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Characteristics of Dysphagia among the Children with Cerebral Palsy in Dhaka City

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DECLARATION

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CONTENTS

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Abbreviations

CP	Cerebral Palsy
EDACS	Eating and Drinking Ability Classification System
GMFCS	Gross Motor Function Classification System
HSC	Higher Secondary Certificate
IRB	Institutional Review Board
QoL	Quality of Life
SPSS	Statistical Package for the Social Sciences
SSC	Secondary School Certificate

Abstract

Introduction: Cerebral palsy (CP) is a leading cause of childhood disability and is frequently associated with dysphagia, which can result in malnutrition, aspiration, and reduced quality of life. In Bangladesh, limited awareness and resources make feeding challenges particularly difficult to manage. This study aimed to characterize dysphagia and related functional outcomes among children with CP in Dhaka. **Objectives:** To describe the sociodemographic profile of children with CP, assess gross motor function (GMFCS), eating and drinking ability (EDACS), and examine gender associations with these outcomes. **Methods:** A cross-sectional study was conducted among 50 children with CP, aged 2–12 years, at Firoza Bari Disabled Children's Hospital, Dhaka. Sociodemographic and health data were collected from caregivers, and standardized tools (GMFCS, EDACS) were used for assessment. Data were analyzed using SPSS v25, with descriptive statistics and Chi-square tests. **Results:** Spastic CP was the most common type (72%). Feeding difficulties were reported in 12% of children, while 36% required tube feeding or supplemental nutrition. Over half of caregivers (52%) expressed dissatisfaction with dysphagia management. found that 78% of participants experienced feeding problems, with solid foods being the most challenging. The study also highlighted a significant gender difference in Gross Motor Function Classification System (GMFCS) levels, with girls having more severe impairments. **Conclusion:** Children with CP in Dhaka face significant feeding and motor challenges, with high rates of aspiration and dissatisfaction in dysphagia management. Gender was not a significant factor, underscoring the importance of individualized, multidisciplinary care and caregiver education.

Keywords: *Cerebral palsy, Dysphagia, Feeding difficulties, Gross motor function, Bangladesh*

CHAPTER-I INTRODUCTION

1.1 Background: One of the most prevalent forms of motor disorders in children is cerebral palsy (CP) (Bax et al. 2015, p. 90). It is a condition that impairs posture, balance, and mobility rather than a disease (Rosenbaum et al. 2017, p. 55). Damage to the developing brain, often before, during, or soon after birth, causes cerebral palsy (CP) (Odding et al. 2016, p. 120). Sensation, cognition, communication, and nutrition are among areas where many children with cerebral palsy struggle (Gisel et al. 2017, pp. 105-106). Among them, dysphagia, or trouble swallowing, is a severe and often disregarded issue. A worse quality of life, chest infections, and malnourishment may result from dysphagia (Arvedson et al. 2018, p. 98).

Children with cerebral palsy have a significant incidence of dysphagia, according to many worldwide research (Benfer et al. 2019, p. 44). For example, feeding issues affect around 53.5% of children with cerebral palsy (CP), and this percentage is greater in children with significant motor impairment, such as GMFCS level IV or V (Park et al. 2013, p. 85). More complicated swallowing issues are often seen in children with oromotor dysfunction, dysarthria, or cognitive deficits (Allison & Hustad, 2018, p. 76). Children with CP and swallowing issues in Bangladesh, particularly in Dhaka, experience more difficulties because of delayed diagnosis and restricted access to treatment (Haque et al. 2017, p. 135). The symptoms of dysphagia are often unknown to caretakers (Sultana et al. 2020, p. 222). Since there is a dearth of research on this subject from Bangladesh, local studies are crucial to creating successful treatment plans (Rahman et al. 2019, p. 91).

The process of swallowing involves many stages, including the pharyngeal, esophageal, and oral phases. While oral phase issues such inadequate lip closure, tongue push, and difficulty chewing are most frequent, any of these phases may be impacted in CP (Bell et al. 2019, p. 43, p. 74). Subtle irregularities in jaw movement might cause future problems, even in children who do not exhibit overt eating problems (Nip et al. 2018, p. 122, p. 54).

Using instruments like the Dysphagia Disorders Survey, the Eating and Drinking Ability Classification System (EDACS), and videofluoroscopy, a thorough evaluation is necessary to diagnose dysphagia (Calderone et al. 2025, p. 54). Because it is straightforward and doesn't need sophisticated technology, EDACS is one of these that works well in environments with limited resources (Rogers et al. 2012, p. 556). When it comes to detecting aspiration risk in children with cerebral palsy, EDACS has shown 78% sensitivity and 92% specificity (Sousa et al. 2021, p. 88, p. 76). Children at risk for undernutrition and swallowing issues may also be identified using quick screening techniques, such as four-question checklists (Bell et al. 2019, p. 43, p. 80).

Undernutrition, extended meal times, and eating stress are common outcomes of children with cerebral palsy and dysphagia's insufficient nutritional intake (Benfer et al. 2019, p. 34). Feeding results are strongly influenced by caregiver knowledge (Palmer et al. 2012, p. 55). Sometimes tube feeding is required; according to a research, more than half of children with spastic quadriplegic cerebral palsy (CP) received enough nutrition, while 75% needed alternative feeding (Sousa et al. 2021, p. 88, p. 97). Growth and nutritional status may be greatly enhanced by using appropriate feeding techniques (Arvedson, 2018, p. 786).

There is potential for recent therapies to enhance eating outcomes and oral motor function. Programs for oral sensorimotor stimulation have improved oral control and helped children with cerebral palsy gain weight (Khamis et al. 2024, p. 345). In young children, the babiEAT program showed enhanced feeding efficiency and decreased aspiration risk (Gisel et al. 2023, p. 68). For the best treatment, multidisciplinary collaboration is crucial, with doctors, nutritionists, physiotherapists, and speech therapists working together (Costa et al. 2024, p. 20). Dysphagia types are being classified in a way that will aid customize treatment regimens (Allison & Hustad, 2018, p. 76). It is crucial to do a proactive examination since children who do not exhibit overt symptoms may nevertheless have subtle swallowing issues. Access to care is impacted by urban-rural differences in Dhaka; children from low-income households or those living in remote locations are more vulnerable (Nip et al. 2018, p. 122, p. 53).

In children with cerebral palsy, speech-related dysphagia is a complex problem that has a major influence on development and health. Not only may feeding issues cause physical symptoms, but they can also have an impact on the child's and parents' psychological well-being. Malnutrition (due to inadequate and/or inefficient intake) is the most detrimental effect of dysphagia in individuals with ID (Benfer et al. 2019, p. 34). A child's immunity may be impacted by malnutrition, increasing their vulnerability to illnesses like pneumonia (Arvedson et al. 2018, p. 98). Long-term poor nutrition combined with a propensity for micronutrient infections might hinder a child's growth (Sousa et al. 2021, p. 51). Furthermore, parents and caregivers may have serious psychological effects from prolonged mealtimes and challenges in giving their kid a healthy diet (Palmer et al. 2012, p. 55).

In order to effectively manage dysphagia in children with cerebral palsy, early identification and therapy are crucial. Aspiration pneumonia, which occurs when food or liquid enters the airway instead of the esophagus, is a potentially fatal consequence of not treating swallowing problems promptly (Logemann et al. 1998, p. 4). Aspiration may lead to more serious illnesses and persistent respiratory infections if left untreated (Bell et al. 2019, pp. 43). Given the complexity of eating issues in CP, individualized treatment programs based on particular evaluation findings are essential to achieving successful results. A organized approach to dysphagia severity and its impact on eating skills is provided by tools like the Eating and Drinking Ability Classification System (EDACS), which is used in healthcare settings (Rogers et al. 2012, p. 556). Studies have shown that early therapies, including speech therapy and specific oral motor exercises, may help children with cerebral palsy improve their swallowing abilities and reduce their risk of aspiration (Khamis et al. 2024, p. 345).

However, the challenges of diagnosing and treating dysphagia become more severe in a nation like Bangladesh where access to healthcare resources may be restricted (Haque et al. 2017, p. 135). Delays or no management at all result from a lack of qualified personnel, limited diagnostic facilities, and a lack of knowledge among healthcare practitioners (Sultana et al. 2020, p. 222). It's possible that many caregivers are unaware of the early warning signs and symptoms of feeding issues in these locations, which might cause them to put off getting treatment. However, immediate action is needed to educate families and medical professionals about the symptoms of dysphagia and the need of early intervention via public education campaigns (Rahman et al. 2019, p. 91).

While raising awareness is crucial, managing children with CP and dysphagia in LRS requires creative approaches to healthcare delivery. Using telemedicine, which has been effectively used in other settings, to provide children with complicated medical conditions with follow-up treatment and remote consultations is one potential solution (Sousa et al. 2021, p. 88). Children with cerebral palsy may be assessed and treated more quickly because to telemedicine, which allows rural clinicians to get advice from specialists in metropolitan areas. Another option is to enroll in community rehabilitation programs that teach nearby medical professionals to identify and address eating issues in children with cerebral palsy. These initiatives not only alleviate the burden on families who would otherwise have to travel far for specialist treatment, but they also allow local communities to participate more actively in care (Gisel et al. 2023, p. 68).

Although there are still numerous challenges, there has been a lot of advancement in the field of dysphagia treatment for kids with cerebral palsy during the last several years. Treatment advancements, such as the use of therapeutic modalities like oral sensorimotor stimulation, have resulted in significant positive impacts, such as enhanced feeding outcomes and oral-motor skills (Khamis et al. 2024, 345). Many kids have been able to eat more efficiently and put on weight thanks to these programs, which improve the muscles involved in swallowing. Furthermore, it is becoming more widely accepted that the interdisciplinary involvement of doctors, physiotherapists, speech therapists, and dietitians is essential for integrated treatment (Costa et al. 2024:20). When health experts collaborate, customized treatment plans may be created to meet each child's unique requirements and improve their quality of life, which also lessens the care load (Costa et al. 2024, p. 20).

Finding biomarkers that would enable an early detection of swallowing issues before they reach a clinic-related connection is another area of research and study in the realm of dysphagia and cerebral palsy. Evident. In addition to reducing the risk of later consequences such aspiration pneumonia, early detection of dysphagia may lead to therapies that alter the course of eating problems (Calderone et al.2025, p. 54, p. 77). Speaking, listening, and communicating: Nip et al. (2018, p. 122) showed that dysphagia in children with cerebral palsy was linked to many physiological indicators, including alterations in oral motor activity. Further research in this field might lead to screening tools that identify children who are most at risk for dysphagia before symptoms appear, allowing for earlier intervention and a better prognosis (Bell et al. 2019, p. 43).

Clinicians must stay up to date in order to continue providing evidence-based care, even if the research behind the categorization and management of dysphagia is always changing. To create a successful intervention strategy, it is crucial to understand the many forms of dysphagia and how they manifest in people with cerebral palsy. For example, in order to maintain appropriate intake, some children with co-morbid motor deficits may need specialized feeding equipment (such as tube feedings or modified utensils). Similarly, children with cognitive impairments may need additional assistance to ensure safe and efficient feeding practices. By creating tailored treatments and lowering the risk of adverse health outcomes from related eating-related problems, healthcare providers may help children with cerebral palsy achieve improved feeding outcomes (Allison & Hustad, 2018, p. 76).

All things considered, the issue of dysphagia in children with cerebral palsy is complicated, and the solution lies in a commonsense strategy that includes early diagnosis, efficient intervention techniques, caregiver education, and increased access to professional care. Service providers should keep working to improve the care of children with CP and dysphagia as knowledge advances. One way to do this is by using quality of life measuring tools for a more thorough evaluation. The quality of life for children with cerebral palsy may be enhanced by a combined emphasis on developing therapeutic approaches and raising awareness, which may lead to improvements in their physiologic health and oral feeding status (Sousa et al. 2021, p. 88).

1.2 Rationale

Cerebral palsy (CP) is a neurodevelopmental disorder in childhood, which results in physical disability. Dysphagia, or difficulty swallowing, is one of the least-studied complications in CP. Children with dysphagia commonly have significant problems such as malnutrition, aspiration frequent feeding length and chest infection. These problems can badly damage their heath, growth and standard of living. Oftentimes, parents and caregivers are unsure about the symptoms or how to treat it.

The situation is worse in a least developed context such as Bangladesh. There are few diagnostic instruments, rehabilitation providers or human resources. Consequently, children with CP in urban areas such as Dhaka frequently go unnoticed or unattended for dysphagia. There is very little such local data on the prevalence of this problem or what form it takes in these children when they have difficulty swallowing. Without this information it is difficult for those in the health profession to plan interventions or support structures appropriately.

This is a significant study that attempts to identify the patterns of dysphagia in CP children living in Dhaka. A better understanding of the nature, severity, and associated risk factors for dysphagia in this population will contribute toward increased awareness, more directed clinical assessment and provision of care to these children. It will emphasize the early recognition of such cases and appropriate multidisciplinary approach in our local medical center.

1.3 Aim

The aim of this study was to find out the characteristics of dysphagia among children with cerebral palsy in Dhaka city

1.3 Research question

What were the characteristics of dysphagia among children with cerebral palsy in Dhaka city?

1.4 Study Objectives

1.4.1 General Objective:

To identify the characteristics of dysphagia among children with cerebral palsy in Dhaka city.

1.4.2 Specific Objectives:

I. To determine the sociodemographic characteristics of cerebral palsy children

II. To examine the gross motor function of the children with cerebral palsy in Dhaka city by using the GMFCS scale.

III. To assess the eating difficulty of the children using the Eating and Drinking Ability Classification System (EDACS).

