LEVEL OF PHYSICAL ACTIVITY AMONG SCHOOL GOING CHILDREN WITH CEREBRAL PALSY

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

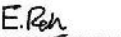**LEVEL OF PHYSICAL ACTIVITY AMONG SCHOOL GOING CHILDREN WITH CEREBRAL PALSY**

Submitted by **S. M. Maruf Hossain Sajib** for partial fulfillment of the requirements for the degree of Bachelor of Science in Physiotherapy (B. Sc. PT)
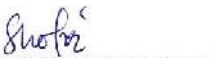
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DECLERATION

I declare that the work presented here is my own. All sources used have been cited appropriately. Any mistakes or inaccuracies are my own. I also decline that for any publication, presentation or dissemination of information of the study. I would bound to take written consent from the department of physiotherapy of Bangladesh Health Profession Institute (BHPI).

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CONTENTS

Acronyms

BHPI   **:** Bangladesh Health Professions Institute

BMRC   **:** Bangladesh Medical Research Council

CP   **:** Cerebral Palsy

CRP   **:** Centre for the Rehabilitation of the Paralysed

IPAQ   **:** International Physical Questionnaire

IRB   **:** Institutional Review Board

PA   **:** Physical Activity

SPSS   **:** Statistical Package for the Social Sciences

VPA   **:** Vigorous Physical Activity

WHO   **:** World Health Organization

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Abstract

Purpose: The purpose of the study was to find out the level of physical activity among school going children with cerebral palsy. Objectives: The aim of this study was to describe the various level of physical activity of the students of class 2- class 5 with cerebral palsy. *Methodology:* This was a cross-sectional study design in which a total 60 participants were selected conveniently for this study from William and merry taylor school. Data was collected by using International Physical Activity Questionnaire (IPAQ) to evaluate physical activity level. Descriptive statistics was used for data analysis which was displayed through table, pie chart and bar chart. It was analyzed by SPSS software version 20.0. Result**:** Among 60 participants maximum 70.0% (n=42) didn't work any vigorous physical activity for not a single day. 48.3% (n=29) didn't work any moderate physical activity for not a single day. 23.3 % (n=14) did moderate physical activity 6-7 days in a week. Maximum 120 minutes time spend for doing moderate physical activity on of those days. 41.7% (n=25). Participants walked 6-7 days at least 10 minutes at a time. They spend maximum 0-60 minutes by walking on of those day and their percentage is 31.7% (n=19). Maximum participants were not sure how much time they spend sitting every day. Analyses showed that age, class, gender were significantly associated with vigorous & moderate levels of physical activity for children with CP. Conclusion: In this study lower levels of physical activity were found in Children with cerebral palsy students. They had significantly lower daily Activity energy expenditure. They did not achieve the healthy moderate to heavy physical activity level.

Keywords: Cerebral palsy, vigorous activity, moderate activity,

CHAPTER –I	INTRODUCTION

1.1 Background

Disability is part of human state. Almost everyone will be temporarily or permanently impaired at some point in life (World Health Organization 2011). Worldwide 15.3% people are living with different kind of disability (World Health Organization 2011). In Bangladesh, there has 1.4% person with disability, which was 0.6% at 2001 census (Hasib 2012). From the different kind of disability Cerebral Palsy (CP) is the most common type with the frequency of 1.4- 2.7/ 1000 of live birth (Tabib 2009). In 2001, the United Cerebral Palsy Foundation estimated that 764,000 children and adults in the United States carried the diagnosis of cerebral palsy with different kind of disability. In addition, they estimated that 8,000 babies, infant and 1,200 to 1,500 preschool-age children are diagnosed with cerebral palsy in every year in the United States. It is the most common childhood physical disability and affects 2 to 2.5 per 1,000 born in the United State (Krigger 2006).

The incidence of Cerebral Palsy is undefined problem of Bangladesh because it is not captured in the population census or any other survey and most of the study related with CP is based on the limited geographic location (New age 2012). In 2005 one study of Bangladesh shows that, among 2,559,222 disabled children 179, 145 (7%) have cerebral palsy (Ackerman et al 2005). Where another study about 'prevalence of disability and cerebral palsy in community' which was conducted at the seven village of Narayangonj district of Bangladesh and showed the prevalence of Cerebral Palsy which was 6.1/ 1000 (Tabib 2009). Regarding sex distribution of cerebral palsy 6.8/ 1000 boys have cerebral palsy where 5.5/1000 girls have cerebral palsy (Tabib 2009).

Cerebral palsy is a neurological disorder that appears in infancy or in early childhood and permanently affect body movements and muscle coordination but it doesn't worsen over time. Though cerebral palsy affects muscle movement, it is not caused by problems in the muscles or nerves. It is caused by abnormalities in parts of the brain that control muscle movements (NINDS Cerebral Palsy Information Page 2011). So children with CP may

faces difficulties in the activities of the daily living. And the reasoning behind those difficulties are specific deficit on the motor behavior which lead deficits in motor planning that can result in slow, inefficient, behaviors (Steenbergen and Gordon 2006). It is also depends on the type or severity of the impairments (Manus, Corcoran and Perry 2008). As well this impairment is cause of their reduced number of participation (Michelsena et.al 2009). And this study is aimed to find out the level of physical activity among school going children with cerebral palsy.

Consequently it is well understood that children who has cerebral palsy, faces different kind of difficulty which is depend on the severity. And severe impairment decreased the participation of the children (Manus, Corcoran and Perry 2008). The International Classification of Functioning, Disability and Health (ICF) define participation as involvement in life situations (WHO cited in Michelsena et al. 2009). Participation is the range to which a person is actively involved in activities, for example, eating, doing sports or meeting friends; it is not what a person can or wants to do (Michelsena et al. 2009).

The basic tasks performed on a daily basis in order to engage in daily routine which are known as activities of the daily livings. Activities of daily living or self- care task may include feeding, dressing, taking care of own body through grooming and personal hygiene (i.e., toilet hygiene, bowel and bladder management, bathing or showering (Shepherd as cited in AOTA 2008).

To find out level of physical activity we used PAQ-C questioner which have been supported as valid and reliable measures of general physical activity levels from childhood to adolescence. The PAQ-C is a self-administered, 7-day recall instrument. It was developed to assess general levels of physical activity throughout the elementary school year for students in grades 4 to 8 and approximately 8 to 14 years of age. The PAQ-C can be administered in a classroom setting and provides a summary physical activity score derived from nine items, each scored on a 5-point scale. (Sallis, J. F., & Saelens, B. E. et.all ;2015)

1.2 Rational

The most common physical disability in children is cerebral palsy (CP), with prevalence of between 1.5 and 2.5 per 1000 live births in developed countries. CP describes a group of permanent disorders in the development of movement and posture that cause activity limitations, and are attributed to non progressive disturbances that occurred in the developing foetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication and behaviour, epilepsy, and secondary musculoskeletal problems. For children with the most common motor disorder (spastic CP), programmes to promote physical fitness, including strengthening and strenuous exercises, have historically been discouraged, because it was thought that they would intensify the spasticity and abnormal movement patterns. Lack of optimal physical activity may contribute to the development of secondary symptoms associated with CP, such as low fitness levels, loss of functional abilities, fatigue and osteoporosis. Despite the above-mentioned importance of implementing a healthy lifestyle at a young age, little is known about the physical activity patterns of young children with CP. (van Eck et al. 2010)

The aim of my study is to find out the level of physical activity among school going children with cerebral palsy. As a physiotherapy student it is important to know the physical activity level of the special need children. As cerebral palsy children are less physical active. So we will find out their level of physical activity. Practice of physical activity in adolescent or young age, they can be fit in their later life (Dabrowska-Galas et al.,2013) & can be safe from various chronic and non-communicable diseases like musculoskeletal problems, heart disease etc.

As physiotherapy students have enough knowledge about physical activity & physical activity is closely related to physiotherapy profession so that physical activity practices in this sector would be a part of physiotherapy profession so that it is very important to be physically active & fit by doing regular physical activity of the physiotherapy students. In Bangladesh, there is no sufficient awareness among special need children students and they are not aware about their current physical fitness level. Physiotherapy & MBBS students can play a vital role in promotion of physical activity among general population by prescribing physical activity as a part of daily life. Physical activity not only keeps healthy but also reduces depression, anxiety, stress and several authors said that physical activity improves academic performance of the students. Because of a lot of benefits of physical activity, physical activity should be practiced in regular life that's why the current activity level has to be known. And the researchers should be interested in this topic for the research study by considering the level of physical activity of the cerebral palsy students. Physiotherapy professionals are used to treat patients in a way that they have to be physically fit for their better health & wellness. They have to physically healthy and fit for the motivation of patients toward physical activity and exercise.

This study will also help to improve their awareness of a person, especially about their poor physical activity levels. The study would also attract the concentration of authority for the awareness program's necessity to aware students about physical activity and to take essential steps to success this program. This study also will be helpful for the students to do further research as the foundation of the study on this area. So, physical activity would be a working area for delivering services. Thus the study might create a future prospect of physiotherapy profession in Bangladesh.

