeriksa kebolehpercayaan dan kesahihan setiap intrumen kajian. Pakej Statistik untuk Sains Sosial (SPSS) versi 25 telah digunakan untuk menganalisis data. Ujian Chi-square digunakan untuk mengenalpasti hubungkait antara pembolehubah bebas dan pembolehubah bersandar. Analisis regresi logistik berganda dilaksanakan untuk mengenalpasti faktor-faktor yang meramalkan tekanan ibu. Tahap keertian ditetapkan sebagai nilai p kurang dari 0.05. Kadar kelaziman tekanan adalah 59.3% dalam kalangan ibu-ibu kanak-kanak CP. Ciri-ciri sosio-demografi para ibu adalah seperti berikut: berumur dalam lingkungan 18 hingga 28 tahun (41.0%), mempunyai pendidikan sekolah rendah (48.8%), sudah berkahwin (84.3%), bekerja sebagai suri rumah (74.4%), tinggal bersama keluarga luas (59.3%), dan memiliki kadar pendapatan keluarga yang sederhana (44.8%). Kebanyakan responden kanak-kanak pula terdiri daripada kumpulan usia yang lebih muda (60.5%) dan berjantina lelaki (62.2%). Majoriti responden ini mempunyai pengetahuan yang baik (57.8%), kesan keluarga negatif yang lebih rendah (58.1%), dan sokongan sosial formal yang lebih tinggi (54.4%). Terdapat hubungan yang signifikan di antara tekanan ibu dengan usia ibu ($p < 0.001$), pendidikan ibu ($p < 0.001$), jenis keluarga

($p=0.05$), pendapatan keluarga ($p<0.001$), usia anak ($p <0.001$), jantina anak ($p = 0.05$), dan bilangan anak ($p<0.001$). Bagi penilaian ibu dan sokongan sosial pula, terdapat hubungan yang signifikan antara tekanan ibu dengan kesan keluarga negatif ($p<0.001$) dan sokongan sosial tidak formal ($p<0.001$). Model regresi fit melaporkan beberapa peramal bebas sebagai faktor-faktor tekanan ibu seperti yang berikut: ibu berusia 29-38 (AOR = 3.844, 95% CI = 1.831-8.069), bercerai atau berpisah (AOR = 56.196, 95% CI = 8.764-360.340), keluarga teras (AOR = 2.879, 95% CI = 1.538-5.388), anak berusia 1-7 (AOR = 2.294, 95% CI = 0.992-5.300), kanak-kanak lelaki (AOR = 2.108, 95% CI = 1.142-3.88), kesan keluarga negatif yang lebih tinggi (AOR = 3.206, 95% CI = 1.171-8.772), sokongan sosial tidak formal yang lebih rendah (AOR = 2.340, 95% CI = 1.309-4.185). Kajian ini mendapati bahawa ibu-ibu kanak-kanak CP mengalami tahap tekanan yang lebih tinggi apabila berdepan dengan faktor seperti usia anak, anak lelaki, kesan keluarga negatif dan sokongan sosial yang tidak formal. Pengenalpastian faktor-faktor ini dapat membantu dalam pelaksanaan program-program intervensi awal bagi mengurangkan kesan-kesan buruk di samping mempromosikan kesejahteraan psikologi ibu.

Kata kunci: Kadar kelaziman, tekanan ibu, kanak-kanak cerebral palsy, sokongan sosial penilaian ibu.

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LIST OF ABBREVIATIONS

AOR	Adjusted odds ratio
BDT	Bangladeshi Taka
CP	Cerebral palsy
COR	Crude Odd Ratio
JKEUPM	Jawatankuasa Universiti untuk Penyelidikan Melibatkan Manusia
MS	Maternal stress
OR	Odd Ratio
R	Rupee
SPSS	Statistical Package for Social Science
SRS	Simple random sampling
WHO	World Health Organization
χ^2	Chi-squared value

CHAPTER 1

INTRODUCTION

1.1 Background

Cerebral palsy (CP) is a common problem in Bangladesh and other countries in the world. CP is a neurological condition that permanently affects body movement and motor coordination (Rethlefsen, Ryan, & Kay, 2010; Bartels, Korbo, & Harrison, 2020). Its etiology is related to events that happened before, during, or after birth, especially in the first two years of the life of children. The clinical image of children with CP is complex and may involve movement restriction, mobility or vision disability, and hearing loss that interferes with their neuro-psychomotor growth (Rosset, Santos, & Galera, 2011; Jiang, Liu, He, Yang, Liu, Huang, Lyu, & Li, 2020).