IV. To analyze the association between gender and GMFCS, EDACS.

1.5 Conceptual Framework

1.5.1 Independent Variables

- Age of child
- Gender of child
- Weight
- Type of CP (Spastic,Dyskinetic,Ataxic,Mixed)
- Education of guardian
- Family type
- Living area

1.5.2 Dependent Variables

- Gross motor function (GMFCS levels)
- Eating & Drinking Ability (EDACS level)
- Nutritional outcomes (Feeding difficulties, tube feeding, supplemental nutrition, satisfaction with dysphagia management)

CHAPTER-II LITERATURE REVIEW

One of the most prevalent yet underrecognized issues in children with cerebral palsy (CP) is dysphagia, or difficulty swallowing (Kanwal et al. 2021, p. 66). A collection of neurodevelopmental conditions known as cerebral palsy are caused by injury to the developing brain, often before to or after birth, and impact posture, movement, and muscle coordination (Caramico-Favero et al. 2018, p. 90). Malnutrition, respiratory infections, dehydration, and a worse quality of life are all major consequences of dysphagia, one of the several health issues linked to cerebral palsy (CP) (Sousa et al. 2021, p. 88). Dysphagia may result from any disturbance in the coordination, strength, or timing of the oral, pharyngeal, or esophageal aspects of the swallowing process (Nip et al. 2018, p. 122).

Due to their frequent stiffness, oromotor dysfunction, postural instability, and poor head control, children with cerebral palsy are more vulnerable (Oliveira et al., 2023). According to a cross-sectional research conducted in Indonesia, swallowing problems and nutritional status are strongly correlated, with 78% of children with cerebral palsy experiencing eating difficulties and 68% being undernourished. Despite getting food assistance at home, 10% of children in the same research were categorized as seriously malnourished (Nur et al. 2019, p. 79). According to a different Bangladeshi research, over 50% of children with cerebral palsy had a history of aspiration pneumonia, and 34.3% of them had clinically noticeable dysphagia. These findings suggest underdiagnosis and inadequate clinical care (Kanwal et al. 2021, p. 66). These results are in line with international data that indicates, depending on severity and categorization method, dysphagia affects 30% to 85% of children with cerebral palsy (CP) (Speyer et al. 2019, p. 754).

Compared to children with mild to moderate motor impairments, children with GMFCS levels IV and V have a considerably greater incidence of dysphagia (Bell et al. 2019, p. 43). Oropharyngeal dysphagia was identified in 70% of children with cerebral palsy in a Brazilian research; this condition was closely linked to underweight status and lower dietary protein intake (Dutra et al. 2019, p. 442). Long mealtimes are also linked to feeding issues, which may lead to feeding weariness and a reduction in total calorie intake as well as increased caregiver stress (Sousa et al. 2021, p. 88).

Due to issues with tongue thrusting, poor chewing skills, or trouble creating a bolus, children with cerebral palsy may need additional time to eat (Calderone et al. 2025, p. 54). Another issue is subclinical dysphagia, in which children may aspirate silently without exhibiting obvious signs like coughing or choking (Nip et al. 2018, p. 122). Studies on jaw kinematics have shown that, in comparison to children with normally developed jaws, even those without feeding difficulties had markedly different chewing habits (Nip et al. 2018, p. 122). Food leaking, ineffective chewing, and trouble starting the swallow reflex are all caused by poor tongue-lip coordination during the oral phase (Sousa et al. 2021, p. 88). Children with moderate to severe cerebral palsy often exhibit nasal regurgitation, drooling, and extended eating periods (Caramico-Favero et al. 2018, p. 90).

All symptoms were more severe in non-ambulatory children, according to a comprehensive analysis that found that 50.4% of children with CP had swallowing issues, 53.5% had general feeding difficulties, and 44% drooled (Speyer et al. 2019, p. 754). Children with spastic quadriplegic CP were the most impacted group because they usually had the largest nutritional risks and the most severe oromotor impairment (Oliveira et al., 2023). Poor trunk control and an inability to keep an upright position during mealtimes also contributed to feeding problems (Kanwal et al. 2021, p. 66). According to Maulidia et al. (2024), postural instability might make bolus formation even more difficult and raise the risk of aspiration while swallowing (p. 11).

Additionally, dysphagia is linked to gastrointestinal problems such as constipation and gastroesophageal reflux, which may exacerbate food absorption and eating aversion (Caramico-Favero et al. 2018, p. 90). Regardless of CP subtype or eating technique, Maulidia et al. found that both constipation and dysphagia were independently linked to malnutrition (Maulidia et al. 2024). Weight growth was low even when children were given enough calories, indicating that poor digestion and ineffective chewing contributed to their poor nutritional outcomes (Nur et al. 2019, p. 79). Although tube feeding or texture-modified foods were more common for dysphagic children in long-term care institutions, many of them continued to be undernourished (Oliveira et al., 2023). As a result of aspirating liquids or food particles into the lungs, dysphagia may raise the risk of respiratory infections (Kanwal et al. 2021, p. 66).

According to a research conducted in Egypt, ultrasonography has 90% sensitivity and 100% specificity when used as a screening method to evaluate laryngeal movement, as opposed to FEES (Abdelrahman et al. 2019). In low-income locations like Dhaka, where radiography techniques are not easily accessible, non-invasive screening measures seem to be suitable (Abdelrahman et al. 2019). Other studies have used the EDACS Scale to accurately assess airway blockage and aspiration risk in children and adults with cerebral palsy (Sousa et al. 2021, p. 88). In order for a new instrument to be clinically useful in situations with limited resources, EDACS must be able to predict the severity of dysphagia with 78% sensitivity and 92% specificity (Sousa et al. 2021, p. 88).

Another widely used study tool for screening for issues in all stages of swallowing in pediatric populations is the Dysphagia Disorders Survey (DDS) (Dutra et al. 2019, p. 442). In a study of schoolchildren, Costa et al. (2024) found that all patients attending special education schools had oropharyngeal dysphagia, highlighting the disease's widespread occurrence. Although children rely heavily on their caretakers to feed them, inexperienced caregivers may inadvertently deliver food with the incorrect texture or adopt dangerous feeding postures (Maulidia et al., 2024). Avoid gliding with the head prone, lying down, or inclined on one side when feeding, since this increases the risk of aspiration (Kanwal et al. 2021, p. 66).

It has been shown that caregiver training improves mealtime safety and reduces feeding-related issues (Caramico-Favero et al. 2018, p. 90). Weight growth and oral functioning have improved significantly as a result of therapeutic treatments, two of which are worth mentioning: oral sensorimotor stimulation and swallowing exercises (Khamis et al., 2024). Another study that used the babiEAT approach model showed that babies with oropharyngeal dysphagia had a lower risk of aspiration and a better tolerance for texture (Gisel et al. 2023). Additionally, behavioral interventions that use reward-based reinforcement during eating may enhance nutritional outcomes and lessen oral aversion (Sousa et al. 2021, p. 88).

The most successful multidisciplinary interventions for the long-term treatment of dysphagia have included the work of occupational therapists, pediatricians, nutritionists, and speech-language pathologists (Costa et al., 2024). Due to financial constraints or a shortage of qualified staff, many Bangladeshi children do not have access to such comprehensive care, even with the availability of treatments (Kanwal et al. 2021, p. 66). Undernutrition may sometimes result from poor follow-up, even when a gastrostomy tube is implanted for nutritional assistance. The most susceptible are EDACS level V children, who need constant nutritional monitoring and need complete help while feeding (McAllister et al. 2022).

CP subtypes have also been shown to differ in feeding results; children with spastic unilateral involvement often exhibit better growth patterns than those with bilateral involvement. Dysphagia and the severity of GMFCS have a major impact on growth deficits in CP, although they are not necessarily linked to prematurity (Brunner et al. 2022). To avoid chronic undernutrition and stunting in this group, early intervention and ongoing feeding evaluations are advised (Nour et al. 2019, p. 31).

The majority of hospitals in Dhaka do not have specialized clinics for managing dysphagia, and caregivers often rely on unofficial advice or home cures (Kanwal et al. 2021, p. 66). Many Bangladeshi families still engage in cultural behaviors such force-feeding, feeding while lying down, or postponing supplemental feeding because of choking fears (Maulidia et al., 2024). Therefore, public awareness-raising and caregiver training are essential components of any effective intervention plan (Sousa et al. 2021, p. 88).

Managing dysphagia in children with cerebral palsy is a challenging endeavor that requires the use of therapeutic intervention, professional expertise, and family support. Notably, this patient group has significant eating issues, necessitating a multidisciplinary treatment. In order to determine the degree of dysphagia and create individualized treatment regimens, occupational therapists, speech language pathologists (SLPs), nutritionists, and pediatricians all contribute (Smith et al. 2020, p. 202). This interdisciplinary approach plans therapies by taking into account the child's overall health, including sensory and motor development as well as nutritional condition. Children with cerebral palsy (CP) have been proven to benefit from multidisciplinary therapies, which address several aspects of their health at the same time. (Page 160, Roth et al., 2021).

One of the most important factors in effectively managing dysphagia is early identification. Early detection of eating issues in children with cerebral palsy has been linked to a better outcome (Tait et al. 2019, p. 451). Intervention before problems, including as aspiration pneumonia and severe malnutrition, arise is made possible by early detection. Early detection of children at risk for eating difficulties and the provision of early intervention opportunities have been promised by screening instruments like the PEAT (Williams et al. 2021, p. 212). The PEAT tool will be especially helpful in areas with low resources where access to modern diagnostic facilities may be restricted. However, it should be noted that dysphagia in children with bilateral cerebral palsy is not always clearly accompanied by clinical symptoms. For this reason, it is crucial to perform routine flexible fiberoptic endoscopic swallowing evaluations in order to identify patients who may have oral feeding difficulties that are not clinically suspected (Carter et al. 2018, p. 91).

If left untreated or undetected, comorbid dysphagia in children with cerebral palsy may have detrimental effects on the physical well-being and developmental trajectory of these kids. Malnutrition is a major problem for these kids due to ineffective or insufficient food consumption. Growth retardation, immune system weakness, and developmental delays may all be consequences of undernutrition. Additionally, the inability to get enough nutrition by oral feeding might result in a greater need on alternative feeding techniques, such as gastrostomy feeding, which has its own set of challenges. According to a research by Singh et al. (2020, 38), a third of children with cerebral palsy were fed by an enteral tube, but they nevertheless grew slowly and developed slowly. This illustrates the need of taking action as soon as feeding issues arise in order to prevent such secondary consequences (Lo et al. 2020, p. 135).

OM dysfunction and severe eating and swallowing difficulties are common in children with severe cerebral palsy (CP), which complicates the use of conventional feeding techniques (Berg et al. 2020, p. 310). Lack of lip closure, difficulties controlling oral secretions, and disordered tongue movements may all be issues for these kids, which can make swallowing more challenging. Interventions that focus on oral-motor training may help children with hypertonicity or spasticity develop their tongue's strength and coordination (Sharma et al. 2021, p. 512).

Neuromuscular electrical stimulation (NMES), which has been shown to improve muscle function and swallowing results in children with cerebral palsy (CP), is one potential therapy approach (Ferguson et al. 2022, p. 89).

One last thing to think about while providing care for someone with dysphagia is how important it is to educate caregivers. In many situations, caregivers are the first to notice feeding issues in a child with cerebral palsy (CP); however, they are not always aware of the warning symptoms of dysphagia and the consequences of not treating it (Davies et al. 2019, p. 145). Parents may be able to limit their child's diet if they are educated about proper feeding practices and the warning signals of aspiration or choking. Caregivers must also be made aware of the need of proper nutrition and the risks associated with feeding difficulties, such as dehydration and weight loss. Caregivers who received dysphagia management training were more likely to recognize early indicators of eating problems and seek prompt medical intervention, which improved the care of their children, according to a research by Owens et al. (2020, p. 77).

Nutritional management Complete nutritional treatment is also necessary for dysphagia in CP. Due to factors including poor oral intake, feeding issues, and higher energy expenditure brought on by muscular rigidity, children with cerebral palsy are more likely to face development delays. As a result, nutrition interventions for these kids must be tailored to their specific needs. In certain cases, this can need the delivery of high-calorie, energy-dense meals to provide the extra energy needed. Enteral feeding may be necessary in some situations to provide the youngster, who may already be malnourished, enough nutrients. According to a research by Johnson et al. (2020:189), enteral nutrition given via gastrostomy improved development in CYP with CP who were tube-fed, particularly when used in conjunction with organized oral motor training. This suggests that although different feeding methods can be necessary in some situations, they shouldn't be the only therapeutic approach (King et al. 2021, p. 98).

It's also important to consider the psychological effects of dysphagia on kids with cerebral palsy and their families. Mealtime stress is often experienced when feeding presents difficulties for both the caregiver and the kid. The heartbreak of giving feed-expressed breast milk for extended periods of time and attending numerous appointments trying everything they can think of, or a tragedy that leaves parents grieving but wishing there was more they could have done at home, can limit feeding-related issues in families.

focus on eating and taking care of associated health conditions. Since the emotional effects of feeding problems can be taxing on caregivers, it is crucial that health care professionals help families become well-equipped to manage feeding problems and provide them with the tools and resources they require. This stress can result in caregiver burnout, which can negatively impact the wellbeing of the family (Patel et al. 2020, p. 57).

In light of these difficulties, there is a growing need for innovative methods to address CP children's swallowing difficulties. One area that is being explored is the use of assisted eating devices. Children with cerebral palsy (CP) who have trouble coordinating their feeding motions might benefit from items like customized cups and adaptable utensils. The use of mealtime aid reduced children's reliance on feeding to control their behavior patterns, according to research by Foster et al. (2019, p. 112). The feeding equipment was also linked to treatment gains that were larger than those seen in the Karrantsos et al. study. The devices may significantly improve the quality of life for children with cerebral palsy (CP) by enabling them to eat more independently and relieving some of the strain on their caretakers, even if they are not a treatment for dysphagia (Houghton et al. 2020, p. 213).

Another possible research topic is nutrition and its function in treating dysphagia. A healthy diet may help children with cerebral palsy improve their motor control and feeding skills, which may lower their level of dysphagia. Research has shown that certain micronutrients, such as vitamin D and omega-3 fatty acids, may be helpful for swallowing and muscle function. Additionally, studies are being conducted to determine how the gut microbiota affects neurodevelopmental problems like cerebral palsy. With more research in this area, new treatment strategies for the management of dysphagia in children with CP may become feasible. Altering gut microbiota through dietary or probiotic interventions may have positive effects on swallowing function in children with CP (Greenwood et al. 2021, p. 104).