1.3 Research question

What is the level of physical activity among the school going children with cerebral palsy

1.4 Aim

The aim of the study is to find out the level of physical activity among school going children with cerebral palsy.

1.5 Objectives

1.5.1 General objective

 To find out the level of physical activity among school going children with cerebral palsy.

1.5.2 Specific objectives

- TO find out sociodemographic information
- To find out the level of physical activity among male & female students of cerebral palsy in William and merry Taylor school.

- To describe the physical activity level of 5- 16 year-old children with CP.

- To determine the association of physical activity with characteristics, characteristics of body function and structure and personal and environmental characteristics

- To compare age and level of physical activity of the participants.

- To find out the barriers of physical activity of the participants.

1.6 List of variables:

Independent variable		Dependent variable

- ☐Socio-demographic factors

- Body Mass Index

- Knowledge about physical activity

- Self-consider as physically active

- Sports facilities Physical activity

- Playground

- Barriers of physical activity

- Vigorous physical activity

- Moderate physical activity walking

- Sitting time

Physical activity
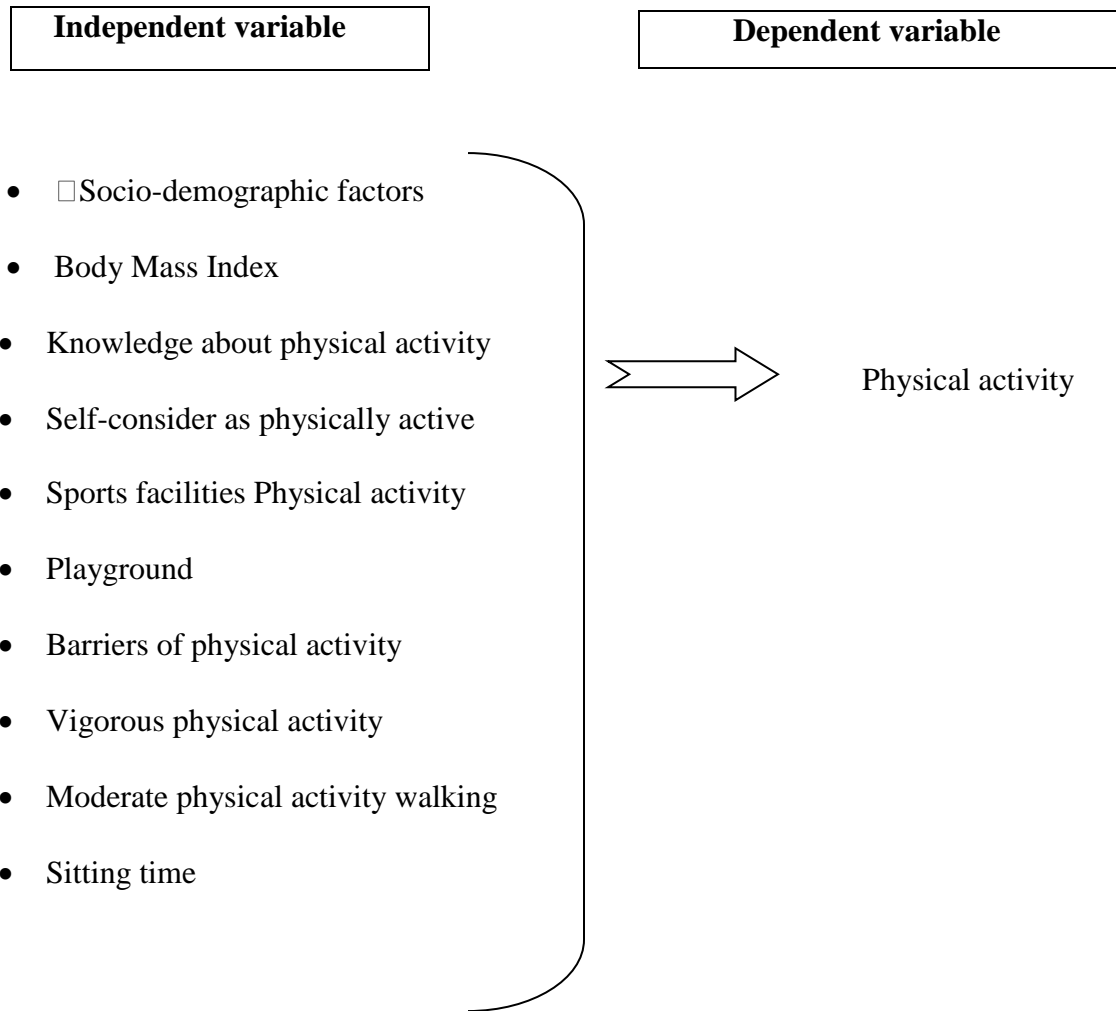
1.7 Operational Definition

Cerebral palsy

Cerebral palsy is a condition caused by damage to the brain, usually occurring before, during or after birth. It results in sensory motor disorders that affects the control of posture and movement and caused by birth injury, congenital defects, and infectious disease

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Physical activity

Physical activity is also defined as a behavior in the context of energy expenditure or any body movement produced by the skeletal muscles and resulting in a substantial increase over the resting energy expenditure (Manila, 2011).

Moderate physical activity

An aerobic activity that lasts between 30 to 60 minutes maintaining a conversation uninterrupted.

Vigorous physical activity

An aerobic activity that lasts up to 30 minutes & conversation can't be maintained uninterrupted.

MET

Metabolic Equivalent for Task (MET) is a resting energy expenditure assuming oxygen consumption of 3.5 ml-min/kg weight.

Cerebral palsy exactly means brain paralysis (Alvarez, 2013). 'Cerebral' refers to the brain and 'Palsy' to a disorder of movement or pressure. If someone has cerebral palsy it means because of an injury to the brain (cerebral) he or she is not able to use some of the muscles of body in normal way. CP is a group of condition that affects the movement and posture of body. Cerebral palsy is the most common neurodevelopmental motor disability in children. The condition requires medical, educational, social, and rehabilitative resources throughout the lifespan (Hurley et al., 2011). Cerebral palsy is considered to be a non-life-threatening condition when the children born with the exception in severe case. In adulthood, most of the children with cerebral palsy are expected to live well (Mychild, 2013). Cerebral palsy is a disorder of movement, muscle tone or posture that is caused by injury or abnormal development in the immature brain, most often before birth (Myoclinic, 2013). Until 1-3 years of life, cerebral palsy is not often identified but it is a birth defected diseases. Control of the movement and posture that affect are caused by CP. An affected child cannot move his muscles of the body normally because damage of the brain areathat that control of the movement (American pregnancy association, 2013). According to the Surveillance of CP in Europe (SCPE) definition, cerebral palsy is a group of permanent and non-progressive disorders of movement and posture caused by a central nervous lesion, damage or dysfunction originating early in life (Elkamil et al., 2011). Cerebral palsy is the most common chronic motor disorder of childhood, affecting approximately 2 to 2.5 infants per 1,000 live births. The increase in survival rates for preterm infants has amplified the risk of brain injuries that potentially cause CP. In addition to immeasurable health, social, and psychological problems that the affected children and their families suffer CP has a huge economic impact (Faria et al., 2011).

Cousin marriage is one of the responsible occurring for cerebral palsy. Since cousins have one or both grandparents in common and if either of the two grandparents, maternal or paternal carries a defective recessive gene, it stands a good chance of becoming homozygous in any one child who is a product of such consanguineous marriages (Islam & Ahmed, 2009). The risk of neonatal are increased in white matter damage and later motor, cognitive, and behavioral impairmentswhile babies born at very low gestational

ages. The low gestational age and cerebral white matter damage lead to preterm birth can damage the developing brain. The pregnancy disorder is also potential factor for damaging the developing brain. Cranial ultrasound lesions was manifested that also causes CP diagnosed later (McElrath et al., 2009). Cerebral palsy is a long term condition and most common physical disability in childhood. In adulthood children with cerebral palsy is poorly understood and usually survive. There is a male: female ratio of 1.5:1 in the population (Clinical Key,2012).In developed countries, International assessments propose that CP affects between 1.2 and 3.0 per 1000 children (Hustad et al., 2011). In the Norwegian counties there were 494 children with CP born between 1st January 1996 and 31st December 2003, corresponding to a prevalence of 2.65 per 1000 live births (Elkamil et al., 2011). In United States, there are living almost 800,000 children and adults inwith one or more of the symptoms of cerebral palsy estimated the Foundation of the United Cerebral Palsy (UCP). Every year about 10,000 babies born in the United States will develop cerebral palsy according to the federal government's (Centers for Disease Control and Prevention National Institute of Neurological Disorder and Stroke, 2012). In United States, the specific prevalence of CP is uncertain because consistent information is lacking on follow-up of an entire population. Majority of births especially involve for term and late preterm infants. In the United States estimated a prevalence of 3.6 cases per 1000 children at eight years of age where a population study was showed, using data from three regions but the study between children with and without a history of prematurity did not distinguish (Miller, 2013). The United States shows that CP may affect up to 3.6 per 1000 children in another study (Hustad et al., 2011).