Four various types of CP have been reported in scientific literature, and they include spastic, athetoid, ataxic, and mixed (Bangash, Hanafi, Idrees, & Zehra, 2014). A Swedish study reported that the subtypes of CP were found in different proportions such as spastic hemiplegic (33%), diplegic (44%), tetraplegic (6%), dyskinetic (12%), and pure ataxia (4%) (Ashwal, Russman, Blasco, Miller, & Sandler, 2004). The spastic type is regarded as the most prevalent type of CP and 50% of cases result in total disability (Robertson, Ricci, Grady, Oskoui, Goez, Yager, & Andersen, 2017). According to the report by the UN International Children's Fund (UNICEF, 2020), an estimated 93 million children are living with disabilities around the world. Epidemiological data across the world showed that there were 1.5 to 4 cases of CP per 1,000 live births (Arneson, Durkin, Benedict, Kirby, Yeargin-Allsopp, Naarden-Braun, & Doernberg, 2009; Bhasin, Brocksen, Avchen, & Van Naarden Braun, 2006).

Children with CP face a variety of issues throughout their growth as a result of the activity limitations they face. Physical therapy and intervention program are essential in ensuring that this development is as effective as possible (Gordon, Hung, Brandao, Ferre, Kuo, Friel, Petra, Chinnan, & Charles, 2011). Gross motor dysfunction is the most critical limiting factor in physical activity involvement for children with cerebral palsy (Carlson, Taylor, & Dodd, 2017; Keawutan, Bell, & Davies, 2014). It is crucial to identify feasible and beneficial gross motor interventions that encourage physical activity for children with CP in order to address low levels of physical activity and involvement in this population (Zwier, van Schie, Becher, Smits, Gorter, & Dallmeijer, 2010). The American College of Sports Medicine describes exercise as "planned, organized, and repetitive physical activity aimed at improving or maintaining physical fitness." Cardiorespiratory fitness, physical strength and endurance, body structure and flexibility, balance, agility, reaction speed, and power are all included in this sense (Garber, Blissmer, & Deschenes et al., 2011). Some researchers reported

that different types of the intervention program and physical therapy (constraint-induced movement therapy, bimanual therapy, intensive functional training, gross motor functional activities, and home-based training program) improve the functioning of children with CP (Beyenheuft, Ebner-Karestinos, Surana, Paradis, & Sidiropoulos, 2017; Sorsdahl, Moe-Nilssen, Kaale, Rieber, & Strand, 2010; Yong, Sung Kim, & Min, 2017).

Stress is one of the fundamental factors which are influenced by the occurrence of CP in children. At the most fundamental level, stress is the reaction of our body to the demands from a condition or occurrence in existence. Such reactions may differ between individuals, which could be attributed to physical, social and financial conditions (Hartly, Seltzer, Head, & Abbeduto, 2012). According to the Centre for Studies and Human Stress (2018), stress comprises typical activities that may elicit an individual uncomfortable, witness something different or unpredictable, and events that undermine one's self-confidence.

Aside from the direct factors linked to children, maternal stress has also been demonstrated as an important aspect of CP. Maternal stress refers to abnormal intellectual, behavioral, and various psychosomatic problems that arise in adjusting and managing motherhood demands (Charil, Laplante, Vaillancourt, & King, 2010). Sepa, Frodi, and Ludvisson (2004) described maternal stress as a status of mental health in which the different aspects of parenthood provide a perceived inequality between contextual expectations and personal resources.