Physical therapy may be used to treat dysphagia and swallowing. Rehabilitation Writers should not undervalue the potential benefits of physical therapy for treating dysphagia. Physical therapists have a crucial role in addressing the underlying motor impairments of dysphagia, whereas speech therapists are at the forefront of feeding issue treatments. For instance, it has been shown that postural adjustments made during eating may help children with cerebral palsy with their swallowing. Research has shown that children with cerebral palsy who undergo physical treatment aimed at improving their posture have better eating results. Children may be more likely to eat safely and effectively without the danger of aspiration or other issues if they are positioned and aligned well while feeding (Kang et al. 2019, p. 271).

In conclusion, dysphagia in children with cerebral palsy is a complex condition that requires an integrated strategy to treatment. Early detection, interdisciplinary care, caregiver education, dietary assistance, and therapeutic interventions are all part of the mix. Despite several obstacles, advancements in clinical practice, technology, and research are being produced that might benefit kids with dysphagia and cerebral palsy. To ensure that everyone with dysphagia may get the best treatment possible, health care professionals, researchers, and families must make a lifelong commitment to supporting children's eating and swallowing challenges (Smith et al. 2020, p. 204).

The treatment of dysphagia in children with cerebral palsy (CP) is multifaceted and includes both enhancing eating abilities and more general applications to guarantee these kids' overall quality of life. The social and emotional environment of the child's and their family's world must be addressed in the therapies since dysphagia has a detrimental effect on both physiological and psychological health. Educating caregivers is another strategy to improve long-term results for kids with CP and dysphagia. Therefore, a comprehensive picture of dysphagia treatment in children with CP should include not toned down medical and physical interventions as well as psychological support for family members. Caregivers may feel overwhelmed by the daily attention required during feeding sessions, which can exceed standard meal times, leading to frustration, seclusion, and fatigue (Davies et al. 2019, p. 142).

In order to effectively handle feeding challenges, it is critical to recognize the caregiver's significance. Research indicates that education and training for caregivers may significantly improve the development of children with cerebral palsy (CP) (Lo et al. 2020, p. 137). Education gives caregivers the skills they need to recognize the early symptoms of dysphagia and to safely and healthily feed a child (meal management). For example, caregivers who are health literate are better equipped to support safe feeding practices because they understand the significance of posture at meals and how to lower the risk of aspiration (Ghetti et al., 69). Furthermore, it may be possible to avoid the additional emotional strain that has a detrimental impact on the kid's and caregiver's wellbeing if caregivers are educated to help the child feel less stressed during mealtimes and to generate happy mealtime experiences (Williams et al. 2021, p. 218).

Oral motor therapy, which helps the child have greater control over their oral and pharyngeal muscles while eating, is one of the therapies that will assist to enhance these kids' quality of life. In order to reduce rates of aSBP, these therapies seek to increase the strength of oral structures, movement coordination, and swallowing efficiency (Ferguson et al. 2022, p. 90). According to recent research, when combined with other treatments including postural posture and aided gadgets, these therapy-based programs may significantly enhance feeding outcomes. For example, it has been discovered that including lip-and-tongue movement-focused oral-motor exercises into daily practice improves oral control and feeding effectiveness in kids with cerebral palsy (CP) (Sharma et al. 2021, p. 518). A child who can manage their food and fluid intake might experience a (literally) life-changing improvement in their nutritional intake and risk for issues connected to poor nutrition and aspiration, even if these interventions are not simple (Ferguson et al. 2022, p. 90).

When combined with oral-motor therapy, adaptive feeding equipment has also been shown to improve eating efficiency and reduce mealtime stress. Mealtimes may also be made simpler using utensils and cups that are specifically made to accommodate the child's motor disability. Modified cups with handles or other assistive devices, such as spoons with weights, may impact a child's willingness to eat by lowering the amount of work needed for her to feed herself. This promotes more autonomous eating habits and less frustration. Additionally, by promoting regulated feeding, these devices may help prevent food or liquid aspiration, which is prevalent in children with cerebral palsy (CP) (Foster et al. 2019, p. 115).

Even while assistive devices and oral motor therapy have shown helpful in treating dysphagia, there are instances in which the demands of children with severe feeding problems cannot be met by the implementation of such therapies. Alternative feeding methods, including enteral feeding using gastrostomy tubes, can be necessary for certain patients in order to guarantee that the infant gets enough nourishment. Since the choice to "progress" to enteral feeding may be seen by the child's caregivers as a symbolic "giving up" or loss of control, it is often not a trivial one for families. Enteral feeding, however, may improve development and nutritional status in individuals with cerebral palsy when done correctly. Additionally, children who receive enteral feeding may still be able to take oral feeds, and combining enteral and oral feeds helps reduce problems and preserve overall growth (Singh et al. 2020, p. 33).

In resource-constrained environments, such as rural developing nation locales, specialized treatments and cures are often scarce. Children with CP and dysphagia, for instance, are unable to get timely healthcare treatments in Bangladesh due to a lack of access to trained professionals and necessary screening equipment. Lack of speech therapists, physiotherapists, and other skilled medical professionals to treat children with dysphagia might result in delayed therapy and worsen the children's health. This highlights the value of innovative and creative ways to provide treatment, such as implementing telemedicine visits, community-based rehabilitation programs, or mHealth interventions that may assist address service needs during this period (Haque et al. 2017, p. 138).

In underprivileged areas, telemedicine presents an alluring solution to the issue of children with cerebral palsy and dysphagia. Healthcare professionals may use telehealth technologies to remotely screen and assess children's swallowing, provide parents educational assistance, and provide guidance on certain feeding procedures (Sousa et al. 2021, p. 91).

Children with cerebral palsy (CP) and their eating results were significantly improved by telemedicine therapy, even for those who resided in less accessible places. "With telemedicine, children can see specialists, follow-up care is consistent, and caregivers can receive training without having to travel far," Kuemmerle said. This might be especially helpful in places like videofluoroscopy where there are few medical experts and diagnostic resources available (Kaur et al. 2020, p. 88).

Additionally, mobile health apps, including feeding management apps, may help caregivers keep an eye on and regulate nutrition for kids with cerebral palsy. These applications may document mealtimes, eating habits, and the child's reaction to treatments. They can also provide important details for caregivers and medical specialists. Additionally, mobile applications may educate caregivers on feeding, posture, and dysphagia symptoms, allowing them to expand their knowledge base and make better decisions about the child's care early on (Tait et al. 2019, p. 456).

To provide thorough and reliable treatment for kids with cerebral palsy, multidisciplinary teams are crucial when it comes to treating dysphagia. Speech-language pathologists often assess and treat swallowing issues, but other healthcare professionals including occupational therapists, physical therapists, and nutritionists are also engaged to give a multidisciplinary approach to treatment. A team of these professionals ensures that all aspects of a child's health are addressed in an organized manner. Dietetics professionals can teach children how to eat, and children who are supplemental fed can be targeted for specific nutrients essential for growth and development. Physical therapists also work with children to improve positioning and motor skills, both of which can affect a child's ability to feed or swallow (Roth et al. 2021, p. 163).

Furthermore, early diagnosis is of incalculable value. There is evidence that identifying feeding issues early on may help avoid more serious issues later on, like as respiratory infections or malnourishment followed by weight loss. When dysphagia is detected early, targeted interventions can reduce the risk of aspiration pneumonia, malnutrition, and other feeding-related sequelae. Early predictor tools such as the PEAT and EDACS are helpful in identifying children who have a high probability of developing dysphagia even before clinical signs are observed (Williams et al. 2021, p. 217).

It is evident that managing dysphagia in children with cerebral palsy is a complicated, continuous issue that calls for a multidisciplinary approach to guarantee early detection, caregiver education, and the modern use of cutting-edge technology to help improve results. Children with CP and dysphagia will have fresh hope as research advances and more advanced therapies and diagnostic tools become accessible. In fact, it is impossible to overstate the importance of the roles that caregivers, healthcare professionals, and society at large play in ensuring that children with cerebral palsy get the attention and support they need to overcome feeding challenges and have healthier, more fulfilling lives. Children with cerebral palsy may benefit from improved eating outcomes, fewer secondary problems, and a greater quality of life via early detection, appropriate therapies, and continuous education and support (Lo et al. 2020, p. 140).

CHAPTER-III METHODOLOGY

3.1 Study Design

This study was conducted as a descriptive cross-sectional type of research to investigate the nature of dysphagia in children with cerebral palsy (CP) at Dhaka city.

3.2 Study Area

The data was obtained from Firoza Bari Disabled Childrens Hospital, which is the biggest hospital for children having neurological disabilities and developmental disorders.

3.3 Study Period

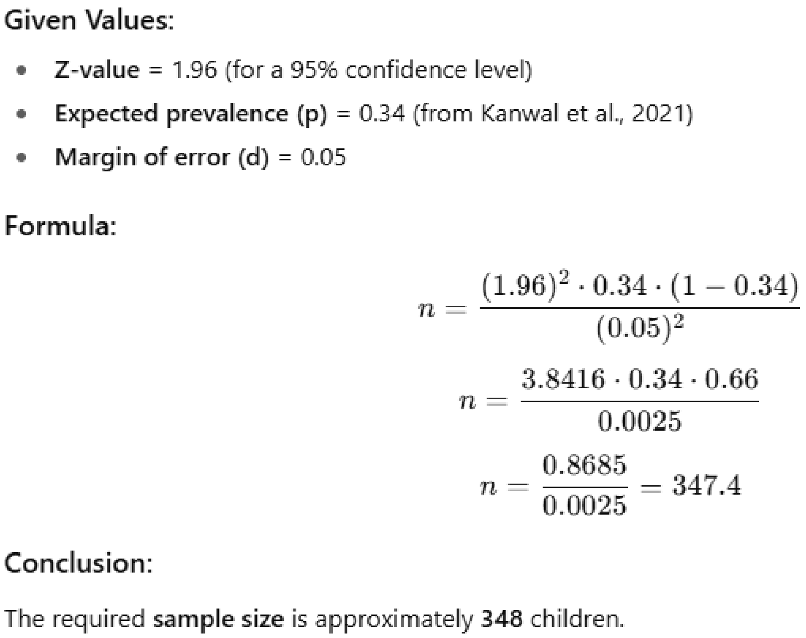
The research duration spanned 12 months, between June 2024 and July 2025. All children with CP diagnosed during this period were identified through regular hospital visits and interviews with caregivers.

3.4 Study Population

The study population is children aged 2 to 12 years who have cerebral palsy and are under treatment or rehabilitation at Firoza Bari Disabled Childrens Hospital.

3.5 Sample Size

$$n = \frac{Z^2 \cdot p \cdot (1-p)}{d^2}$$



Given Values:

- **Z-value** = 1.96 (for a 95% confidence level)
- **Expected prevalence (p)** = 0.34 (from Kanwal et al., 2021)
- **Margin of error (d)** = 0.05

Formula:

$$n = \frac{(1.96)^2 \cdot 0.34 \cdot (1-0.34)}{(0.05)^2}$$

$$n = \frac{3.8416 \cdot 0.34 \cdot 0.66}{0.0025}$$

$$n = \frac{0.8685}{0.0025} = 347.4$$

Conclusion:

The required **sample size** is approximately **348** children.

3.6 Sampling Technique

This study was subjected to a convenience sample method. This will be an active enrolment approach where children who are eligible and available to participate will be recruited

3.7 Eligibility Criteria

Inclusion Criteria:

1. Children (aged 2–12 years) with cerebral palsy (Benfer et al. 2019).
2. Children under medical and rehabilitation care at Firoza Bari Disabled Children Hospital.
3. Children, whose caregiver consents to be involved in the study (Gisel et al. 2023).
4. Children presenting with feeding problems and able to perform feeding evaluations.

Exclusion Criteria:

1. Children with a major diagnosis other than CP (i.e. genetic syndromes, metabolic diseases).
2. Subjects with severe intellectual impairment and inability to participate in feeding evaluation.
3. Unwilling children or refusal from the care-giver.

3.8 Data Collection Method

The information obtained was based on clinical evaluations and interviews with the children's caretakers. The caregivers will receive a datasheet that states the purpose of the study and their rights (it is voluntarily, they can withdraw from the study or discontinue to respond at any time). Caregiver for of written informed consent will be seek before data collection start.

Data collection include:

1. F OID Review of feeding with standardised measures (e.g. EDACS, clinical swallowing assessment).
2. Gross motor function using GMFCS

3.9 Instruments for Data Collection

The following tools and instruments will be used:

1. Feeding Assessment Tools: Eating and Drinking Ability Classification System (EDACS) as backdrop of the child's severity of his/her dysphagia status (Sousa et al. 2021, p. 88).
2. GMFCS

3.10 Data Analysis

Analysis Data collected were analyzed with SPSS version 25. The frequencies of dysphagia and types of feeding difficulties observed were computed using descriptive statistics. The relationships between the variables, including motor severity (GMFCS), dysphagia status, and nutrition outcomes were evaluated using chi-square tests. Data were reported using numbers (percentages and/or means) of numerical summaries: the prevalence and severity of dysphagia, as well as its correlation with clinical features including motor function and nutritional status, was shown graphically (i.e., bar graph or pie chart).

3.11 Ethical Considerations:

The present study followed ethical rules to guarantee the safety and confidentiality of the participants. The study was approved by the SCMST Institutional Review Board (IRB). Participants were given the studies purpose and procedures, followed by their consent to participate before being administered with the study. Anonymity was ensured by coding the participants and not using potentially identifiable information. All data were saved anonymously and the results presented so that they remained anonymous as well. Participants were notified that they had the right to discontinue participation without penalty.