The prevalence ispresentedthat 1.5 to 2.5 per 1,000 live births. In CP, time trends are due to advances in perinatal care in the last 40 years. During the 1980s, there was a sharp increase in very low birth weight infants in prevalence of CP. For infants inintensive care which has been attributed to the increased survival due to advances stages of life. This recent increase seems to have leveled off and may be on the decline. Mild forms of CP patients not severe in functional impairment may remain undiagnosed, which leads to underestimation of the true prevalence of CP (Clinical Key, 2012). The prevalence of disability of moderate and severe is estimated to be 5% in children aged 0–14 years. In low-income countries disability among children is more common than high-income

countries (Kawakatsu et al., 2012). Before birth, occurs the disruption of normal development of the brain result of CP in about 70% cases. According to a 2003 report by the American College of Obstetricians and Gynecologists (ACOG) and the American Academy of Pediatrics (AAP) conflicting to common belief that lack of oxygen reaching the fetus during labor and delivery contributes to only a small minority of cases of cerebral palsy. A slight number of babies also develop brain injuries in the first months or years of life result in cerebral palsy. In child the cause of cerebral palsy is unknown in many cases (American pregnancy association, 2013). We know the cause of CP is unknown. Brain injury or brain malformation is the cause of cerebral palsy that occurs while the brain is developing — before, during or after birth. Muscle control, muscle coordination, muscle tone, reflex, posture and balance also disturbed due to cerebral palsy. It can also impact fine motor skills, gross motor skills and oral motor functioning (My child, 2002). In many cases, the cause of congenital cerebral palsy is not identified. According to the timing of the brain insult, CP is valuable to classify the known causes whether prenatal, perinatal or postnatal. Congenitally brain malformations which including malformations of cortical development are caused by antenatal of CP. In general congenital malformations are strongly connected with cerebral palsy and children with congenital brain malformations also have more anomalies outside of the central nervous system. Metabolic disorders, maternal ingestion of toxins and rare genetic syndromes are less common cause of CP (Reddihough & Collins, 2010). During a baby's development in the womb, congenital cerebral palsy results from brain injury. It is present at birth although it may not be detected for months. It is responsible for about 70% of children of cerebral palsy (WebMD, 2013). Cerebral palsy includes a group of permanent disorders of movement or posture caused by an early brain injury. Although several factors including preterm birth and low birth weight for gestation are associated with excess risk, the causes of cerebral palsy remain largely unknown. Pre-eclampsia affects 3-5% of pregnant women and is characterized by maternal hypertension and proteinuria occurring after 20 weeks of gestation. Serious manifestations may induce iatrogenic preterm delivery and pre-eclampsia contributes substantially to prematurity, perinatal morbidity, and mortality. Early onset pre-eclampsiais commonly associated with severe placental dysfunction, which can compromise fetal blood supply and cause

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fetal growth restriction, chronic hypoxemia and possibly brain damage. Hence it is plausible that pre-eclampsia could be a risk factor for cerebral palsy (Melheim et al., 2013). CP is classified into four categories. They are Spastic, Athetoid, Ataxia and Mixed type of CP. Spastic cerebral palsy is the most common type of CP. Spastic cerebral palsy refers to the increased tone, or tension, in a muscle when normal muscles work in pairs. Allowing free movement in the desired direction when one group contracts and the other group relaxes. The flow of muscle tension and the normal ebb is disrupted, due to complications in brain-to-nerve-to-muscle communication. Muscles affected by spastic cerebral palsy become active together and restricted in actual movement. This causes the muscles in spastic cerebral palsy patients to be constantly tense or spastic. Mild cases of spastic cerebral palsy patients may have affect only a few movements or severe cases that can affect the whole body. Although spastic cerebral palsy is non-progressive disorder as brain damage does not get worse over time, spasticity in muscles can increase over time. In spastic cerebral palsy can limit the range of movement in the joints when increased muscle tones and stiffness. Leading to excessive fatigue the effects of spastic cerebral palsy may increase with anxiety or exerted effort (Cerebral palsy source, 2013).

The second most common type of cerebral palsy is athetoid or dyskinetic. Dyskinesia means repetitive movements almost like a tic while an athetosis person who has slow involuntary movements especially in the arms. Muscle tone has varied with this type of CP children. Sometimes their muscles are stiff and rigid and other. Times they are loose and floppy. Athetoid or dsykinetic CP results from damage to one or more of these areas of the brain- the basal ganglia, the corticospinal tract and the motor cortex. May have difficulty in walking, talking, eating, sitting upright, and performing basic motor skills in case of athetoid type of CP (Discovery fit and health, 2013). Now-a-days about 4% of people have cerebral palsy. Inability to activate the correct pattern of muscles during movement ataxia is defined. To find out very difficult to balance of people with ataxic cerebral palsy. Ataxia affects the whole body. They may also have poor spatial awareness which means it is difficult for them to judge their body position relative to things around them. Most people with ataxic cerebral palsy can walk but they will probably be unsteady with shaky movements. Speech and language can also be affected. Many children with cerebral palsy have multiple symptoms with combinations of the various forms of

cerebral palsy. For example children with spastic cerebral palsy often continue to have a head lag which is represent ative of hypotonic (Medicine net.com, 2013). From literally pathology which thestudy of disease is unique because it is a basic science as well as a medical consultant. It is indeed a fundamental discipline necessary in the education of all medical doctors which concepts of disease processes, tissue reaction and injury (Prahlow & Vogel, 1994). Importantly all four criteria must be met: 1) Evidence of metabolic acidosis in fetal umbilical cord arterial blood obtained at delivery, 2) Early onset of severe or moderate neonatal encephalopathy in infants born at 34 or more weeks' gestation,3) Cerebral palsy of the spastic quadriplegic or dyskinetic type and4) Exclusion of other identifiable etiologies, such as trauma, coagulation disorders, infectious conditions or genetic disorders (Hankins, 2003).

In residential care quadriplegic cerebral palsy with children and young adults has been observed in high incidence of long-bone fractures the majority of fractures were in the upper extremities (Developmental Medicine & Child Neurology, 2002). Pathological changes in hip in cerebral palsy children.In children with CP the secondary musculoskeletal problem is hip displacement. Children with CP are demonstrated progression of hip displacement from early age, while children are born with allocated hips. In the incidence of non-ambulatory children are impaired, insevere cases (Boyd et al., 2013). Some hip deformities in cerebral palsy, they are: coxavalga, slanting acetabula, subluxation, dislocated upward and coxavara. We also belief that the semi-tendinosus and semi-membranous is involved in both the hip adduction and the knee flexion deformities. During operation tenotomy is performed that is maintained stretch reflex (Baker et al., 1962). Cerebral palsy is a neurological disorder the signs or symptoms of cerebral palsy may appear soon after birth or may take several months (Mandal, 2013). The most common early sign of cerebral palsy is developmental delay. Delay in reaching key growth milestones such as rolling over, sitting, crawling and walking are cause for concern. Physicians will also look for signs such as abnormal muscle tone, unusual posture, persistent infant reflexes and early development of hand preference (My child, 2013). Common signs of severe CP that may be noticed shortly after birth include: problems sucking and swallowing, weak or shrill cry, seizures and unusual positions. Often the body is either very relaxed or floppy or very stiff (WebMD, 2011). In some

severe cases many signs and symptoms are not readily visible at birth except and may appear within the first three to five years of life as the brain and child developed (My child, 2013). Severe motor and coordination impairment also occur (Mandal, 2013). Drooling is another but common symptom among children with CP. The prevalence has been showed from 16.8% to 58%. Frequent drooling may cause skin maceration and infection, body fluid loss, and recurrent pneumonia. At school and at home, children with salivary secretions may cause damage to books, teaching materials and furniture, and it even interferes with social relationships. It is informedthat children with CP that drool are often avoided by other children, and familiar and unfamiliar adults. The drooling in children with CP could affect within crease their dependent level of care of daily living and their educational level. Some studies advise that drooling might be associated with a reduced quality of life among children with CP (Chang et al., 2012). Brain structure damage is irreversible and permanent. And the symptoms are variable that changed over time. Children have movement and postural disorder associated with many disabilities such as- including intellectual disability, hearing and visual deficits, nutrition, feeding and swallowing problems, respiratory infections and epilepsy. Cerebral palsy suffers for long term and it affect activities of daily living and quality of life (Bell et al., 2010). The most common type of cerebral palsy is spastic CP. It causes the muscles to be stiff and permanently contracted. The names of these types combine a Latin prefix describing the number of affected limbs with the term plegia meaning paralyzed or weak: diplegia–either both arms or both leg,hemiplegia–limbs on only one side of the body, quadriplegia–all four limbs, monoplegia–one limb andtriplegia–three limbs. Spastic diplegia affects the legs more than the arms (Health.com, 2013). Signs can appear during several stages of early life. They include:neonatal – early Infancy (0-3 Months): high pitched cry, poor neckcontrol, excessive lethargy or irritability, weak suck or tongue thrust ortonic bite, oral hypersensitivity, decreased interest in surroundings, stiff or floppy posture, abnormal or prolonged reflexes.Later infancy-inability to perform motor skills control of hand grasp by 3 months, rolling over by 5 months and independent sitting by 7 months. Abnormal developmental patterns: hand preference by 12 months, excessive arching of back, prolonged or abnormal parachute response, logrolling. Abnormal developmental patterns after 1 year of age: W sitting means both knee flexion, legs