Parenthood typically poses people with one of the most mentally demanding activities, encompassing feelings and burdens that may drive parents to both joys and anxieties (Walton, 2012). Caregiving is one of the principal responsibilities in parenting young children, and this role may change considerably when a child is affected by functional motor problems (Olawale, Deih, & Yaadar, 2013). The main challenge for mothers is to manage their children with cerebral palsy while maintaining the requirements of everyday activities such as nurturing, bathing, and toileting (Krstic & Oros, 2012; Ong et al., 1998; Raina et al., 2005). Mothers experienced adverse reactions to the nurturing of children with CP (Jeong, Jeong, & Bang, 2013). A study by Al-Gamal and Long (2013) and Guyard, Fauconnire, Meremet, and Cans (2011) revealed that mothers of children with cerebral palsy are more likely to experience severe depression, distress, poor health, and stress.

Besides, adverse mental health problems such as depression may also be triggered by parental severity or an unattended burden on parenting stress. Depression is of significant concern, as studies have indicated that depression is a widespread psychiatric illness impacting over 350 million people worldwide. Primary statistics have revealed the incidence of such disease to be greater in women than in males (World Health Organization, 2012). Mothers spend most of the time caregiving of children and caring for CP children hampers to take

time for themselves. For instance, a study carried out by Castro and Piccinini (2001) explained that depending on the severity of CP, the ongoing care for food, clothing, consulting, and rehabilitation for a more extended period decreases the mothers' time for themselves. Mothers of children with cerebral palsy feel more psychical burdened, which may cause the appearance of maternal stress. Mothers of children with CP have more responsibility to nurture their children, and they were more affected by the problems related to CP in their children (lack of sleeping, bed wetting, soiling, and feedings) compared to fathers (Ahmadzadeh & Mokhlesin, 2014). In addition, mothers of children with CP had poor physical and mental health (Vijesh & Sukumaran, 2007; Byrne, Hurley, Daly, & Cunningham, 2010; Ribeiro, Sousa, Vandenberghe, & Porto, 2014). Few studies compared the level of maternal stress between those having children with or without CP (Wang & Jong, 2004; Farajzadeh, Amini, Maroufizadeh & Wijesinghe, 2018). The level of maternal stress was higher in mothers of children with CP than those having healthy children (Parekes, Caravales, Marcelli, Franco, & Colver, 2011; Katkic, Morovic, and Kovacic, 2017; Yamaoka, Tamiya, Izumida, Kawamura, Noguchi, 2016). Accordingly, the diagnosis of CP affects the family routine as it requires some behavioral changes to meet the child's needs compared to healthy children. Children with CP require special caring and rehabilitation services compared to healthy children, and it is a financial burden to the family (Hwang, 2002; Grootenhuis & Bronner, 2009; Brehaut et al., 2009; Grootenhuis & Bronner, 2009).

The prevalence of CP in children varies between developing and developed countries (Pandithage & Vithanage, 2016; Parkes et al., 2011). CP is more prevalent in low-or middle-income countries compared to industrialized and developed countries (Forthun, Strandberg-Larsen, Wilcox, 2018). The prevalence of CP in developed countries such as Australia, Canada, and the United States ranged from 1.8 to 2.3 cases per 1000 children (Sellier, Platt, Andersen, Krageloh-Mann, & De La Cruz, 2015; Kakooza-Mwesige, Andrews, Peterson, Wabwire Mangen, Eliasson, & Forssberg, 2017; Charlene et al., 2017; Amankwah, Oskoui, Garner, Bancej, Manuel, Wall, Finès, Bernier, & Reimer, 2020). However, the prevalence was higher in India and Egypt (3.6/1000 children) (Abd-elwarth, 2014; Rajagopala et al., 2013; El-Tallaway, Farghaly, Shehata, Rageh, et al., 2014), while the incidence rate in Sri Lanka was between 12 to 15 children per 1000 births (Aloysius, 2012). Eighty-five percent of children with disabilities (CWD) live in developing countries, and less than 5% receive rehabilitation services (Maloni et al., 2010).