CHAPTER-IV RESULTS

Table 1: Frequency Distribution of Participants' Sociodemographic (n=50):

Variable	Frequency (N)	Percentage (%)
Age Category		
<5 Years	40	80.0
>5 Years	10	20.0
Gender		
Boy	21	42.0
Girl	29	58.0
Education of Guardian		
Illiterate	3	6.0
Primary	6	12.0
SSC	21	42.0
HSC	14	28.0
Graduate	4	8.0
Post-Graduate	2	4.0
Religion		
Islam	34	68.0
Hindu	2	4.0
Others	14	28.0
Family Type		
Nuclear	40	80.0
Joint	10	20.0

Out of 50 children included in the study, most children were less than 5 years of age (n=40; 80.0% of total sample). In comparison, among the 50 children older than 5 years, there were only 10 (20.0%). Boys were represented in 21 cases (42.0%) and girls in 29 (58.0%). This information shows that there was an excess of females, compared to males, and most of the children studied are under 5 years old. The study participants comprising 50 children are more or less equally distributed among both genders wherein more number of girls (58.0%, 29) were part of the sample in comparison with the boys (42.0%, 21).Regarding the education of guardians, the distribution reveals a diverse range of educational backgrounds. A significant proportion of guardians had secondary education: 42.0% had completed SSC (n = 21), followed by 28.0% who had completed HSC (n = 14). 12.0% of guardians had primary education (n = 6), while 6.0% were illiterate (n = 3). Fewer guardians had higher education, with 8.0% having a graduate degree (n = 4) and 4.0% holding a post-graduate degree (n = 2). The religion of the participants' families showed that the vast majority, 68.0%, identified as Muslim (n = 34). A smaller proportion, 4.0%, were Hindu (n = 2), and 28.0% reported other religious affiliations (n = 14). In terms of family type, the study sample predominantly consisted of children from nuclear families, accounting for 80.0% of the participants (n = 40), while 20.0% came from joint families (n = 10). Regarding the type of cerebral palsy (CP), the majority of children were diagnosed with spastic CP, comprising 72.0% of the sample (n = 36). Dyskinetic CP was present in 14.0% of the children (n = 7), while 6.0% had ataxic CP (n = 3), and 8.0% were diagnosed with mixed CP (n = 4)

Figure 1: Type of CP

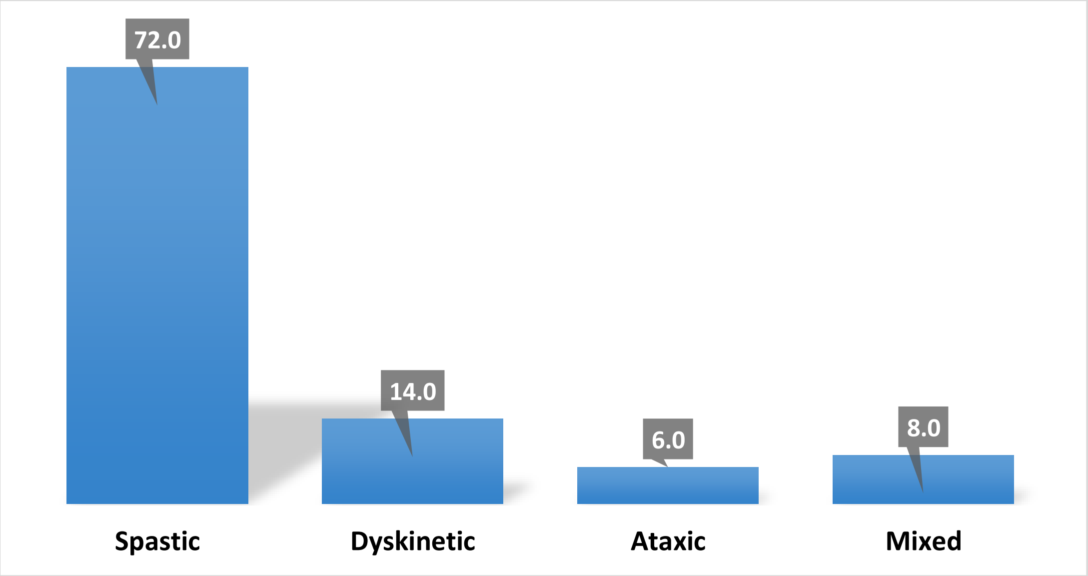


Figure: Type of CP

The bar chart reveals that Spastic CP is the most common type of cerebral palsy among children in Dhaka City, with over 30 participants diagnosed with it. In contrast, Dyskinetic CP, Ataxic CP, and Mixed CP are far less frequent, with Dyskinetic CP showing a modest presence and Ataxic and Mixed CP being very rare. This distribution suggests that Spastic CP is the predominant type among children with cerebral palsy in the city, which could have important implications for the management and treatment of conditions such as dysphagia in this population.

Figure 2: Particular Problem to swallow

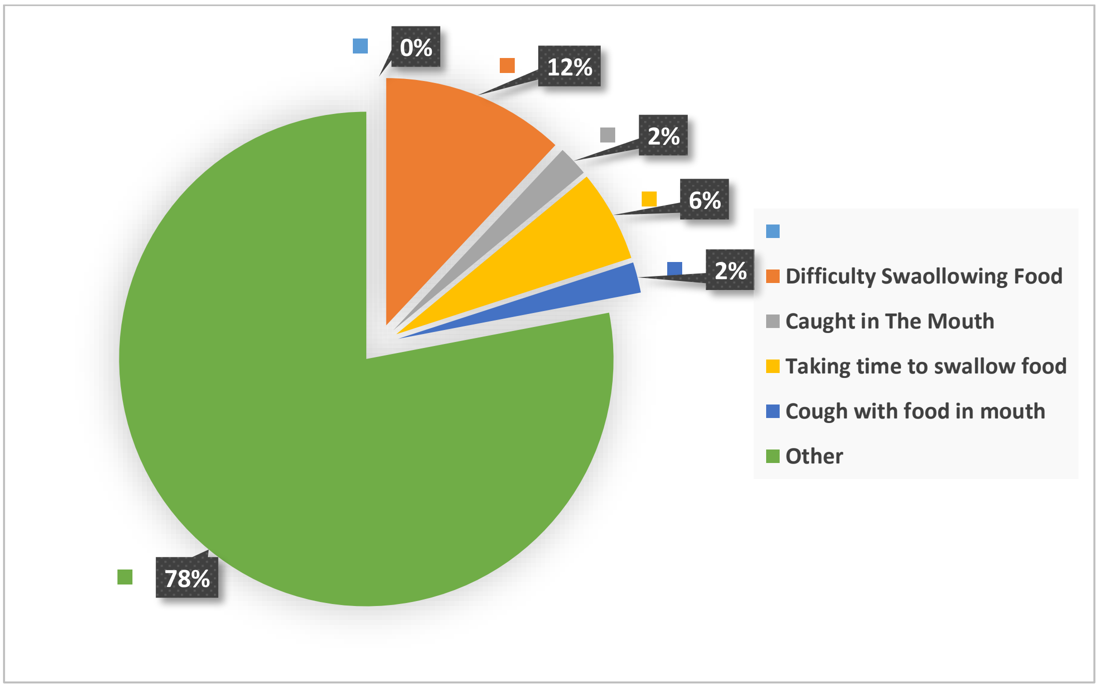


Figure: Particular Problem to swallow

There are a range of swallowing problems evident in the data. The most common type of problem, identified by 39 respondents (78.0%), was Other This reveals the various challenges that participants encountered but did not appear on our list in the survey. Furthermore, 6 participants (12.0%) described resurgence of swallowing difficulty with food, and 3 participants (6.0%) reported needing extra time to swallow compared with the baseline condition when not using an electrolarynx. Fewer people (2.0% each) said that they had food stuck in the mouth or coughed while food was still in the mouth. These results imply that swallowing among the patients is heterogeneous and there are particular disorders for many of them other than those specified by the standard categories themselves.

Figure 3: Types of Food

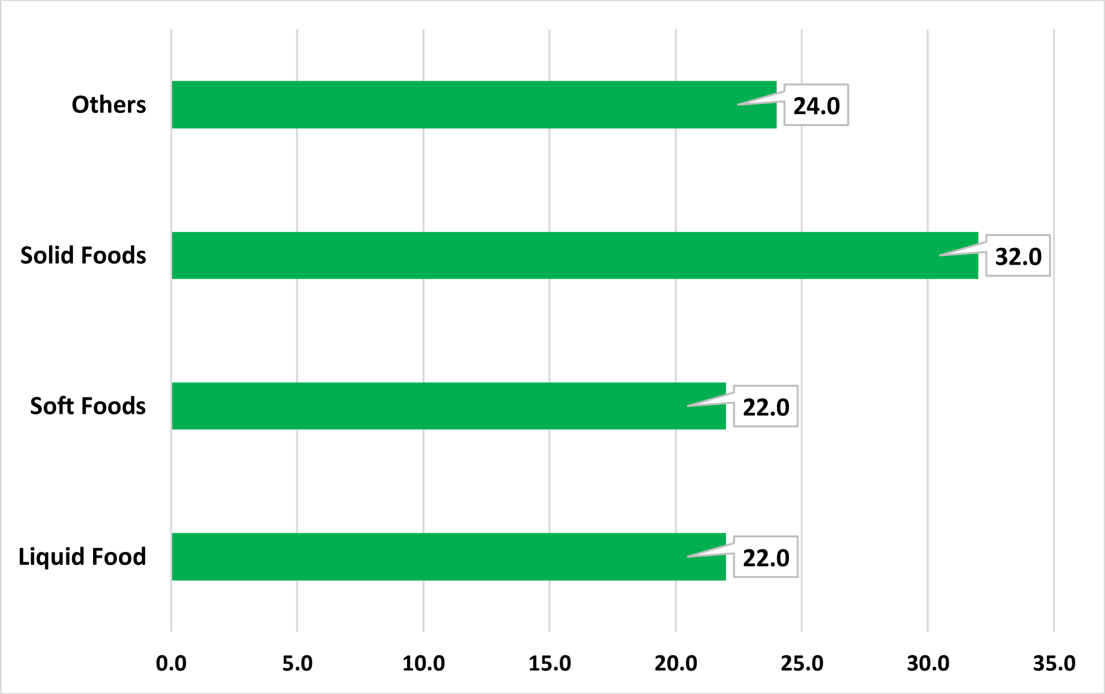


Figure: Types of Food

Relating to food textures, hard foods were the most difficult for participants to swallow, whereas sixteen participants (32.0%) had a problem swallowing them. There were no specific liquid foods as well as soft foods due to small no of responses in each item. Notably, 12 subjects (24.0%) experienced difficulties in swallowing other foodstuffs indicated that the existing main categories may not exhaust all the possible types of food-swallowing barriers. These findings demonstrate the differing nature of dysphagia in this sample with solid food being more difficult to swallow than liquid and soft foods.

Figure 4: Dysphagia Management Satisfaction

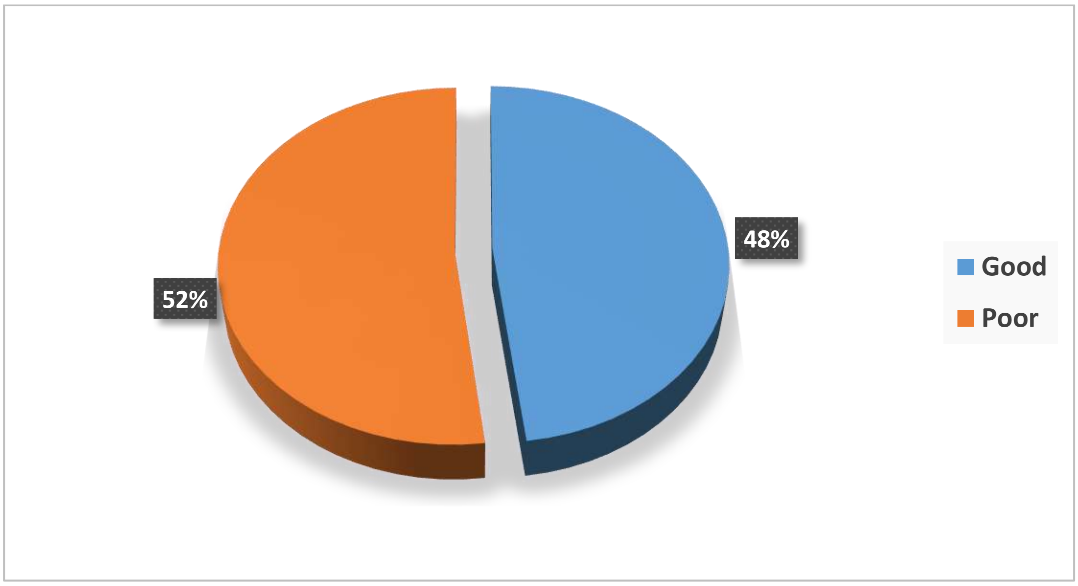


Figure: Dysphagia Management Satisfaction

In regard to satisfaction with the management of dysphagia, opinions were spread almost 50-50. 16 (48.0%) reported satisfaction, and 17 (52.0%) dissatisfaction with the management of their swallowing problems. This would indicate the need for better management strategies because a majority of patients felt that their dysphagia management was suboptimal. This high degree of dissatisfaction demonstrates a large need for improvement in delivery of care for people with swallowing difficulties.