extremely rotation, bottom shuffling means scoots along the floor, tiptoe walking or hopping (Gershon et al., 2013). The symptoms of cerebral palsy include: excessive drooling, difficulty swallowing, sucking or speaking, tremors, and trouble with fine motor skills such as fastening buttons or holding a pencil, stiff or tight muscles, low muscle tone, exaggeratedreflexes, uncontrolled body movement, toe walking, limping or dragging a foot while walking, walking with a scissor gait, turning in their legs as they walk. Children with cerebral palsy can also have feeding problems, mental retardation, seizures, learning disabilities and problems with their vision and hearing. The symptoms don't worsen with age but symptoms can range from mild to severe (Iannelli, 2008). The specific type of cerebral palsy is determined by the extent, type and location of a child's abnormalities. Classification of cerebral palsy depends on the type of movement disorder spastic (stiff muscles), athetoid (writhing movements) or ataxic (poor balance and coordination).Type of cerebral palsy is also classified affected limbs (National Institute of Neurological Disorder and Stroke, 2012). Poor growth and nutritional status are commonly reported in children with CP. Conversely, there is evidence to suggest that certain children with CP are at risk of obesity, particularly those with marked spasticity and who are relatively inactive. Poor growth is frequently considered a normal, untreatable side-effect of CP (Bell et al., 2010). During pregnancy maternal infections have been associated with a wide variety of neurological and psychiatric disorders in the children, such as cerebral palsy, epilepsy, autism, and schizophrenia, respectivelywhether the risk of cerebral palsy and epilepsy in the children is related to paternal infections occurring either during pregnancy or within the five year period before pregnancy. The underlying hypothesis is that maternal infections occurring before pregnancy increases the risk of cerebral palsy and epilepsy in the children. Under the hypothesis we would expect no associations between paternal infections and the outcomes under study (Wu et al., 2013). The component of diagnosis is physical examination and medical history taking.Development and any other problem of child are assessed. Tests such as a CT scan, MRI, and ultrasound are used to find out the cause of cerebral palsy (Health Link BC, 2013). There is no cure for CP but treatment can improve the lives of those who have the condition. It is important to begin a treatment program as early as possible (Center for Disease Control and Prevention, 2012).

A multidisciplinary team approach is effective for the treatment of CP. The multidisciplinary team includes health care professionals such as pediatricians, rehabilitation specialists, neurologists and physiotherapists, occupational therapists and speech therapists. The multidisciplinary team develops an individualized treatment plan depending on the severity of cerebral palsy (Physician & Nurses, 2013). To achieve their goal strive to: 1) Help children with cerebral palsy achieve maximum physical, intellectual and emotional development 2) Educate patients, parents and the community about children with cerebral palsy 3) Develop and promote clinical research programs that will advance the pharmacological, surgical and therapeutic treatment of cerebral palsy 4) Continue making advances in the diagnosis, management and treatment of cerebral palsy (Children's Hospital, 2013). Cerebral palsy is not progressive disorder (Children's Hospital Colorado, 2012). Medications can lessen the tightness of muscles that is used to improve functional abilities, treat pain and manage complications related to spasticity (Myoclinic, 2013). Moreover, secondary conditions such as spasticity can get worse over time. As the spasticity continues progressive deformities of the muscles, bones and joints can occur (Children's Hospital Colorado, 2012). Some causes of cerebral palsy have been identified and cases of cerebral palsy that result from them often can be prevented. Rh disease and congenital rubella syndrome used to be important causes of cerebral palsy. Now Rh disease usually can be prevented when an Rh-negative pregnant woman receives appropriate care. Women can be tested for immunity to rubella before pregnancy and be vaccinated if they are not immune. Babies with severe jaundice can be treated with special lights which another name is phototherapy. Head injuries in babies a significant cause of cerebral palsy in the early months of life (American pregnancy association, 2013). There are various complication cerebral palsy such as cognitive impairment, blindness and hearing loss to impairment of short term memory ,strabismus, language delays, learning difficulties and behavioral disorders (Ballot et al., 2012). Cerebral palsy can range from mild to severe. Children with mild cerebral palsy may lead a near-normal life with appropriate treatment. Children with severe symptoms require life-long care. The child may or may not be able to walk, speak and self-care. Proper care and treatment can maximize the child's potential (Livestrong.com, 2009). Prognosis of the child depends on the level of brain damage. Cerebral Palsy can't be

cured but due patients can enjoy near-normal lives if their neurological problems are properly managed (Right diagnosis, 2013).

CHAPTER –III: METHODOLOGY

3.1 Study design

In this study, the investigator used a prospective cross-sectional survey of the quantitative research design. The investigator used this method to fulfill the aim and objectives of the study. The cross-sectional design is the best suited method for the presenting a situation over a short period of time. Using this study design, the investigator collected information about the level of physical activity among school going children with cerebral palsy. The investigator has chosen this design as a means of using large number of participants and then collecting data accurately.

3.2 Study area

The investigator selected William and merry taylor school at CRP. The school offers an energetic and dynamic environment.

3.3 Study population

This study targeted all types of cerebral palsy children those who are studying from this school.

3.4 Inclusion criteria

- Students from class 2-5
- Age group between 5-16 years.
- Both male and female participants.
- Participants would be children with cerebral palsy.
- Minimum of activity per day was included in the analysis.

3.5 Exclusion criteria

- Participants who were above class 5.
- Participants who were not willing to participants.
- Participants those are study below class 1.
- Participants excepts cerebral palsy problem.

- Participants those are not students.

3.6 Sample size

A sample was a smaller group taken from the population. Sometimes the sample size

May be big and sometimes it may be small, depending on the population and the

Characteristics of the study. Sampling procedure for cross sectional study done by following equation

By following $n = \left\{\frac{z-\frac{\alpha}{2}}{d}\right\}^2 \times pq = \left\{\frac{1.96}{0.01}\right\}^2 \times 0.0016 \times 0.9984 = 60$

(Where z=1.96, p= 0.0016, q= 1-p, d=0.01), (According to WHO, 2016)

So total sample size will be 60

3.7 Sampling technique

Purposive sampling technique was used for sample selection. Purposive sampling start with a purpose in mind and the sample is thus selected to include people of interest and exclude those who do not suit the purpose. Usually population is too large for the attempt to survey all of it member. A small, but carefully chosen sample can be used to represent the sample .The sample reflects the characteristics of the population from which it is drawn. Sample were met the inclusion and exclusion criteria and participated in the study voluntarily.

3.8 Data collection method and tools

The children from William and marry taylor school who were available asked to participate in the study. Data was collected by using a semi structured questionnaire

paper. There were used Bangla questionnaires with simple wording because all the participants had understood better in Bangla. And questionnaires asked by the data collector due to find appropriate answer. The data collector tool was pen and pencils, height measurement tape, weight machine to measure weight of the children, stop watch for measure pulse rate and respiratory rate, Paper, approved from and consents from and bag for storing this tools etc. A pilot study done according to questionnaire.

3.9 Data collection procedure

Questionnaire was provide demographic information such as age, sex, school, grade . We are trying to find out about your level of physical activity from the last 7 days (in the last week). This includes sports or dance that make you sweat or make your legs feel tired, or games that make you breathe hard, like tag, skipping, running, climbing, and others. It was taken by

Five Easy Steps

- Item 1 (Spare time activity) - Take the mean of all activities ("no" activity being a 1, "7 times or more" being a 5) on the activity checklist to form a composite score for item   1.
- Items 2 to 8 (PE, recess, lunch, right after school, evening, weekends, and describes you best) - The answers for each item start from the lowest activity response and progress to the highest activity response - Simply use the reported value that is checked off for each item (the lowest activity response being a 1 and the highest activity response being 5).
- Item 9 - Take the mean of all days of the week ("none" being a 1, "very often" being a 5) to form a composite score for item 9.
- Item 10 - Can be used to identify students who had unusual activity during the previous week, but this question is NOT used as part of the summary activity score.
- How to calculate the final PAQ-C activity summary score
- Once have a value from 1 to 5 for each of the 9 items (items 1 to 9) used in the physical activity composite score, you simply take the mean of these 9 items,

which results in the final PAQ-C activity summary score. A score of 1 indicates low physical activity, whereas a score of 5 indicates high physical activity.

3.10 Questionnaire

Various levels of physical activity participation are associated with health benefits and/or health risks. As a result, it is important that we have valid tools for assessing physical activity at various ages. This becomes particularly important with longitudinal research, which might span a number of years. The Physical Activity Questionnaire for Older Children is PAQ-C. The PAQ-C is appropriate for elementary school-aged children (grades 4-8; approximately ages 8-14) who are currently in the school system and have recess as a regular part of their school week. The PAQ-C is a self-administered, 7-day recall instrument. It was developed to assess general levels of physical activity throughout the elementary school year for students in grades 4 to 8 and approximately 8 to 14 years of age. The PAQ-C can be administered in a classroom setting and provides a summary physical activity score derived from nine items, each scored on a 5-point scale.