To reduce maternal stress and other problems related to CP in children, there is a need to identify the associated factors among mothers (Freitas, Rocha, & Haasc, 2014). Sociodemographic factors such as maternal age, education, marital status, and types of family, occupation of the mother were found to influence maternal stress (Kumari and Singh, 2013). Factors associated with maternal stress among mothers of children with CP included child factors (age of child, gender, siblings, and treatment expenditure) (Panditha & Wickramasinghe, 2016), social support (formal and informal) and maternal

appraisal (positive and negative appraisal) (Peer & Hillman, 2012; Thompson, Hiebert-Murphy, & Trute, 2013; En & Juhari, 2017). Other factors reported in the literature included marital status, education level, types of family, and family income (Riberio et al., 2014; McIntyre & Brown, 2018). Therefore, approaches are needed mainly to educate the mothers on stress management, improve social support and family support, and problem-solving skills.

Bangladesh is a heavily populated country in South Asia, with an estimated 2.6 million children living with severe disabilities and cerebral palsy (Ackerman, Thormann, & Huq, 2005). Epidemiological data reported that there were 3.7 cases of CP per 1000 children in Bangladesh (Murthy, Mactaggart, Mohammad, Islam, Noe, Khan, Foster, & Bangladesh KIM Study Group, 2014), which is six times higher rate than Australia and Europe (Khandaker, Smither, Islam, Badawai, Power & Novak, 2015). Mothers are mainly responsible for the caring of the affected child; however, studies are lacking in Bangladesh in this regard. Therefore, this study aims to identify the prevalence of maternal stress and the predictors among mothers of children with CP in Satkhira, Bangladesh.

1.2 Problem Statement

Cerebral palsy is the most common cause of physical disability of children worldwide. CP is a neurological disorder characterized by brain damage (Marian, Magesa, & Fillipine, 2020). Cerebral palsy is associated with disability, which often has adverse effects on the development of a child as well as the family members (Gardiner & Iarocci, 2012; Terra et al., 2011). Children with CP need more care, and their mothers suffer more stress in caring for them (Karande & Kulkarni, 2009). Women have more responsibility in most societies, raising children, and the primary caregivers of children with disabilities are often mothers (Ones et al., 2005). Therefore, parents of children with CP are at higher risk of stress compared to other parents of naturally growing children (Krstic & Oros, 2012; Olawale et al., 2013; Parkes et al., 2011; Wang & Jong, 2004; Wijesinghe, Cunningham, Fonseka, Hewage, & Ostbye, 2014). Moreover, caring and responsibility for a CP child with specific needs may be harmful to the parents' physical well-being, psychological well-being, family relationships, social background, and financial support (Ahmadizadeh, Ehsani, Samaei, & Mirmohamadkhani, 2019; Bawalsah, 2016).

Besides, parental distress has a considerable effect on care practices, resulting in parental patterns of violent and disrespectful acts, further aggravating children's behavioral problems (Nobakht et al., 2020). Mothers of children with CP perceive their health as unsatisfactory, including symptoms of depression, stress, musculoskeletal pain, malnutrition, low concentration on family (Freitas, Rocha, & Haasc, 2014; Whittingham, Wee, Sanders, Boyd, 2013). Taking care of a physically disabled child is a full-time task with tremendous responsibilities and it places great stress on the caregiver. Unfortunately, this arises without proper planning, and the caregiver unexpectedly finds himself in this challenging

position. Furthermore, the influence of this varies from the economic cost and time expended to the caregiver's physical, psychological, and social facts. If this problem is not well handled, both the children and their parents have negative results on life quality (Mohammed, Ali, & Mustafa, 2016; Cheshire, Barlow, & Powell, 2010). Therefore, it will be a matter of concern for mothers who are the primary caregivers of children to consider the burden of parenting and the risk of consequent adverse effects (Ribeiro et al., 2014; Barreto, Bento, Barreto, Jagersbacher, Jones, Lucena, & Bandeira, 2020).