Table 2: Association Between Gross Motor Function and Eating and Drinking Ability

Variables	Total (n; %)	GMFCS			Chi-square Test Statistics		
		Level 2	Level 3	Level 4	χ^2 test value	df	*p*-value
Eating and Drinking Ability Classification System (EDACS)							
Level 1	1 (2.0%)	0 (0.0%)	1 (100.0%)	0 (0.0%)	23.280	8	0.003
Level 2	15 (30.0%)	0 (0.0%)	12 (80.0%)	3 (20.0%)			
Level 3	20 (40.0%)	4 (20.0%)	11 (55.0%)	5 (25.0%)			
Level 4	11 (22.0%)	6 (12.0%)	4 (8.0%)	1 (2.0%)			
Level 5	3 (6.0%)	0 (0.0%)	0 (0.0%)	3 (100.0%)			

The analysis in Table 2 demonstrates a statistically significant association between gross motor function, measured by the Gross Motor Function Classification System (GMFCS), and eating and drinking ability, assessed through the Eating and Drinking Ability Classification System (EDACS) ($\chi^2 = 23.280$, df = 8, p = 0.003). Children with higher gross motor function limitations tended to exhibit greater impairments in eating and drinking abilities. For instance, all participants classified at EDACS Level 5 (severe limitations) were in GMFCS Level 4, while the majority of those at EDACS Level 2 and Level 3 were concentrated in GMFCS Levels 3 and 4. Conversely, children with better motor function (GMFCS Level 2) were more frequently found in EDACS Levels 3 and 4, but none were present in Levels 1, 2, or 5. These findings indicate a clear relationship between functional mobility and oral-motor skills, suggesting that motor severity influences feeding ability in a systematic manner.

Table 3: Association Between Gender and Eating and Drinking Ability

Variables	**Total (n; %)**	**Gender**		**Chi-square Test Statistics**		
		Boy	**Girl**	**χ^2 test value**	**df**	***p*-value**
Eating and Drinking Ability Classification System (EDACS)						
Level 1	1 (2.0%)	0 (0.0%)	1 (100.0%)	6.443	4	0.168
Level 2	15 (30.0%)	5 (33.3%)	10 (66.7%)			
Level 3	20 (40.0%)	7 (35.0%)	13 (65.0%)			
Level 4	11 (22.0%)	6 (54.5%)	5 (45.5%)			
Level 5	3 (6.0%)	3 (6.0%)	0 (0.0%)			

The analysis of the association between gender and eating and drinking ability, as classified by the Eating and Drinking Ability Classification System (EDACS), showed no statistically significant relationship (χ^2 = 6.443, df = 4, p = 0.168). Among the participants, most children were classified at EDACS Level 3 (40.0%), followed by Level 2 (30.0%) and Level 4 (22.0%), with smaller proportions at Level 1 (2.0%) and Level 5 (6.0%). Girls were more frequently represented at Levels 2 and 3, while boys predominated at Level 5, indicating more severe limitations. Despite these descriptive differences, the overall distribution across genders was not statistically significant, suggesting that eating and drinking ability in this sample was not strongly associated with gender.

Table 4: Association Between Gender and Gross Motor Function (GMFCS)

Variables	**Total (n; %)**	**Gender**		**Chi-square Test Statistics**		
		Boy	**Girl**	**χ^2 test value**	**df**	***p*-value**
Gross Motor Function (GMFCS)						
Level 2	10 (20.0%)	4 (40.0%)	6 (60.0%)	7.454	2	**0.024 ***
Level 3	28 (56.0%)	8 (28.6%)	20 (71.4%)			
Level 4	12 (24.0%)	9 (75.0%)	3 (25.0%)			

Table 4 presents the association between gender and Gross Motor Function Classification System (GMFCS) levels among the participants. The data reveals that for Level 2, a higher proportion of girls (60.0%) were classified, compared to boys (40.0%), with a statistically significant difference indicated by the Chi-square test ($\chi^2 = 7.454$, $p = 0.024$). For Level 3, a larger percentage of girls (71.4%) were found, compared to boys (28.6%). For Level 4, the majority of participants were boys (75.0%), while only 25.0% were girls. The significant p-value (<0.05) for Level 2 suggests a notable gender difference in the distribution of motor function levels among children with cerebral palsy.

CHAPTER: V DISCUSSION & LIMITATIONS

The study's findings provide important new information on the sociodemographic traits and dysphagia-related problems of children with cerebral palsy (CP), such as their motor function levels, feeding challenges, and satisfaction with dysphagia care. These results show both areas of agreement and disagreement with previous studies on dysphagia and cerebral palsy, and in some situations, they also conflict with it.

With 78% of participants reporting eating issues, one of the study's main conclusions is the significant incidence of swallowing difficulties. Swallowing solid meals was the most often reported problem (32%), followed by soft foods and liquids (22% each). This result is in line with earlier research that highlights how common swallowing difficulties are among kids with cerebral palsy, especially when it comes to solid meals. For instance, according to Calderone et al. (2025), food texture is a significant contributing factor to swallowing problems in up to 85% of children with cerebral palsy (CP) (Calderone et al. 2025, p. 57). In a similar vein, Dutra et al. (2019) observed that a major problem for kids with cerebral palsy was their inability to swallow complex food textures, such as solids (Dutra et al. 2019, p. 5519). The results of this research highlight how crucial it is to address issues with food texture when managing dysphagia in kids with cerebral palsy.

The research also discovered a gender difference in the distribution of GMFCS levels in relation to motor function, with more males at Level 4 and more girls at greater degrees of impairment (Levels 2 and 3). The GMFCS levels of boys and girls differed statistically significantly ($\chi^2 = 7.454$, $p = 0.024$), according to the Chi-square test, with females exhibiting more severe deficits. Gender disparities in the severity of motor impairments were noted by Dutra et al. (2019), and this result is consistent with their results. This suggests that females with cerebral palsy may have more severe motor dysfunction (Dutra et al. 2019, p. 5519). The substantial p-value suggests that gender could have a major role in determining how motor deficits are distributed among children with cerebral palsy. This might help to explain why girls have more difficulty swallowing and eating than boys.

According to 52% of research participants, they were not happy with how their swallowing issues were being managed, indicating glaring gaps in the effectiveness of therapy. This finding is comparable to that of Speyer et al. (2019), who also noted that CP populations were dissatisfied with the treatment they received for dysphagia (Speyer et al. 2019, p. 1249). The fact that 52% of parents expressed dissatisfaction suggests that although dysphagia management measures are in place, they may not be enough to meet the requirements of children with cerebral palsy, particularly given the range of eating issues these kids face. Given that discontent is still common, the study's findings suggest that dysphagia treatment requires improved care and more specialized, targeted techniques.

An additional component to managing dysphagia in children with cerebral palsy is added by the study's discovery of gender variance in the distribution of GMFCS levels, with girls more often categorized at higher impairment levels (Levels 2 and 3) and boys more likely to be classified at Level 4. This finding contradicts some other research that found a less pronounced gender difference. It also has ramifications for arguments about why females with cerebral palsy have more motor disability than boys. Other studies have also identified sex variations in CP, albeit it's unclear what exactly causes these variances. Theories to explain these discrepancies include differences in early developmental trajectories, hormonal influences, and biological and genetic factors (Dutra et al., p. 5519).

As they suffer, girls may consume more. For instance, children with CP have more severe dysphagia the higher their GMFCS score, which indicates more severe motor impairment. Chewing and bolus manipulation may be challenging for children with higher GMFCS levels due to their poor synchronization of basic oral and pharyngeal motor patterns required for swallowing (Berg et al. 2020, p. 310). As a result, children at this ages may have more eating issues since they deal with two challenges at mealtimes.

The use of more aggressive and extensive therapies, such postural assistance during meals, texture-modified foods, and oral-motor therapy, may be guided by motor deficits. In order to inform care strategies for both boys and girls with cerebral palsy, future studies should look into the causes of these gender disparities in motor function and eating issues.

One important finding from this research is that 52% of individuals expressed dissatisfaction with the way they were treated for their swallowing disorder. This criticism highlights the need of enhancing current treatment strategies for children with cerebral palsy who have dysphagia. Even if therapies like speech and language therapy, postural adjustments, or texture-modified foods have been shown to be successful in managing FDs (Speyer et al. 2019, p. 1249), it's possible that the methods being used now aren't being sufficiently tailored to a specific kid with problems. A more individualized, all-encompassing strategy is necessary since the present treatment guidelines are unable to account for the great diversity in feeding problems.

A number of reasons might be responsible for the participants' discontent. First, dysphagia in children with cerebral palsy is often complex, including sensory, cognitive, and behavioral problems in addition to motor disorders (Rosenbaum et al. 2017, p. 55). A multidisciplinary and coordinated strategy is required to treat these variables together, yet clinical practice does not always fully use this approach. Additionally, since dysphagia treatment may be challenging, particularly for children with severe motor impairments, parents and children may get frustrated when therapies don't produce positive results. 45.3% of participants in this research had poor swallowing skills, and the fact that more than 50% of them were dissatisfied with their dysphagia therapy may point to a communication breakdown between families and medical staff. These caregivers may feel hopeless and powerless because they are not receiving enough assistance or training to deal with their child's eating issue (Dirks et al. 2016, p. 102).

The study's sociodemographic data also offered some helpful insights into the factors that influence dysphagia treatment. According to Dirks et al. (2016), who observed that family inclusion and caregiver education had a significant impact on the success of rehabilitation in children with disabilities, it appears that children from nuclear families and those with educated guardians had better management outcomes (Dirks et al. 2016, p. 102). Educated caregivers are more likely to comprehend dysphagia treatment and adhere to recommended practices. This study emphasizes the importance of family members in helping children with cerebral palsy with their dysphagia.

Lastly, this study confirms that dysphagia is still a common and significant issue for kids with cerebral palsy when they move on to more difficult food textures like solid meals. " Response: The gender-specific differences in the distribution of motor function levels and satisfaction with dysphagia therapy underscore the complexity of managing these conditions. The findings suggest that improved, tailored interventions are needed for a variety of eating issues, gender differences, and the financial standing of children with cerebral palsy. To improve the quality of life for kids with cerebral palsy, future research should be more interdisciplinary and concentrate more on managing the nutritional and motor elements of dysphagia.

Limitations

Sampling The study: sample was small with only 50 participants; the findings may not generalise to children with cerebral palsy more widely.

Cross-Sectional Design The study's design captures data at a single point in time, preventing assessment of changes in feeding ability or motor function over time.

Single-Center Recruitment Participants were likely recruited from one or a few local centers, which may not represent the diversity of children with CP in other regions.

Limited Sociodemographic Diversity The sample was predominantly from nuclear families and a single religious majority, reducing the ability to explore cultural or family-structure influences on outcomes.

Potential Reporting Bias Data on feeding difficulties and dysphagia management satisfaction relied on caregiver reports, which may be subjective and influenced by personal perceptions.

Lack of Longitudinal Follow-Up Functional outcomes such as GMFCS and EDACS classifications were measured once, limiting understanding of developmental progress or response to interventions.

Gender Imbalance Although not statistically significant, the slightly higher proportion of girls (58%) may affect comparisons between genders.

Limited Assessment of Comorbidities The study did not account for other medical conditions (e.g., epilepsy, respiratory issues) that could influence feeding and motor function.

Restricted Geographic Representation The findings may not apply to rural or underrepresented populations, where access to healthcare and feeding interventions may differ.

CHAPTER: VI CONCLUSION & RECOMMENDATION

This study highlights the high prevalence of dysphagia and feeding difficulties in children with cerebral palsy (CP), particularly in relation to solid foods. Solid foods were mentioned to be the most problematic among the participants, which is in line with previous findings that highlight issues of food texture for this child age group. Additionally, significant rates of certain types of feeding dysfunction, such as prolonged mealtimes, coughing and difficulty with swallow (including various foods) were reported for many children in the study, highlighting the intricate nature of dysphagia treatment within this population. These results highlight the importance of interventions specifically targeting these challenges. Dysphagia is an important disabling condition for children with CP that can result in malnutrition and dehydration, as well as respiratory problems due to aspiration. The effect on the quality of life of both, the child and caregiving persons is remarkable because these patients deserve multidisciplinary, personalized care.

The study also found variation by sex for distribution of GMFCS levels, in addition to feeding problems. In particular, severity for motor impairments was higher in girls compared to boys due to the greater percentage of girls who fell into GMFCS levels 2 and 3. The characterization of being a girl, which is overwhelmingly underrepresented in CP populations with lower GMFCS levels2 and has implications for several health-related outcomes, especially when considering the care demands, intensity and complexity of caring for children with severe motor impairment. These sex differences should be explored further to develop sex-specific treatment guidelines for issues such as dysphagia and motor function in CP patients. Girls may also have more severe motor impairments, and hence oral-motor control may be worse, leading to increased problems in feeding. This finding suggests that more attention should be paid to gender-specific motor function and dysphagia in CP.

Furthermore, the study found a high level of dissatisfaction in managing dysphagia (52% were not satisfied). This dissatisfaction indicates a serious deficiency in the current CP care and support services for children. While there are current interventions, many children continue to have difficulties with feeding and perhaps our existing tools do not fully capture the range of challenges present in these children. Such dissatisfaction gap means that a more efficient and personalized interdisciplinary intervention for CP children is urgent. This

approach should facilitate liaisons between pediatricians, speech-language pathologists, dietitians and occupational therapists to offer a more comprehensive management of dysphagia.

The results also underscore the value of family participation and caregiver education in achieving better dysphagia management. Knowledge and support of the caregiver is key to successful dysphagia interventions. Caregivers with knowledge are better able to use feeding techniques and thus have better nutritional results with less feeding related morbidity. Since dysphagia is a multifaceted problem and needs continual support, it’s important to engage the family in care for long-term effectiveness.

In short, the overall results of the study highlight the importance of new research and development of more precise diagnostic apparatus and intervention strategies that better target feeding problems and nutritional obstacles faced by children with CP. Centering on these themes will aid in enhancing quality of life and long-term health outcomes for children with CP, while reducing family burden and advancing healthcare.

Recommendations

Individualized Intervention Plans: The evidence-based intervention program should be tailored to specific motor and feeding issues in children with CP rather than symptom clusters, and general information for all children (e.g., gender).

Improved Caregiver Education: Deliver specific training and instructional tools to caregivers, in particular those with lower levels of education, to increase knowledge on management of dysphagia, nutrition and motor support.

Multidisciplinary Intervention: Facilitate the cooperation of physiotherapists, speech therapists, dietitians and occupational therapists to provide holistic care for the alleviation of motor symptoms as well as feeding requirements.