 The PAQ-C have been supported as valid and reliable measures of general physical activity levels from childhood to adolescence. The PAQs' measurement of general physical activity levels is one its strengths because it is difficult to precisely measure intensity, frequency, and duration of young people's activities, especially with self-report (Kowalski, Crocker, & Faulkner, 1997)   2) The PAQs utilize memory cues such as lunch and evening items to enhance the recall ability of children and adolescents.   3) The PAQ-C are cost and time efficient, easy to administer to large-scale populations, and display normal distribution properties.

The following paragraphs summarize the original development, validity, and reliability studies for the PAQ-C. The summaries provide a brief synopsis of each study's findings

Evidence was provided that supported the PAQ-C as a reliable and valid measure of general physical activity levels in children during the school year. In three studies, Crocker, Bailey, Faulkner, Kowalski, and McGrath (1997) administered the PAQ-C to (N = 215, N = 84, and N = 200) elementary school children during the school year. The

children were between the ages of 8 to 16 and attended a public school. In the first study, the item and scale properties of the PAQ-C were examined. Ninety girls and 125 boys (ages 9-15) completed the PAQ-C on the same day. The mean activity score for females was 2.96 (SD = 0.69) and 3.44 (SD = 0.68) for males. Boys were significantly more active than girls with respect to the PAQ-C mean scores, t (213) = 5.15, p < 0.01, and each item score (p < 0.05), excluding the physical education item (p < 0.08). The item scale correlations were all above 0.30, and the scale reliability was acceptable for both females (α = 0.83) and males (α = 0.80). Recess and lunch items had the lowest correlations with the other items for males (r = 0.33 and 0.30 respectively) and females (r = 0.42 and 0.55 respectively). Most PAQ-C items had means close to the center of the range and the variability was acceptable. Overall, the PAQ-C was found to have acceptable measurement properties. The second study examined the PAQ-C's test re-test reliability, internal consistency, and sensitivity to gender differences. Forty-three boys and 41 girls (ages 9-14) completed the PAQC. The children were assessed twice during school hours with one week in between assessments. The PAQ-C was relatively stable over the one-week assessment period (males, r = 0.75 and females, r = 0.82). However, further analysis showed significant increases in PAQ-C activity scores for both males, 2.85 (SD = 0.73) to 3.16 (SD = 0.91) and females, 2.56 (SD = 0.65) to 2.79 (SD = 0.80) over the two assessments, F (1,83) = 22.26, p < 0.01. Crocker et al. (1997) suggested a possible rationale for the increase in activity might be due to the change in weather. The first assessment week was cold and snowy, whereas the second assessment week was much warmer. The internal consistency for the first assessment was (α=0.79) and (α = 0.89) for the second assessment. In general, the boys were found to be more active than the girls for weeks one and two, t (82) = 1.93, p < 0.05 and t (82) = 1.97, p < 0.05 respectively. The results of this study provide support for the test-retest reliability of the PAQ-C, and, similar to study 1, showed that the PAQ-C was sensitive to gender differences in physical activity levels.   The third study examined the reliability of the averages of 2 or 3 PAQ-C scores as a composite yearly activity score for children. Ninety-eight boys and 102 girls (ages 8-16) who were participants in the Saskatchewan pediatric bone study completed the PAQ-C. The PAQ-C was slightly modified for the adolescent participants with the recess item omitted, and some of the activity checklist

items were changed to represent adolescent activity choices. Using generalizability theory, the results suggested that the use of 3 and 2 PAQ-C scores as a yearly activity composite score were reliable for younger participants (G = 0.86 and G = 0.80 respectively) and older participants (G = 0.90 and G = 0.85 respectively). Sex, $F_{(1,199)}$ = 20.22, $p < 0.01$, and time, $F_{(2,398)}$ = 34.34, $p < 0.01$, effects were found. The marginal mean male activity score was higher than females'. Students were more active in April than Oct-Nov. In summary, the PAQ-C had acceptable measurement properties, internal consistency, and reliability for using the average of either two or three PAQ-C scores gathered during fall, winter, and spring. These results provided initial support that the PAQ-C is a valid measure of physical activity in children. (Kowalski, Crocker, & Faulkner, et, al ; 1997)

3.11 Data Analysis

Data was analyzed in Microsoft office Excel 2010 using a SPSS 16 version software program. All the data entered into the computer with specific coding and then analyzed using Statistical Package for the Social Sciences (SPSS) 16 version. The results were presented with the use of percentage (%). The collected data presented with tables, bar charts and pie chart etc.

3.12 Ethical issues

The research proposal was submitted to the Institutional Review Board (IRB) of Bangladesh Health Profession Institute (BHPI). Bangladesh Medical Research Council (BMRC) and World Health Organization (WHO) guideline also were followed to conduct this study.

3.13 Informed consent

Written consent (Appendix) was given to all participants prior to completion of the questionnaire. The written consent was taken from every participants including signature. The participants were informed clearly that their information would be kept confidential. The participants was informed or given notice that the research result would not be harmful for them. It was explained that there might not a direct benefit from the study for

the participants but in the future case like them might get benefit from it. The participants had the rights to withdraw consent and discontinue participation at any time. It should be assured the participant that his or her name or address would not be used. The information of the subjects might be published in any normal presentation or seminar or writing but they would not be identified. Every participant had the right to discuss about their problems with senior authority.

CHAPTER –IV: RESULTS

The purpose of the study was to find out the level of physical activity among the school going children with cerebral palsy and to achieve this goal the results need to calculate & analyze in a systematic way. Data was analyzed by descriptive statistics and calculated by percentages and presented by pie charts, bar charts and tables.

4.1. Socio demographic

In this socio demographic chart total participants was 60. Among them maximum participants was age range 11-15 and percentage was 47% (n=28). Participants from minimum age range was 16-20 and percentage was 9.7 % (n=6). From class maximum participant was from class 2 and percent was 25.0% (n=15).Minimum participants was from class 5 and percentage was 15.0% (n=9). Height range of maximum participants was 4.1-4.5 feet and percentage was 38.3 % (n=23) minimum range of height was 5.6-6 feet and percentage was 3.3% (n=2). In this research the most participant was boy. Participants range was 63.3% (n=38). The maximum range of weight from participants was 21-30 kg and percentage was 40% (n=24).

Table 1: Socio demographic chart

variable	Frequency	percent
Age		
6-10	26	43.3
11-15	28	47.0
16-20	6	9.7
Class		
Class 1	11	18.3
Class 2	15	25.0
Class 3	11	18.3
Class 4	14	23.3
Class 5	9	15.0
Height		
3-3.5 feet	3	5.0
3.6-4 feet	9	15.0
4.1-4.5 feet	23	38.3
4.6-5 feet	18	30.0
5.1- 5.5 feet	5	8.3
5.6-6 feet	2	3.3
Gender		
Boy	38	63.3
Girl	22	36.7

4.1.1 Weight of the participants

In this chart we can see that the maximum participants was weight range between 21-30 kg and their percentage is 40% where frequency 24. The lowest participants was weight range between 0-10 kg and percentage was 1.7% (n=1).
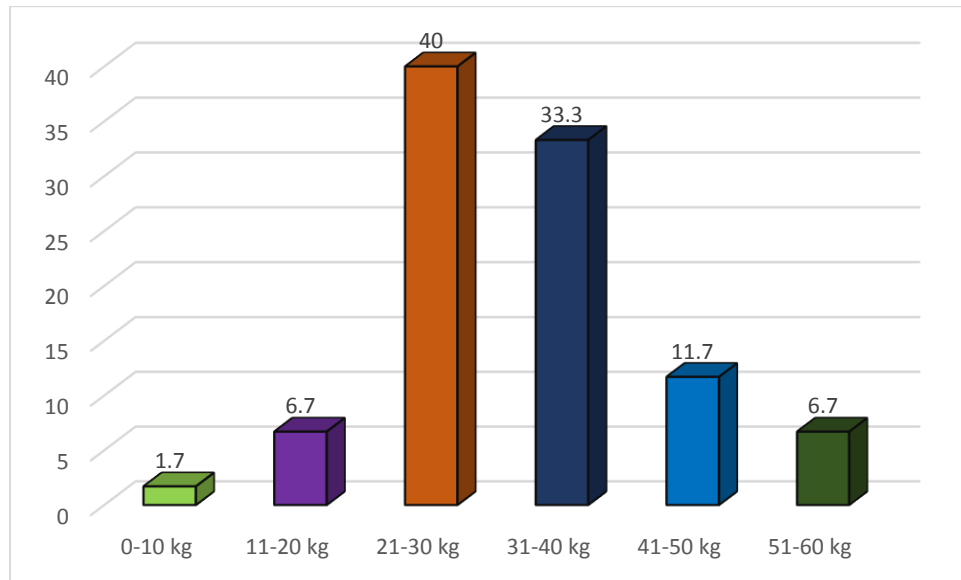