One of the earliest data on maternal stress in Bangladesh was by Mubarak et al. (2000), in which a prevalence rate of 41.8% was reported among 91 mothers of children with the condition. Pandithage and Vithanage (2016) stated that the prevalence of maternal stress was higher (44%) in Sri Lanka compared to developed countries. The prevalence of maternal stress in developed countries such as Sweden and the UK was 26% (Parkes et al., 2011; Gleen, Cunningham, Poole, Reeves, & Weindling, 2008). However, the prevalence of maternal stress was 43.43% in India among mothers of children with CP (Moideen & Mathai, 2018). There were no present data to be found regarding maternal stress among mothers of children with CP in Bangladesh.

Nevertheless, recent data have continued to show that CP remains an important health issue among children in Bangladesh. Epidemiological data reported that there were 3.4 cases of cerebral palsy per 1000 children in Bangladesh. The majority of them were males (61.8%), and spastic CP was predominant (76.9%) (Khandaker et al., 2018). Another study highlighted that the prevalence of CP in Bangladesh was 3.7 per 1000 children between 1998 and 2018, and the result indicated a considerable increase compared to previous data (Gulam et al., 2018; Murthy et al., 2014). Bornstein & Hendricks (2013) reported that CP accounted for about 22% of cases of disabilities among children. Despite the high risk of CP in Bangladesh, the majority of disabilities in children are treated at home (Shahrier, Islam, & Debroy, 2016). The reasons for such practice include financial incapacity to cater to the child's needs, poor guidance and support, and the act of evading public embarrassment (UN International Children's Emergency Fund, 2014).

Maternal stress among mothers of children with CP is influenced by several factors. Among these, the need to improve social support and positive maternal appraisal were singled out as critical aspects to reduce maternal stress in mothers of children with CP (Hasting, Kovshoff, Erown, Ward, Degli, & Remington, 2005; Jeong et al., 2013; Thompson et al., 2012). Child-related factors such as the age of the child, gender of child, mother occupation, and types of family were associated with stress among mothers of children with CP (Hasting, Kovshoff, Erown, Ward, Degli, & Remington, 2005; Thompson et al., 2012; Jeong et al., 2013). Other associated factors include lack of housing, low-income sources, mother's education and social support (Ketelaar, Volman,

Gorter, & Vermeer, 2008; Sepa, Frod, & Ludvigsson, 2004; Olawale, Deih, & Yaadar, 2013).

However, in addition to only a few existing studies on the subject area, there is data paucity on the factors influencing maternal stress in relation to CP child. Mubarak et al. (2000) did a demographic profile and investigated the predictors of maternal stress among mothers of children with CP in urban areas of Bangladesh. Factors identified to be associated with maternal stress were higher child's age, land ownership, child behavior problems, and family types. Nevertheless, important aspects such as informal social support, knowledge on CP, family income, and a positive appraisal from family were not investigated. Sharier et al. (2016) used a double ABCX model to assess the level of maternal stress among mothers of disabled children (affected with autism, ADHD, down syndrome, development delay, and CP) in Bangladesh and found that associated factors were types of disability and informal support. Although the findings are essential, considering other factors such as family support, marital status, knowledge and formal social support would provide a broader knowledge of the relationships and how to reduce maternal stress.

A recent study was conducted in the urban area of Bangladesh among mothers of children with CP to find out the depression, stress, and anxiety. This study discussed that sociodemographic characteristics of mothers and degree of severity using the GMFCS scale influenced the level of stress. Findings indicated that the research did not conclude the family support and social support. The survey explained that there was a need to study informal and formal support, knowledge, and family support to find out predictors of maternal parenting stress among mothers of children with CP (Power et al., 2019). Maternal stress among mothers of children with CP has been conducted in various part of Bangladesh and other parts of the world. These involve several locations, including Dhaka, Bangladesh (Mubarak et al., 2000); a study was conducted in the Northwest of Bangladesh (Maloni et al., 2010), another study was conducted in NorthCentral Bangladesh (Zurmonnd et al., 2015). Maternal stress studies among caregivers of children with CP conducted in other parts of the world where maternal stress is high, done by Christopher et al. (2020) in India. Some studies conducted in Sri Lanka, Malaysia, Europe and Turkey by Pandithage et al. (2016), En & Juhari (2017), Parkes et al. (2011), Yilmaz (2019) showed that the prevalence of maternal stress was high among mothers of children with CP.