Regular monitoring of feeding and motor function: Systematic evaluations with standardized tools such as EDACS and GMFCS for regular follow-up, catch issues early, and adapt interventions

Increase access to nutrition support: Expand access to feeding aids, tube feeding and nutritional supplement for children at risk of malnutrition due to severe dysphagia and continue to support caregivers in use and monitoring**.**

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APPENDIX

মৌখিক সম্মতি পত্র

আসসালামু আলাইকুম/ নমস্কার, আমি ফারজানা জাহান, বি এস সি ইন ফিজিওথেরাপির ছাত্রী, সাইক কলেজ অব মেডিকেল সাইন্স এন্ড টেকনোলজি যা ঢাকা বিশ্ববিদ্যালিয়ের মেডিসিন অনুষদের অন্তর্ভুক্ত। আমার স্নাতক ডিগ্রীর আংশিক পরিপূর্নতার জন্য আমাকে একটি গবেষণা প্রকল্প পরিচালনা করতে হবে এবং এটি আমার অধ্যায়নের একটি অংশ । আমার গবেষণার শিরনাম "**ঢাকা শহরের সেরিব্রাল পলসিতে আক্রান্ত শিশুদের মধ্যে ডিসফ্যাজিয়ার বৈশিষ্ট্য** "

আমি আশা করি যে সাক্ষাত্কারটি ২০-৩০ মিনিট সময় নেবে। আমি আরও প্রস্তাব দিচ্ছি যে,যখন কোন প্রশ্ন গোপনীয় মনে হবে তা আমাকে জানাবেন ।

আমি আপনাকে জানাতে চাই যে এটি একটি সম্পূর্ণরূপে একাডেমিক অধ্যয়নের জন্য এবং অন্য কোন উদ্দেশ্যে ব্যবহার করা হবে না। আমি আপনাকে আশ্বাস দিচ্ছি যে সমস্ত তথ্য গোপন রাখা হবে। আপনার অংশগ্রহণ স্বেচ্ছায় হবে। আপনার সম্মতি প্রত্যাহার করার এবং যেকোনো সময় অধ্যয়ন বন্ধ করার অধিকার থাকবে ।এই প্রশ্নাবলী সম্পর্কে আপনার অপছন্দের অন্য কোনো প্রশ্নের উত্তর না দেওয়ার অধিকারও আপনার আছে।

অধ্যয়ন সম্পর্কে আপনার কোন প্রশ্ন থাকলে, আপনি আমার সাথে (০১৯৩১৪৮৫৩৫৯) অথবা আমার সুপারভাইজার জনাব ডা. শহিদ আফ্রিদী (পিটি) (০১৭৮০০০৬৪৪১) প্রভাষক (ফিজিওথেরাপি) এর সাথে সাথে যোগাযোগ করতে পারেন ।

তাহলে, ইন্টারভিউ নিয়ে এগিয়ে যেতে আমি কি আপনার সম্মতি পেতে পারি? হ্যাঁ........না.........

অংশগ্রহণকারীর স্বাক্ষর এবং তারিখ.........................

গবেষকের স্বাক্ষর এবং তারিখ ....

সাক্ষীর স্বাক্ষর ও তারিখ..........................

গবেষণা প্রশ্নাবলী

“ঢাকা শহরের সেরিব্রাল পলসিতে আক্রান্ত শিশুদের মধ্যে ডিসফ্যাজিয়ার বৈশিষ্ট্য”

পার্ট-1: ব্যক্তিগত তথ্য

প্রশ্ন নং	প্রশ্ন	উত্তর
১.১	রোগীর নাম:	…………………………………………………………………….
১২	রোগীর আইডি নম্বর:	…………………………………………………………………….
১৩	সাক্ষাৎকারের তারিখ:	…………………………………………………………………….
১৪	ঠিকানা:	গ্রাম: …………………………………………………………………….... ডাকঘর: …………………………………………………………........... উপজেলা: …………………………………………………………………….. জেলা: ……………………………………………………………………..

পার্ট-2: রোগীর সামাজিক তথ্যাবলি

প্রশ্ন নং	প্রশ্ন	উত্তর
২.১	রোগীর বয়স	……………………………………………………………………….
২.২	রোগীর লিঙ্গ	……………………………………………………………………….
২.৩	ভাইবোন	……………………………………………………………………….
২.৪	পরিচর্যাকারীর নাম:	……………………………………………………………………….
২.৫	পরিচর্যাকারীর মোবাইল নম্বর:	……………………………………………………………………….

২.৬	পরিচর্যাকারীর শিক্ষা	১ = নিরক্ষর ২ = প্রাথমিক ৩ = মাধ্যমিক ৪ = উচ্চমাধ্যমিক ৫ = স্নাতক ৬ = স্নাতকোত্তর
২.৭	ধর্ম	১ = ইসলাম ২ = হিন্দু ৩ = অন্যান্য
২.৮	বসবাসের এলাকা	১ = গ্রামীণ ২ = আধা শহর ৩ = শহুরে
২.৯	পারিবারিক ধরন	১ = একক ২ = বর্ধিত
২.১০	পারিবারিক আয়	…………………..…………………………………...............

পার্ট-৩: চিকিৎসা সংক্রান্ত তথ্য

প্রশ্ন নং	প্রশ্ন	উত্তর
৩.১	উচ্চতা	……………………………ফুট………………………....ইঞ্চি
৩.২	ওজন	………………..…………..………………………………..কেজি
৩.৩	বিএমআই	…………………………………………..…………………………
৩.৪	সেরিব্রাল পলসীর ধরন কী?	১ = স্পাস্টিক ২ = ডিস্কাইনেটিক ৩ = অ্যাটাক্সিক ৪ = মিশ্র
৩.৫	পূর্বে কি ডিসফ্যাজিয়া মূল্যায়ন বা চিকিৎসা করেছেন?	যদি হ্যাঁ, নির্দিষ্ট করুণ ………………………………………………………………………….
৩.৬	আপনার সন্তানের খাওয়ার সময় কোন বিশেষ সমস্যা লক্ষ্য করেছেন?	১ = খাবার গিলতে অসুবিধা ২ =খাবার মুখে ধরা ৩ = খাবার গিলতে সময় লেগে যাওয়া ৪ = খাবার মুখে রেখে কাশি ৫ = খাবার মুখে রাখতে না পারা ৬ = অন্যান্য

৩.৭	আপনার সন্তান সাধারণত কোন ধরনের খাদ্য খেতে পারে?	১ = তরল খাবার (যেমন দুধ, স্যুপ) ২ = নরম খাবার (যেমন পিউরি, রান্না করা সবজি) ৩ = কঠিন খাবার (যেমন রুটি, চাল) ৪ = অন্যান্য
৩.৮	আপনার সন্তানের খাদ্য খাওয়ার সময় কোন বিশেষ খাবারের ক্ষেত্রে সমস্যা হয় কি?	১ = তরল খাবার ২ = নরম খাবার ৩ = কঠিন খাবার ৪ = কোনো সমস্যাই নাই
৩.৯	খাবার শেষ করতে কত সময় লাগে?	…………………………………………………………………………
৩.১০	খাবার খাওয়ানোর সময় কি ফিডিং টিউব ব্যবহার করতে হয়?	১ = হ্যাঁ ২= না
৩.১১	কোন পুষ্টি সম্পূরক ব্যবহার করা হয় কি?	১ = হ্যাঁ ২= না
৩.১২	ডিসফ্যাজিয়া ব্যবস্থাপনায়	১ = খুব ভালো

	আপনার সন্তুষ্টি কেমন?	২ = মোটামুটি ভালো ৩ = ভালো নয়

<u>গ্রস মোটর ফাংশন ক্লাসিফিকেশন সিস্টেম (GMFCS)</u>

৪.১। ২ থেকে ৪ বছর বয়সের মধ্যে:

- লেভেল ১:
  • শিশু মেঝেতে বসে থাকতে পারে এবং বসে বসে বসে বসে বসে কাজ করতে পারে।
  • শিশু চলতে সক্ষম, এবং কোনো সহায়তার প্রয়োজন নেই।
- লেভেল ২:
  • শিশু বসতে পারে, কিন্তু দুই হাতের মাধ্যমে বসে থাকতে সমস্যা হতে পারে।
  • শিশু চলতে সক্ষম তবে একটু সহায়তা প্রয়োজন।
- লেভেল ৩:
  • শিশু মেঝেতে বসে থাকতে পারলেও সাহায্যের প্রয়োজন।
  • শিশু ক্রল করে চলতে পারবে, কিন্তু খালি হাঁটতে পারবে না।
- লেভেল ৪:
  • শিশু বসতে পারলেও হাতের সাহায্য প্রয়োজন।
  • শিশু শরীরের ধাক্কা দিয়ে চলতে পারে।
- লেভেল ৫:
  • শারীরিক প্রতিবন্ধকতা বেশি, কোনো সহায়তা ছাড়া চলতে পারেনা।

৪.২। ৪ থেকে ৬ বছর বয়সের মধ্যে:

- লেভেল ১:
  • শিশু নিজে চেয়ার থেকে উঠে দাঁড়াতে পারে এবং চলতে পারে।
  • শিশু স্টেপ উঠে যায় এবং ছোট দৌড়াতেও পারে।

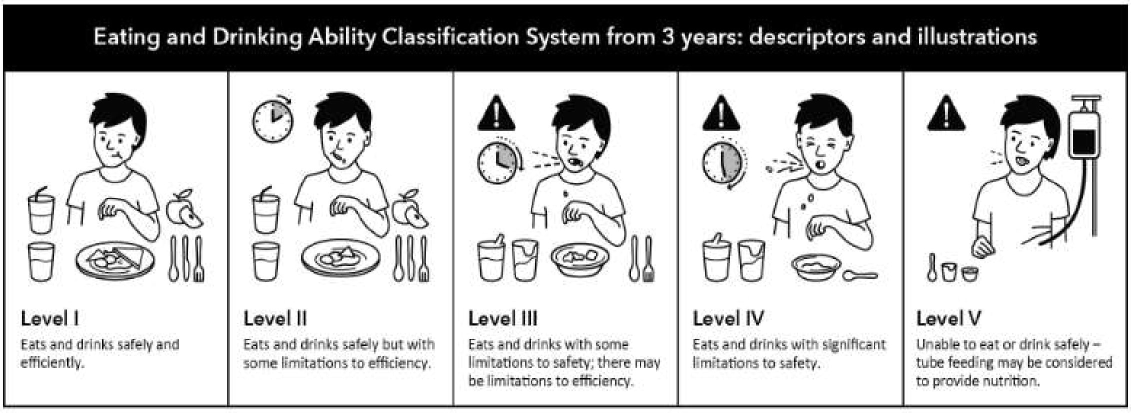
- লেভেল ২:
  - শিশু চেয়ার থেকে উঠতে পারলেও সহায়তার প্রয়োজন হতে পারে।
  - শিশু চলতে এবং উঠতে সাহায্য নেয়ার প্রয়োজন।
- লেভেল ৩:
  - শিশু হাঁটতে সহায়তা নিলেও চলতে সক্ষম।
  - শিশু স্টেপে উঠতে পারেন।
- লেভেল ৪:
  - শিশু সিলিং সহায়তার মাধ্যমে স্টেপে উঠতে সক্ষম।
- লেভেল ৫:
  - শারীরিক প্রতিবন্ধকতা বেশি, সহায়তা ছাড়া চলতে পারবেন না।

৪.৩। ৬ থেকে ১২ বছর বয়সের মধ্যে:

- লেভেল ১:
  - শিশু চলতে এবং স্টেপে উঠতে সক্ষম।
  - শিশু দ্রুত দৌড়াতে এবং লাফাতে সক্ষম।
- লেভেল ২:
  - শিশু চলতে এবং ছোট স্টেপে উঠতে সক্ষম।
  - তবে কিছু ক্ষেত্রে খোলা জায়গায় চলতে সমস্যা হতে পারে।
- লেভেল ৩:
  - শিশু হাঁটতে এবং চেয়ারে বসে চলতে সক্ষম।
- লেভেল ৪:
  - শিশু পাওয়ার হুইলচেয়ারে চলতে সক্ষম।
- লেভেল ৫:
  - শারীরিক প্রতিবন্ধকতা অধিক, আর কোনো সহায়তা ছাড়া চলতে সক্ষম না।

খাওয়া এবং পানীয় ক্ষমতা শ্রেণীবিভাগ সিস্টেম (EDACS)ঃ

স্তর ১	নিরাপদভাবে এবং দক্ষতার সাথে খায় এবং পান করে
স্তর ২	নিরাপদভাবে খায় এবং পান করে কিন্তু কিছু সীমাবদ্ধতা সহ
স্তর ৩	নিরাপত্তায় কিছু সীমাবদ্ধতা সহ খায় এবং পান করে; দক্ষতায় কিছু সীমাবদ্ধতা থাকতে পারে
স্তর ৪	নিরাপত্তায় গুরুত্বপূর্ণ সীমাবদ্ধতা সহ খায় এবং পান করে
স্তর ৫	নিরাপদভাবে খেতে বা পান করতে অক্ষম - পুষ্টির জন্য টিউব ফিডিং বিবেচনা করা হতে পারে



Sellers, D., Mandy, A., Pennington, L., Hankins, M. and Morris, C. (2014), Development and reliability of a system to classify the eating and drinking ability of people with cerebral palsy. Dev Med Child Neurol, 56: 245-251. https://doi.org/10.1111/dmcn.12352

Illustrations © Jane Coffey

Verbal Consent Form

Assalamuaalaikum/ Namashkar,I am Farjana Jahan, a student of B.Sc. in Physiotherapy, SAIC College of Medical Science and Technology (SCMST), affiliated with the Faculty of Medicine, University of Dhaka. For the partial fulfillment of my bachelor's degree, I have to conduct a research project and it is a part of my study. My Research title is **“Characteristics of dysphagia among the children with cerebral palsy in Dhaka city”**

I do expect that the interview will take 20-30 minutes. I also offer to ask any questions when you feel it is necessary to get insight.