Fig 1: Weight of the participants

Table 2 : Various Level of Physical activity

Variable	Frequency	Percent
Knowledge about physical activity		
Yes	37	61.7
No	23	38.3
Consider as physically active person		
	15	25.0
yes	45	75.0
No		
Sports facility at school		
	60	100.0
yes		
Playground in school		
	60	100.0
yes		
Belong to the academic sports association		
	50	83.3
yes	10	16.7
no		
Interested of doing physical activity	26	43.3
yes	34	56.7
No		
Barrier to do physical activity	39	65.0
yes	21	35.0
no		
Carrying of school bag		
	26	43.3
yes	33	55.0
no		
Classroom of the participants	38	63.3
ground floor	22	36.7
1st floor		
carrying of school bag to classroom	27	45.0
yes	33	55.0
no		
Total	60	100

In this research the total participant was 60. In the chart we can see that most of the participants has knowledge about physical activity and its percentage is 61.7% (n=37). 75.0% (n=45) participants consider their as a physically active person .All participants have sports facility and playground in their school and 83.3% (n=50) participants Belong to the academic sports association. 56.7% (n=34) participants had no interest of doing any physical activity. 65.0% (n=39) participants had barrier to do physical activity. 55.0% (n=33) participants was not able carrying of school bag. 63.3% (n=38) participants classroom was in ground floor. And 55.0% (n=33) participants was not able to carrying their schoolbag to the classroom.

4.1.2 Heart rate

 Heart rate 81-90 was the maximum for the participants. And we can see in this chart that the red marks shows 53% (n=32) for heart rate range 81-90.
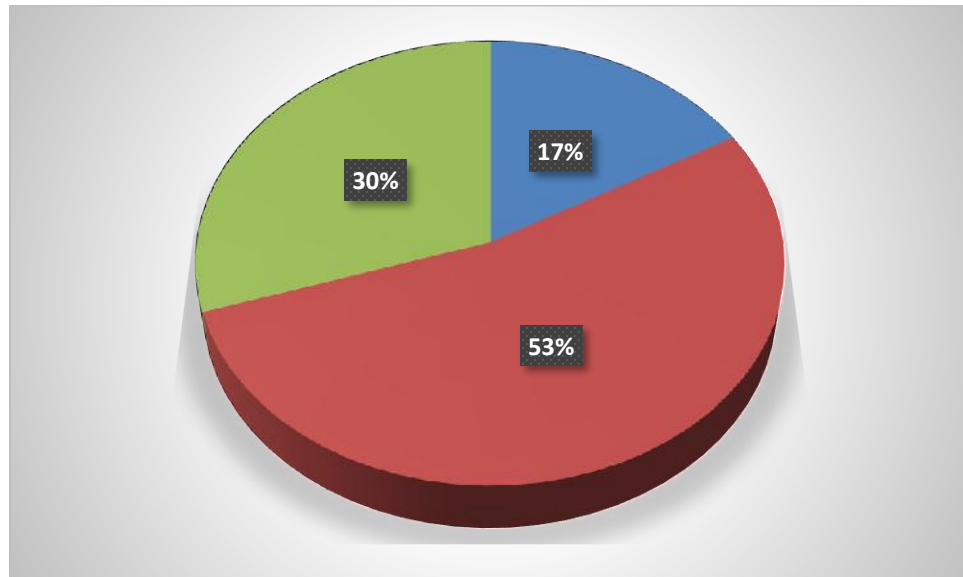
Fig 2: Heart rate

4.1.3 Respiratory rate

In this diagram we see that the respiratory range between 21-25 is maximum. And its percentage is 46.7% (n=28).
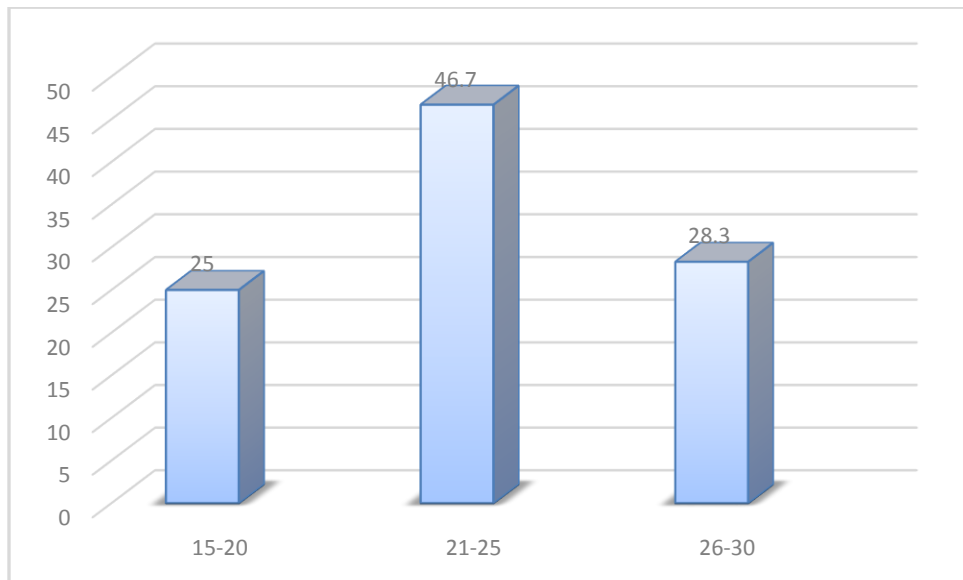
Fig 3: Respiratory rate

4.1.4 Weight of school bag

In this pie chart we can see that among 60 participants most of the participant's school bag weight was 1.5-2.5 kg. And this percentage was 40% (n=24). Very few participants was able to carry school bag weight range between 4.5-5.5 kg and their percentage is 3% (n=2).
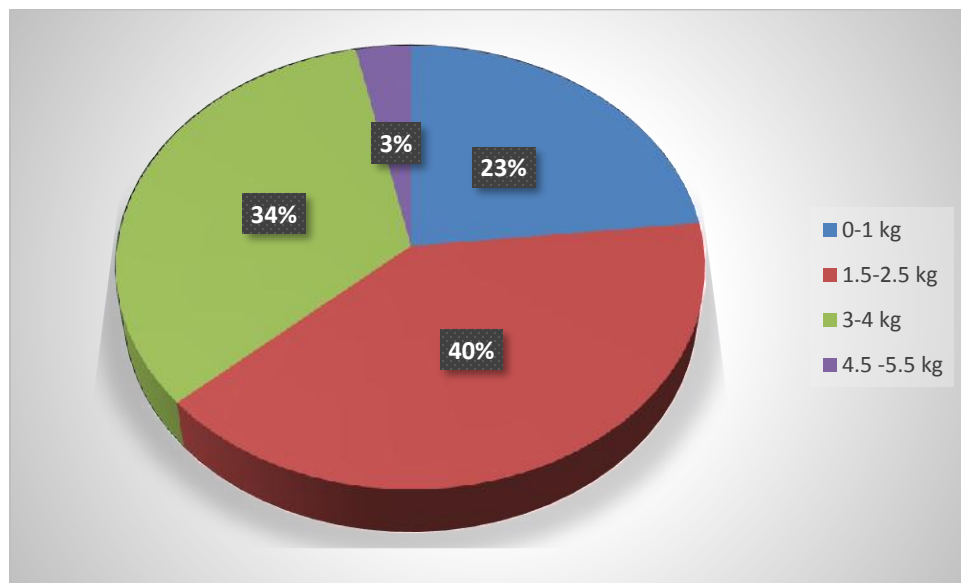
Fig 4: Weight of school bag

Table 3: Vigorous physical activity and time spend for doing vigorous physical activity

We can see in this table that among 60 participants maximum 70.0% (n=42) didn't work any vigorous physical activity for not a single day. And only 1.7% (n=1) did vigorous physical activity that was the minimum score for this table.

Variable	Frequency	Percent
During the last 7 days vigorous physical activity doing by the participants like heavy lifting, any heavy task, aerobics, or fast bicycling		
0-1 day	1	1.7
2-3 days	4	6.7
4-5 days	9	15.0
6-7 days	4	6.7
not a single day	42	70.0
Total	60	100
Time spend by the participants doing vigorous physical activity on of those days		
0-60 minutes	7	11.7
1-2 hours	6	10.0
3-4 hours	3	5.0
not sure	1	1.7
Total	17	28.3

Table 4: Moderate physical activity and time spend for doing moderate physical activity

We can see in this table that among 60 participants maximum 48.3% (n=29) didn't work any moderate physical activity for not a single day. And lowest participants 6.7% (n=4) did moderate physical activity for 2-3 days. Maximum 120 minutes time spend for doing moderate physical activity on of those days.