Overall, there has not been a study and data to determine the factors associated with maternal stress among mothers of children with CP in Satkhira, Bangladesh; hence, this study is planned to be conducted in Satkhira, Bangladesh. The knowledge gap identified in the aforementioned studies highlights the need for a detailed investigation of the factors associated with maternal stress among mothers of children with CP in Bangladesh. Moreover, Satkhira is a highly populated and important area in Bangladesh. Most of the people depend on pisciculture and cultivating. Some government and non-

government organizations are working for the health sectors to provide health services at the community and education levels. Besides, non-government organizations support families caring for children with disabilities (Bangladesh National Information Portal, 2021). This study attempts to address this gap by studying the following variables: sociodemographic characteristics, child and maternal characteristics (expenditure of treatment, number of children, and knowledge on CP), and other factors such as maternal appraisal (positive and negative appraisal) and social support (formal and informal support) and their association with maternal stress among mothers of children with CP. The findings from this study will provide data on the current prevalence of maternal stress and associated risk factors among mothers of children with CP in Satkhira, Bangladesh.

1.3 Significance of the Study

The significance of this study cut across five major areas as mentioned below:

- The study findings will provide data on the current prevalence of stress among mothers of children with CP in Satkhira, Bangladesh, as well as identify various sources of stress experienced by mothers with CP children in the Bangladeshi context.
- For mothers, findings from this study will help the mothers of children with CP to identify their level of stress and a baseline to acquire knowledge regarding children with CP.
- Regarding the community and organization, this study's findings will help the various organizations and communities to understand and effectively handle the assistive roles for mothers of children with CP.
- For the country, this study is expected to help the government develop policies on how to reduce or control maternal stress in relation to CP children. This study will influence Bangladesh Protibondhi (disabled) Foundation (BPF) to support mothers of children with CP.
- These study findings will also inform other researchers and add further understanding to research on stress among mothers of children with CP.

1.4 Research Questions

The research questions of this study are:

- I. What is the prevalence of maternal stress among mothers of children with CP?
- II. What are the predictors for maternal stress among mothers of children with CP?

1.5 Research Objectives

1.5.1 General Objective

The general objectives of this study are:

- To determine the prevalence of maternal stress and its associated factors among mothers of children with CP in an NGO in Satkhira, Bangladesh.

1.5.2 Specific Objectives

The specific objectives of this study are:

1. To identify the prevalence of maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.
2. To describe the sociodemographic factors of mothers (age of mothers, education of mothers, occupation of mother, marital status of mother, types of family and family income), child factors (age of child, gender of child, expenditure of treatment and number of children), maternal factors [knowledge on CP (definition, aetiology, clinical signs and management), maternal appraisal (positive and negative family impact)] and social support factors (formal and informal social support) with maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh
3. To determine the association of sociodemographic factors of mothers (age of mothers, education of mothers, occupation of mother, marital status of mothers, types of family and family income) with maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.

4. To determine the association of child factors (age of child, gender of child, expenditure of treatment, and number of the children) with maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.
5. To determine the association of maternal factors [knowledge on CP (definition, aetiology, clinical signs and management), maternal appraisal (positive and negative family impact)] with maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.
6. To determine the association of social support factors (formal support and informal support) with maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.
7. To determine the predictors of maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.

1.6 Research Hypothesis

Alternative Hypothesis

The hypothesis of this study include:

1. There is a significant association between sociodemographic factors of mothers and maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.
2. There is a significant association between child factors and maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.
3. There is a significant association between maternal factors and maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.
4. There is a significant association between social support factors and maternal stress among mothers of children with CP in an NGO in Satkhira, Bangladesh.

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LIST OF PUBLICATIONS

Hayati, K.S., **Debnath, S.C.**, Norliza, A., & Islam, N. (2021). Determinants of the Psychological States of Parents of Children with Cerebral Palsy: A Cross-sectional Study in Bangladesh. *Malaysian Journal of Medicine and Health Sciences* (Accepted in press).

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