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

If you have any queries about the study, you may contact me (01931485359) or my supervisor Mr. Dr. Shahid Afridi (PT) (01780006441), Lecturer (Physiotherapy) of SCMST.

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

Yes……. No………

Signature of the participant & Date…………………………….

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

Signature of the witness & Date………………………………

Research Questionnaire

"Characteristics of Dysphagia among the Children with Cerebral Palsy in Dhaka City"

Part-1:Personal Information

Question No.	**Question**	**Answer**
1.1	Patients name:	………………………………………..
1.2	Patients ID No:	……………………………………….
1.3	Date of interview:	…………………………………………
1.4	Address:	Village: Post office: Upazila: District:

Part-2:Sociodemographic Information

Question No.	**Question**	**Answer**

2.1	Patient’s age	…………………………………………
2.2	Patient’s gender	…………………………………………
2.3	Siblings	…………………………………………
2.4	Attendent’s Name:	…………………………………………
2.5	Attendent’s mobile no:	…………………………………………
2.6	Education of the care guardian	1 = Illiterate 2 = Primary 3 = SSC 4 = HSC 5 = Graduation
2.7	Religion	1 = Islam 2 = Hindu 3 = Others
2.8	Living area	1 = Rural 2 = Semi town 3 = Urban

2.9	Family type	1 = Nuclear 2 = Extended
2.10	Family income (in BDT)	…………………………………………

Part-3:Medical Information

Question No.	**Question**	**Answer**
3.1	Height	…………… feet……………..inches
3.2	Weight	……………………………………kg
3.3	BMI	……………………………………..
3.4	Types of CP	1 = Spastic 2 = Dyskinetic 3 = Ataxic 4 = Mixed
3.5	Previous dysphagia assessment or intervention	If yes, specify: ………………………………………. ……………………………………….
3.6	Particular problems while eating	1 = Difficulty swallowing food

		2 = Caught in the mouth 3 = Taking time to swallow food 4 = Cough with food in mouth 5 = Not being able to keep food in the mouth 6 = other
3.7	Type of Food	1 = Liquid foods (eg milk, soup) 2 = Soft foods (eg purees, cooked vegetables) 3 = Solid foods (eg bread, rice) 4 = Others
3.8	Trouble eating any particular foods	1 = Liquid food 2 = Soft food 3 = solid food 4 = No problem at all
3.9	Time taken to complete a meal	…………………………………………………
3.10	Use a feeding tube while feeding	1 = Yes 2 = No

3.11	Use of supplemental nutrition	1 = Yes 2 = No
3.12	Satisfaction with dysphagia management	1 = Good 2 = Poor 3 = Fair

GMFCS

4.1. Between Birthday 2nd and 4th	o Level 1 • Children floor sit with both hands-free to manipulate objects. • Movements in and out of floor sitting and standing are performed without adult assistance. • Children walk as the preferred method of mobility without the need for any assistive mobility device.
	o Level 2 • Children floor sit but may have difficulty with balance when both hands are free to manipulate objects. • Movements in and out of sitting are performed without adult assistance. • Children pull to stand on a stable surface. • Children crawl on hands and knees with a reciprocal pattern, cruise holding onto furniture and walk using an assistive mobility device as preferred methods of mobility.

	o Level 3 • Children maintain floor sitting often by "W sitting" (sitting between flexed and internally rotated hips and knees) and may require adult assistance to assume sitting. • Children creep on their stomach or crawl on hands and knees (often without reciprocal leg movements) as their primary methods of self mobility. • Children may pull to stand on a stable surface and cruise short distances. • Children may walk short distances indoors using an assistive mobility device and adult assistance for steering and turning.

	o Level 4 • Children floor sit when placed, but are unable to maintain alignment and balance without use of their hands for support. • Children frequently require adaptive equipment for sitting and standing. • Self mobility for short distances (within a room) is achieved through rolling, creeping on stomach, or crawling on hands and knees without reciprocal leg movement.

	o Level 5 • Physical impairments restrict voluntary control of movement and the ability to maintain antigravity head and trunk postures. All areas of motor function are limited. • Functional limitations in sitting and standing are not fully compensated for through the use of adaptive equipment and assistive technology. • At Level V, children have no means of independent mobility and are transported. • Some children achieve self-mobility using a power wheelchair with extensive adaptations.
4.2. Between 4th and 6th Birthday (If patients age range is 4-6, skip Ques. No,4.1)	o Level 1 • Children get into and out of, and sit in, a chair without the need for hand support. • Children move from the floor and from chair sitting to standing without the need for objects for support. • Children walk indoors and outdoors, and climb stairs. • Emerging ability to run and jump.

	o Level 2 - Children sit in a chair with both hands free to manipulate objects. - Children move from the floor to standing and from chair sitting to standing but often require a stable surface to push or pull up on with their arms. - Children walk without the need for any assistive mobility device indoors and for short distances on level surfaces outdoors. - Children climb stairs holding onto a railing but are unable to run or jump.
	o Level 3 - Children sit on a regular chair but may require pelvic or trunk support to maximize hand function. - Children move in and out of chair sitting using a stable surface to push on or pull up with their arms. - Children walk with an assistive mobility device on level surfaces and climb stairs with assistance from an adult. - Children frequently are transported when travelling for long distances or outdoors on uneven terrain.

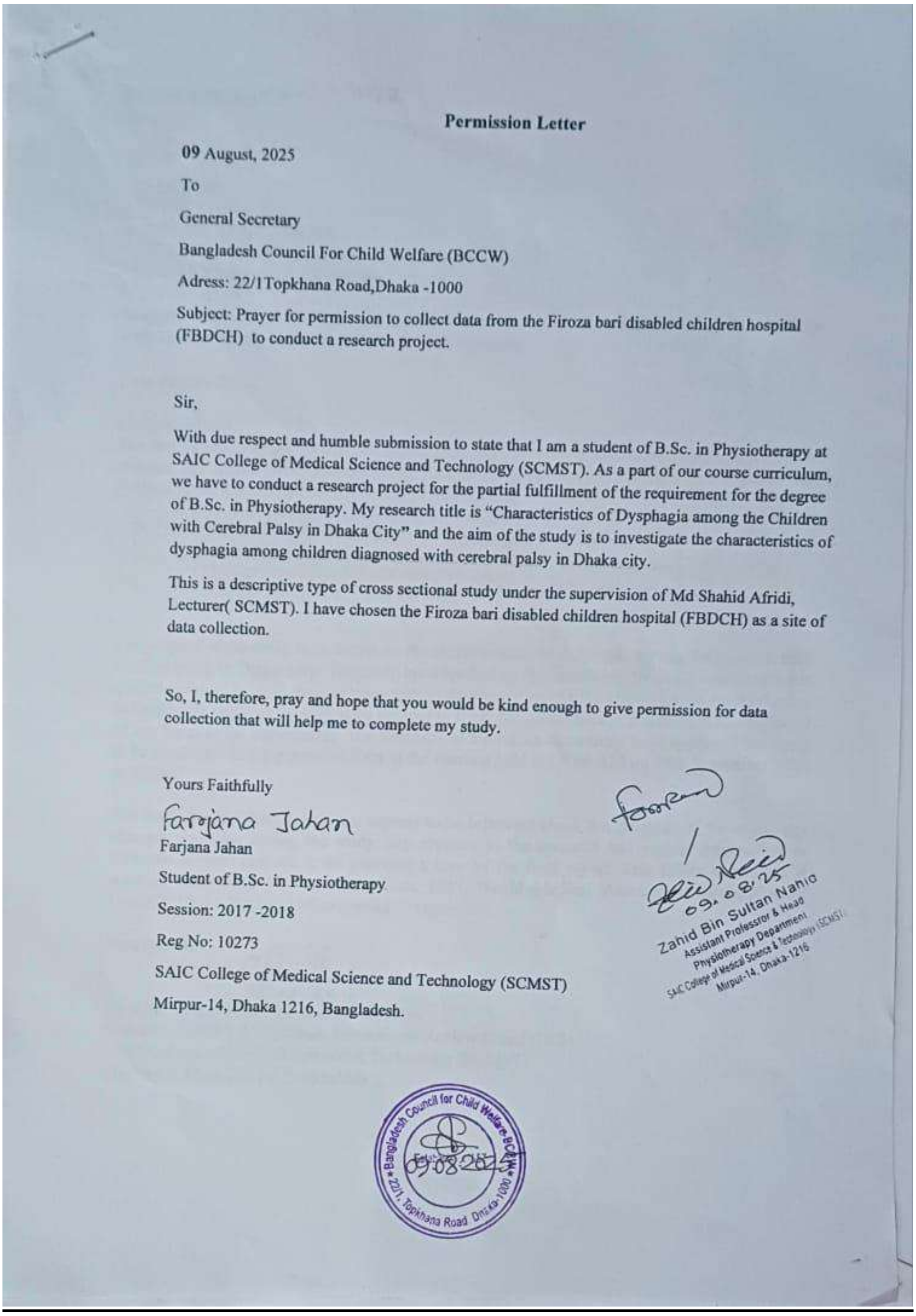
	o Level 4 • Children sit on a chair but need adaptive seating for trunk control and to maximize hand function. • Children move in and out of chair sitting with assistance from an adult or a stable surface to push or pull up on with their arms. • Children may at best walk short distances with a walker and adult supervision but have difficulty turning and maintaining balance on uneven surfaces.
	• Children are transported in the community. Children may achieve self-mobility using a power wheelchair.
	o Level 5 • Physical impairments restrict voluntary control of movement and the ability to maintain antigravity head and trunk postures. • All areas of motor function are limited. Functional limitations in sitting and standing are not fully compensated for through the use of adaptive equipment and assistive technology • At Level V, children have no means of independent mobility and are transported. • Some children achieve self-mobility using a power wheelchair with extensive adaptations.

4.3. Between 6th and 12th Birthday (If patients age range is 6-12, skip Ques. No,4.3)	o Level 1 • Children walk indoors and outdoors and climb stairs without limitations. • Children perform gross motor skills including running and jumping but speed, balance, and coordination are reduced.
	o Level 2 • Children walk indoors and outdoors, and climb stairs holding onto a railing but experience limitations walking on uneven surfaces and inclines, and walking in crowds or confined spaces. • Children have at best only minimal ability to perform gross motor skills such as running and jumping.
	o Level 3 • Children walk indoors or outdoors on a level surface with an assistive mobility device. • Children may climb stairs holding onto a railing. • Depending on upper limb function, children propel a wheelchair manually or are transported when travelling for long distances or outdoors on uneven terrain.
	o Level 4 • Children may maintain levels of function achieved before age 6 or rely more on wheeled mobility at home, school, and in the community. • Children may achieve self-mobility using a power wheelchair.

	o Level 5 • Physical impairments restrict voluntary control of movement and the ability to maintain antigravity head and trunk postures. • All areas of motor function are limited. Functional limitations in sitting and standing are not fully compensated for through the use of adaptive equipment and assistive technology. • At level V, children have no means of independent mobility and are transported. • Some children achieve self-mobility using a power wheelchair with extensive adaptations.

Eating and Drinking Ability Classification System (EDACS)

Level 1	Eats and drink safely with efficiency
Level 2	Eats and drinks safely but with some limitations to efficiency
Level 3	Eats and drinks with some limitations to safety; there may be limitations to efficiency
Level 4	Eats and drinks with significant limitations to safety
Level 5	Unable to eat or drink safely - tube feeding may be considered to provide nutrition



Permission Letter

09 August, 2025

To

General Secretary

Bangladesh Council For Child Welfare (BCCW)

Adress: 22/1Topkhana Road,Dhaka -1000

Subject: Prayer for permission to collect data from the Firoza bari disabled children hospital (FBDCH) to conduct a research project.

Sir,

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

This is a descriptive type of cross sectional study under the supervision of Md Shahid Afridi, Lecturer(SCMST). I have chosen the Firoza bari disabled children hospital (FBDCH) as a site of data collection.

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

Yours Faithfully

Farjana Jahan

Farjana Jahan

Student of B.Sc. in Physiotherapy

Session: 2017 -2018

Reg No: 10273

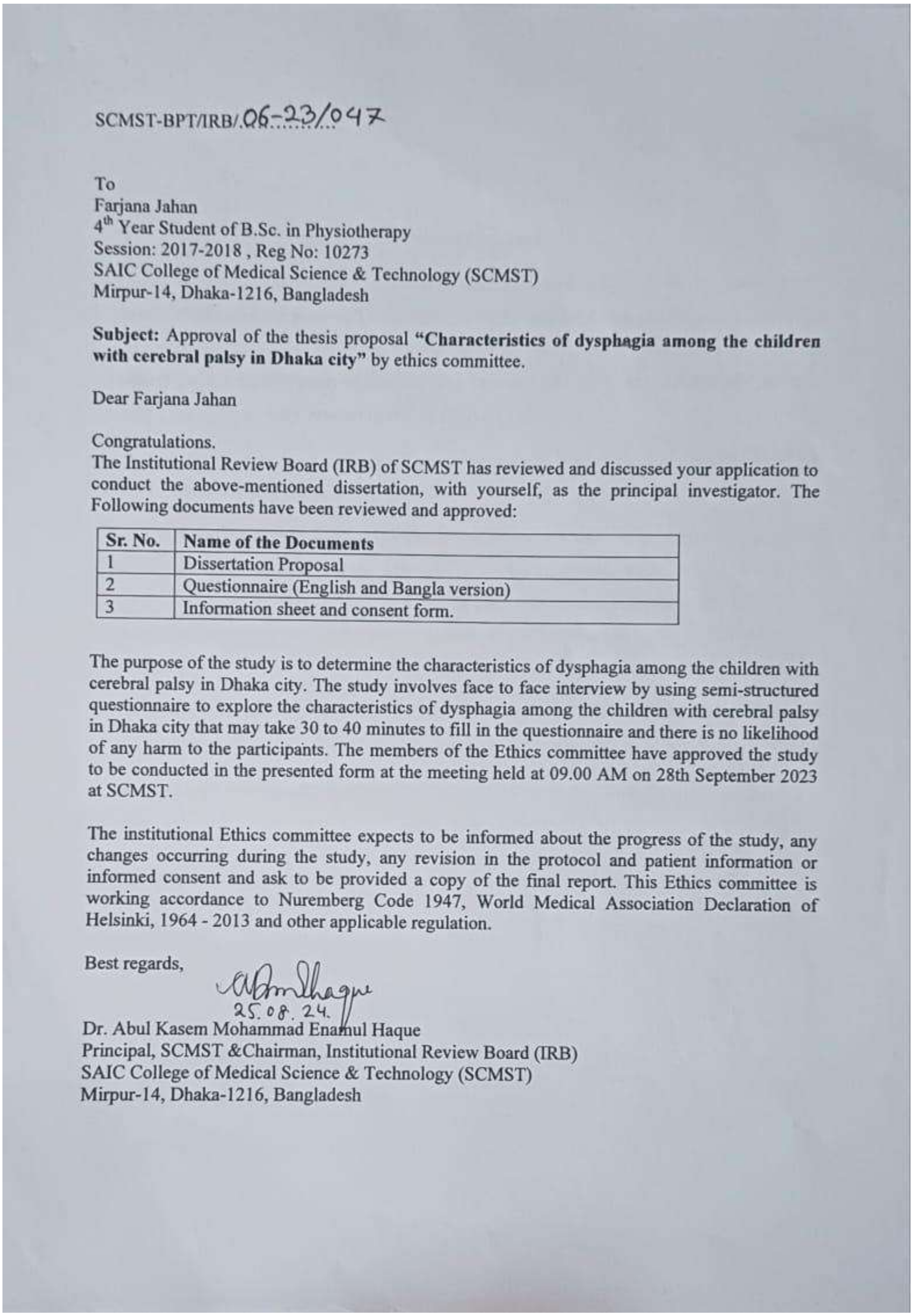
SAIC College of Medical Science and Technology (SCMST)

Mirpur-14, Dhaka 1216, Bangladesh.