Variable	Frequency	Percent
During the last 7 days moderate physical activity doing by the participants like carrying light load, bicycling at a regular pace or doubles tennis		
2-3 days	4	6.7
4-5 days	13	21.7
6-7 days	14	23.3
not a single day	29	48.3
Total	60	100
Time spend by the participants doing moderate physical activity on of those days		
0-60 minutes	13	21.7
1-2 hours	13	21.7
3-4 hours	4	6.7
5-6 hours	1	1.7
Total	31	51.7

Table 5: How many days participants walked at least 10 minutes at a time in a week and time spend by walking on of those days.

Maximum participants walked 6-7 days at least 10 minutes at a time and their percentage is 41.7% (n=25). They spend maximum 0-60 minutes by walking on of those day and their percentage is 31.7% (n=19).

Variable	Frequency	Percent
During the last7 days participants walked at least 10 minutes at a time		
2-3 days	2	3.3
4-5 days	18	30.0
6-7 days	25	41.7
not a single day	15	25.0
Total	60	100
Time spend by the participants walking on of those days		
0-60 minutes	19	31.7
1-2 hours	16	26.7
3-4 hours	9	15.0
5-6 hours	1	1.7
Total	45	75

4.1.5 Time spend every day by sitting

In this bar chart we can see that maximum participants were **not sure** how much time they spend sitting every day and their percentage is 33.3% (n=20). Minimum participants were spend 4-5 hour by sitting every day and their percentage is 8.3% (n=5).
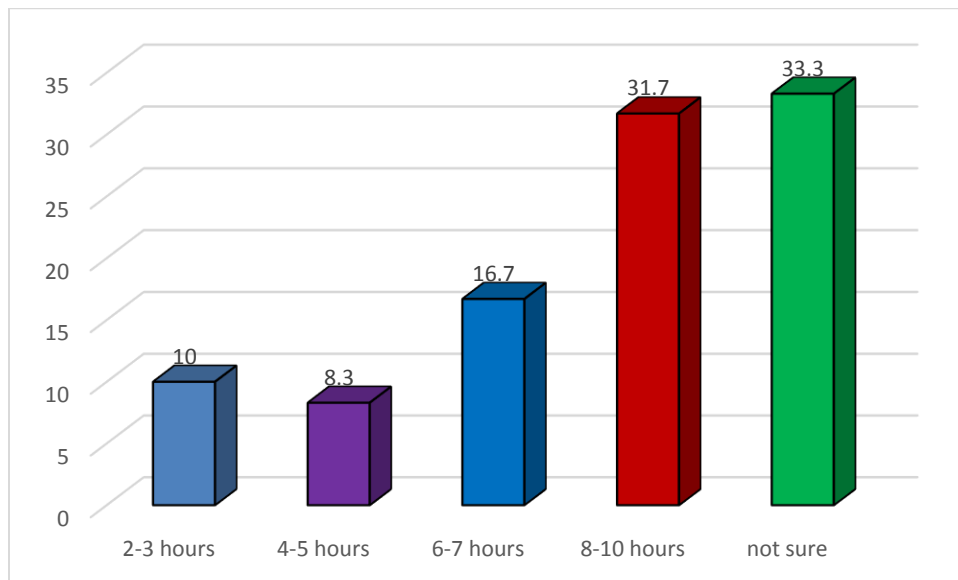

Fig 5: Time spend every day by sitting

Table 6: Distribution of the respondents of association between various components of questionnaire.

Association between contents	Chi-square	P value	Significance
1. Age and vigorous level of physical activity	35.832	.003	significant
2. Age and moderate level of physical activity	21.604	.042	significant
3. Class and weight of school bag	15.99	.191	Non-significant
4. Age and weight of the participants	60.916	.000	significant
5. Gender and vigorous level of physical activity	2.327	.676	Non-significant
6. Gender and moderate level of physical activity	7.122	.058	significant
7. Class and vigorous level of physical activity	42.042	.000	significant
8. Class and moderate level of physical activity	26.988	.008	Significant
9. Weight of participants and respiratory rate	11.075	.352	Non-significant
10. Class and consider them self as physical active person	15.862	.003	significant

From Table-5.1 the observed Chi-square value was 35.832 and 5% level of significant state chi-square was .003 which is less than the observed chi-square value. The result was significant.so there was significant association between age and vigorous level of physical activity

From Table-5.2 the observed Chi-square value was 21.604 and 5% level of significant state chi-square was .042 which is less than the observed chi-square value. The result was significant.so there was strong association between age and moderate level of physical activity

From Table-5.6 the observed Chi-square value was 7.122 and 5% level of significant state chi-square was .058 which is less than the observed chi-square value. The result was significant.so there was strong association between gender and moderate level of physical activity

From Table-5.7 the observed Chi-square value was 42.042 and 5% level of significant state chi-square was .000 which is less than the observed chi-square value. The result was significant.so there was strong association between class and vigorous level of physical activity

From Table-5.9 the observed Chi-square value was 11.075 and 5% level of significant state chi-square was .352 which is more than the observed chi-square value. The result was non- significant.so there was no strong association between weight of participants and respiratory rate

From Table-5.10 the observed Chi-square value was 15.862 and 5% level of significant state chi-square was .003 which is less than the observed chi-square value. The result was significant. So there was strong association between Class and consider them self as physical active person.

CHAPTER –V: **DISCUSSION**

The aim of the study is to find out the level of physical activity among school going children with cerebral palsy.

In this study total participants was 60. Among them maximum participants was age range 11-15 and percentage was 47% (n=28). In this study Participants from minimum age range was 16-20 and percentage was 9.7 % (n=6). From class maximum participant was from class 2 and percent was 25.0% (n=15).Minimum participants was from class 5 and percentage was 15.0% (n=9). Height range of maximum participants was 4.1-4.5 feet and percentage was 38.3 % (n=23) minimum range of height was 5.6-6 feet and percentage was 3.3% (n=2). In this research the most participant was boy. Participants range was 63.3% (n=38). The maximum range of weight from participants was 21-30 kg and percentage was 40% (n=24). In this study it is also found that most participants was boy and their frequency 38 and percentage was 63.3 %. Whereas girl participant was 22 among 60 participants and their percentage was 36.7 %.

In another study it is found that their total participant was 100 and their maximum participants among age range 13-15 and there percentage was 50%. And minimum age range age range was 17-20 and percentage was 8.7 %. In their study participants was from class 1 to class 5. Height range of maximum participants was 4 feet and their percentage was 40% and minimum percentage of height was 3%. This study we found that among 100 participants 55 participants was boy and their percentage was 52.3%. (Zwier J. N. et al., 2010).

In this study participants attend from class 1 to class 5. And it is found that most participants was from class 2 and their frequency was 15 and percentage was 25.0%. And lowest participant was from class 5 and their frequency was 9 and percentage was 15%.and from class 1 and 3 there was equal participants. Their number was 11. This study shows that the maximum participants was weight range between 21-30 kg and their percentage is 40% where frequency 24. The lowest participants was weight range between 0-10 kg and percentage was 1.7% (n=1). Another study shows that most

participants was from class 1 and frequency was 13 and percentage was 21%. And lowest participants was from class 5 and their frequency was 7 and percentage was 11. (Tollerz L.B., et al., 2015)

In this research we can see that most of the participants has knowledge about physical activity and its percentage is 61.7% (n=37). 75.0% (n=45) participants consider their as a physically active person. Other study shows that most of the participants don't have knowledge about physical activity and it's percentage was 60%.(n= 40). Few sudents concider their as a physically active person .and their percntage was 30%.(Rabani A.S.,et all., 2014) All participants have sports facility and playground in their school and 83.3% (n=50) participants Belong to the academic sports association. A study shows that not all participants had not enough facility and playground in their school and their percentage was accordingly 68% and 52%. (Alvarez, N., et al., 2013). 56.7% (n=34) participants had no interest of doing any physical activity. 65.0% (n=39) participants had barrier to do physical activity. 55.0% (n=33) participants was not able carrying of school bag. 63.3% (n=38) participants classroom was in ground floor. And 55.0% (n=33) participants was not able to carrying their schoolbag to the classroom.

A study shows that about 60% (n=71) participants had no interest of doing physical activity. And most of the participant was unable to carry their school bag. Most of the participant's bag's weight range was 2-3 kg. Total participants of this study was 150. (Lauruschkus K. et al., 2017)

This study found that among 60 participants maximum 70.0% (n=42) didn't work any vigorous physical activity for not a single day. And only 1.7% (n=1) did vigorous physical activity 1 day in a week that was the minimum score & Another American study reported that among 111 participants 80% (n=88.8%) didn't work any vigorous physical activity and about 4.5% (n=5%) students did vigorous activity 1-2 days in a week. (Zwier J. N., et al., 2010).

This study found that among 60 participants maximum 48.3% (n=29) didn't work any moderate physical activity for not a single day. And participants 23.3% (n=14) did moderate physical activity for 6-7 days. Maximum 120 minutes time spend for doing

moderate physical activity on of those days. Another study from vu university of Netherlands found that about 55% (n=58) didn't work any moderate physical activity. Participants did 32.5% (n=36) moderate physical activity for 6-7 days. They spend maximum 115 minutes for doing moderate physical activity. (Eck M.V., et al., 2016)

This study found that Maximum participants walked 6-7 days at least 10 minutes at a time and their percentage is 41.7% (n=25). They spend maximum 0-60 minutes by walking on of those day and their percentage is 31.7% (n=19). Another study reported that 48% (n=45) participants walked at least 10 minutes at a time in 6-7 days a week. And they spend 60-70 minutes by walking one of those days. (Rabani A. S. et al., 2014).