09.08.25

Zahid Bin Sultan Nahid
Assistant Professor & Head
Physiotherapy Department
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216

09.08.2025



SCMST-BPT/IRB/.06-23/047

To
Farjana Jahan
4th Year Student of B.Sc. in Physiotherapy
Session: 2017-2018 , Reg No: 10273
SAIC College of Medical Science & Technology (SCMST)
Mirpur-14, Dhaka-1216, Bangladesh

Subject: Approval of the thesis proposal **"Characteristics of dysphagia among the children with cerebral palsy in Dhaka city"** by ethics committee.

Dear Farjana Jahan

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	Dissertation Proposal
2	Questionnaire (English and Bangla version)
3	Information sheet and consent form.

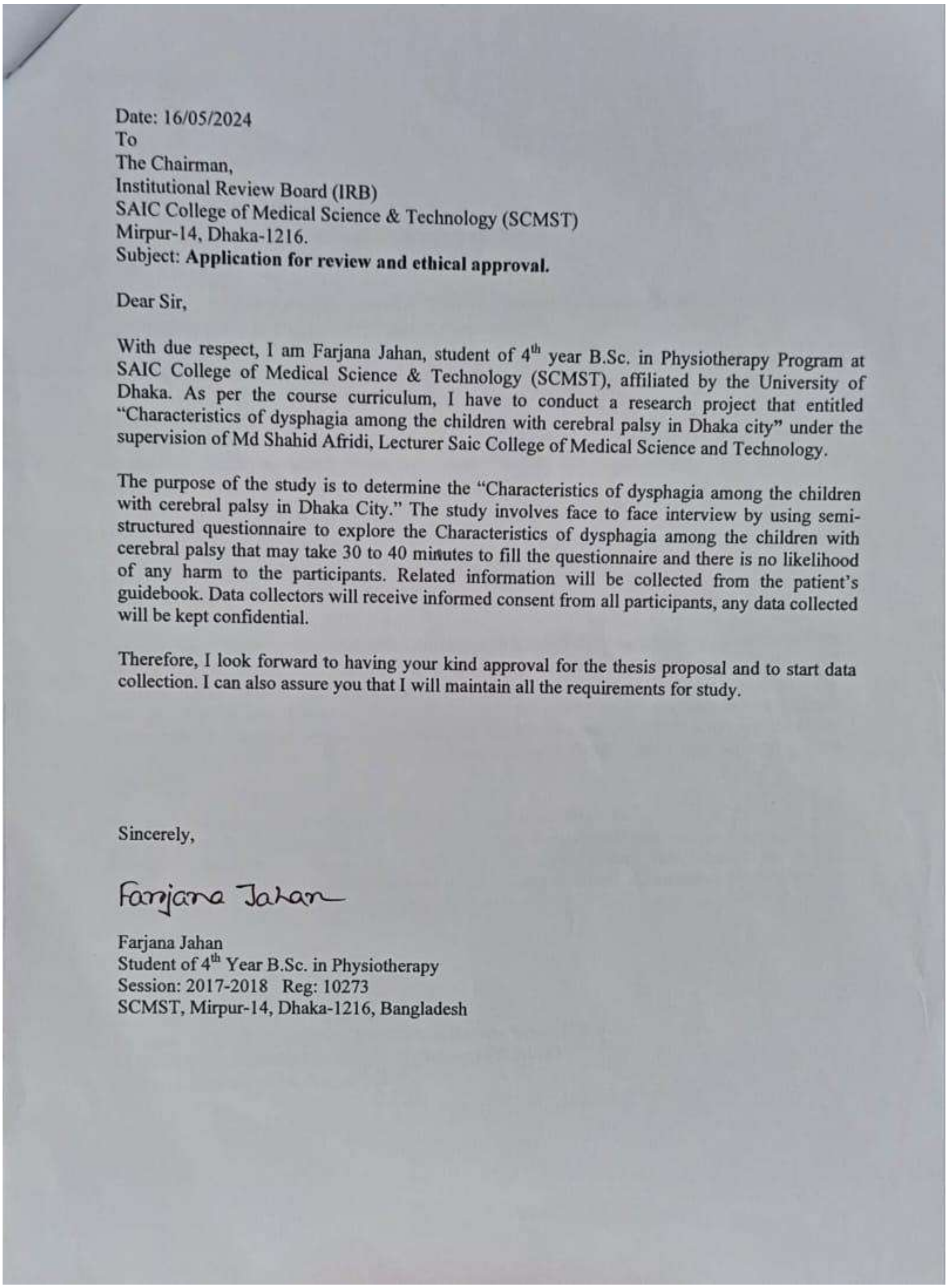
The purpose of the study is to determine the characteristics of dysphagia among the children with cerebral palsy in Dhaka city. The study involves face to face interview by using semi-structured questionnaire to explore the characteristics of dysphagia among the children with cerebral palsy in Dhaka city that may take 30 to 40 minutes to fill in the questionnaire and there is no likelihood of any harm to the participants. The members of the Ethics committee have approved the study to be conducted in the presented form at the meeting held at 09.00 AM on 28th September 2023 at SCMST.

The institutional Ethics committee expects to be informed about the progress of the study, any changes occurring during the study, any revision in the protocol and patient information or informed consent and ask to be provided a copy of the final report. This Ethics committee is working accordance to Nuremberg Code 1947, World Medical Association Declaration of Helsinki, 1964 - 2013 and other applicable regulation.

Best regards,

25.08.24.

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



Date: 16/05/2024
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 Farjana Jahan, 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 "Characteristics of dysphagia among the children with cerebral palsy in Dhaka city" under the supervision of Md Shahid Afridi, Lecturer Saic College of Medical Science and Technology.

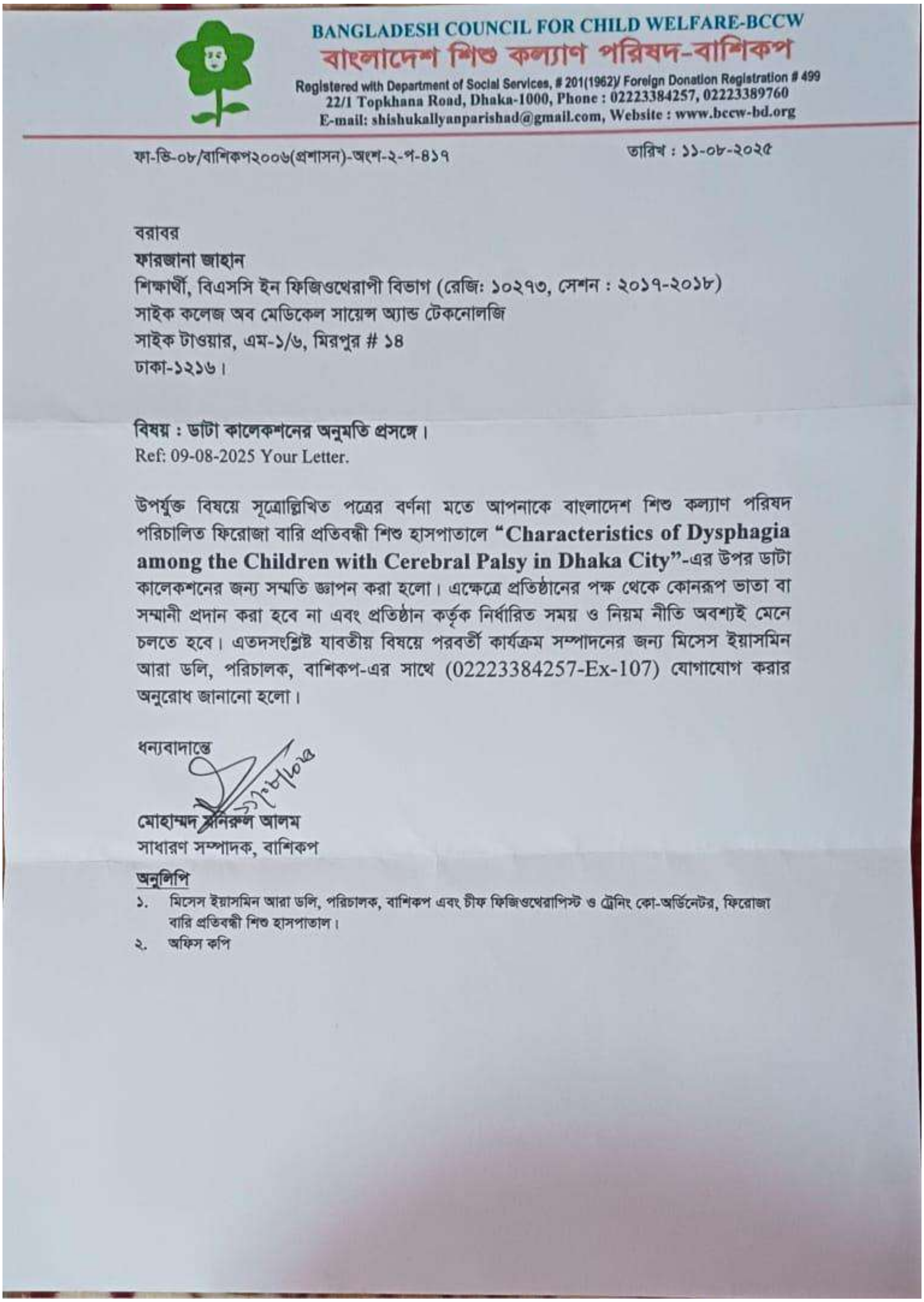
The purpose of the study is to determine the "Characteristics of dysphagia among the children with cerebral palsy in Dhaka City." The study involves face to face interview by using semi-structured questionnaire to explore the Characteristics of dysphagia among the children with cerebral palsy that may take 30 to 40 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,

Farjana Jahan

Farjana Jahan
Student of 4th Year B.Sc. in Physiotherapy
Session: 2017-2018 Reg: 10273
SCMST, Mirpur-14, Dhaka-1216, Bangladesh



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

ফা-ভি-০৮/বাশিকপ২০০৬(প্রশাসন)-অংশ-২-প-৪১৭ তারিখ : ১১-০৮-২০২৫

বরাবর
ফারজানা জাহান
শিক্ষার্থী, বিএসসি ইন ফিজিওথেরাপী বিভাগ (রেজি: ১০২৭৩, সেশন : ২০১৭-২০১৮)
সাইক কলেজ অব মেডিকেল সায়েন্স অ্যান্ড টেকনোলজি
সাইক টাওয়ার, এম-১/৬, মিরপুর # ১৪
ঢাকা-১২১৬।

বিষয় : ডাটা কালেকশনের অনুমতি প্রসঙ্গে।
Ref: 09-08-2025 Your Letter.

উপর্যুক্ত বিষয়ে সূত্রোল্লিখিত পত্রের বর্ণনা মতে আপনাকে বাংলাদেশ শিশু কল্যাণ পরিষদ পরিচালিত ফিরোজা বারি প্রতিবন্ধী শিশু হাসপাতালে **"Characteristics of Dysphagia among the Children with Cerebral Palsy in Dhaka City"**-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 চীফ ফিজিওথেরাপিস্ট ও ট্রেনিং কো-অর্ডিনেটর, ফিরোজা বারি প্রতিবন্ধী শিশু হাসপাতাল।
২. অফিস কপি

Gantt Chart

Activities/ Month	Jan 24	Feb 24	Mar 24	Ap 24	May 24	Jun 24	Jul 24	Aug 24	Sep 24	Oct 24	Nov 24	Dec 24	Jan 25	Feb 25	Mar 25	Apr 25	May 25	Jun 25	Jul 25
roposal Presentation	🟩																		
Introduction	▨	▨																	
Literature Review	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨	🟨
Methodology			🟨	🟨															
Data collection						🟧	🟧	🟧											
Data Analysis									🟩										
Result									🟦										
1st progress presentation										🟪									
Discussion											🟫								
Conclusion and Recommendation											🟥								
2nd progress presentation										🟦									
Communication with supervision	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛	⬛
Final Submission												🟦	🟦	🟦	🟦	🟦	🟦	🟦	🟦