In this study it's found that age, class, gender were significantly associated with vigorous & moderate levels of physical activity for children with CP. Where another study showed that Children with cerebral palsy had significantly lower daily AEE, as measured by accelerometers, than the controls, and they did not achieve the healthy moderate to heavy Physical activity level. (Tollerz L. B., et al., 2015)

5.1 Limitations

The main limitation of the study was it was impossible to be extremely accurate. As it is a school based study, so children who are going to school they only get access to be sample for the study. But school-based research does not reach children who are not in school. As my participants were CP children so some participants was not able to give proper information about their level of activity. There are very few special need school in our country for CP children. That's why it was difficult to take enough data from the CP children. Some participants was not able to understand the question due to their intellectual problem. Some of participant's parent was not co-operative during taking data. Research schedules were enforced by the school timetable, school holidays and examinations. Absence of children due to illness may cause of difficulty in data collection by which more time was needed in completing data collection.

| CHAPTER –VI: | CONCLUSION AND RECOMMENDATION |

6.1 Conclusion

Cerebral palsy is considered to be a non-life-threatening condition when the children born with the exception in severe case. In adulthood, most of the children with cerebral palsy are expected to live well. The idea of the study was to identify the level of physical activity among school going children with cerebral palsy. The level of physical activity of the cerebral palsy students was very low. Children with CP are insufficiently physically active. This is particularly important because children with CP are already at a disadvantage with respect to the acquisition of adequate levels of physical functioning, since bones, muscles and the cardiorespiratory system are not fully developed in these children. The main finding of this study is that young children with CP have insufficient physical activity.

Children with cerebral palsy had significantly lower daily AEE and they did not achieve the healthy moderate to heavy physical activity level.

Most of the students didn't have knowledge about benefit of physical activity and two-third students were inactive. They did not participate in any sports in their leisure times & did not fulfill the recommended daily physical activity. They did not use their knowledge in health benefits and in keeping themselves healthy. The boys were the group of highest doing physical activity. There were some barriers for what a great percentage of students were physically inactive. Most of the inactive students had barriers like physical abnormality. Most of the students was unable to do vigorous level of physical activity. Very few students was able to do moderate level of physical activity. A large number of students walked minimum 10 minutes every day.

The sitting time of the students were high and some of the students of being interested in physical activity, there should take measure to overcome barriers of the students. There should create awareness programs, sports facilities, playground to involve students in regular physical activity.

6.2 Recommendation

There have lack of enough resource about the level of activity among school going children with cerebral palsy. So these studies are recommended below:

The aim of the study was to find out the level of physical activity among school going children with cerebral palsy. Further research would be between large groups of CP school going students.

Further research would be to find out level of physical activity among the all age's and all class of students.

Further research would be to find out the level of physical activity of cerebral palsy children those are not going to school.

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Appendix – I

Ref:

CRP-BHPI/IRB/10/18/1258

Date: 20/16/2018

To
S.M. Maruf Hosaain Sajib
B.Sc. in Physiotherapy,
Session: 2013-2014, Student ID:112130211
BHPI, CRP, Savar, Dhaka-1343. Bangladesh.

Subject: Approval of the thesis proposal "**Level of physical activity among school going children with cerebral palsy**" by ethics committee.

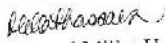Dear, S.M.Maruf Hossain Sajib,
Congratulations.
The Institutional Review Board (IRB) of BHPI has reviewed and discussed your application to conduct the above mentioned dissertation, with yourself, as the Principal investigator. The Following documents have been reviewed and approved:

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

The purpose of the study is to find out the Level of physical activity among school going children with cerebral palsy .The study involves use of a semi structured and short form version of International Physical Activity Questionnaire (IPAQ) to explore the result 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 11 AM on 24th January, 2018 at BHPI.

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

Muhammad Millat Hossain
Assistant Professor, Dept. of Rehabilitation Science
Member Secretary, Institutional Review Board (IRB)
BHPI, CRP, Savar, Dhaka-1343, Bangladesh

Appendix – II

CONSENT STATEMENT

Assalamualaikum,

I am S. M. Maruf Hossain Sajib. I am conducting this study for 4th professional B.sc in Physiotherapy project study dissertation titled **"Level of physical activity among school going children with cerebral palsy".** By this I would like to know about level of physical activity among school going children with cerebral palsy. Now I want to ask your children some personal and workplace related question. This will take approximately 15-20 minutes.

I would like to inform you that this is a purely academic study and will not be used for any other purpose. All information provided by your children will be treated as confidential and in the event of any report or publication it will be ensured that the source of information remains anonymous.

Your children's participation in this study is voluntary and they may withdraw themselves at any time during this study without any negative consequences. They also have the right not to answer a particular question that they don't like or do not want to answer during interview.

If you have any query about the study or their right as a participant, you may contact with my supervisor Muhammad Millat Hossain, Assistant professor, department of rehabilitation science, BHPI, CRP, Savar, Dhaka-1343.

Do you have any questions before I start?

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

Yes ☐ No ☐

Signature of the participant's parent and date _____

Signature of the Data collector and date _____

Signature of the researcher and date_____

সম্মতিপত্র

আসসালামুয়ালাইকুম / নমস্কার,

আমি এস এম মারুফ হোসেন সজীব, আমি বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউট (বিএইচপিআই)-এর একজন ছাত্র। আমি এই গবেষণা প্রকল্পটি বাংলাদেশ হেলথ প্রফেশনস ইনস্টিটিউট (বিএইচপিআই)-এ পরিচালনা করছি যা ঢাকা বিশ্ববিদ্যালয়ের অধিনে আমার ৪র্থ বর্ষ বিএসসি ইন ফিজিওথেরাপী কোর্সের অধিভুক্ত। আমার গবেষণার শিরোনাম **"সেরেব্রাল পালসিতে আক্রন্ত বিদ্যালয়গামী ছাত্রছত্রীদের শারীরিক পরিশ্রমের মাত্রা"**। এর মাধ্যমে আমি সেরেব্রাল পালসিতে আক্রন্ত বিদ্যালয়গামী ছাত্রছত্রীদের শারীরিক পরিশ্রমের মাত্রা সম্পর্কে জানতে চাই। আমি এখন আপনার সন্তানকে কিছু ব্যক্তিগত এবং কর্মস্থল সম্পর্কে আনুষাঙ্গিক কিছু প্রশ্ন করতে চাচ্ছি। এতে আনুমানিক ১০-১৫ মিনিট সময় নিবে।

আমি আপনাকে অবগত করছি যে, এটা আমার অধ্যয়নের অংশ এবং যা অন্য কোন উদ্দেশ্যে ব্যবহৃত হবে না। আপনার সন্তান যেসব তথ্য প্রদান করবেন তার গোপনীয়তা বজায় থাকবে এবং আপনার প্রতিবেদনের ঘটনা প্রবাহে এটা নিশ্চিত করা হবে যে এই তথ্যের উৎস অপ্রকাশিত থাকবে।

এই অধ্যয়নে আপনার সন্তানের অংশগ্রহণ স্বেচ্ছাপ্রণোদীত এবং আপনার সন্তান এর জন্য কোনো পারিশ্রমিক পাবেন না,আপনার সন্তান যেকোন সময় এই গবেষণা থেকে কোন নেতিবাচক ফলাফল ছাড়াই নিজেকে প্রত্যাহার করতে পারবেন।এছাড়াও কোন নির্দিষ্ট প্রশ্ন অপছন্দ হলে উত্তর না দেয়ার এবং সাক্ষাৎকারের সময় কোন উত্তর না দিতে চাওয়ার অধিকারও আপনার আছে।

এই অধ্যয়নে অংশগ্রহণকারী হিসেবে যদি আপনার কোন প্রশ্ন থাকে তাহলে আপনি আমাকে অথবা আমার সুপারভাইজার মোঃ মিল্লাত হোসাইন,সহকারী অধ্যাপক,রিহ্যাবিলিটেশন সাইন্স বিভাগ,বিএইচপিআই, সিআরপি, সাভার, ঢাকা-১৩৪৩ তে যোগাযোগ করতে পারেন।

সাক্ষাৎকার শুরু করার আগে কি আপনার কোন প্রশ্ন আছে ?

সুতরাং আমি আপনার অনুমতিতে এই সাক্ষাৎকার শুরু করতে পারি ?

হ্যাঁ ☐   না ☐

১। অংশগ্রহণকারীর পিতা/মাতার স্বাক্ষর ও তারিখ_____

২। উপাত্ত সংগ্রহকারীর স্বাক্ষর ও তারিখ _____

৩। গবেষকের স্বাক্ষর ও তারিখ_____

Appendix – III

Title: "Level of physical activity among school going children with cerebral palsy"
<u>**Questionnaire**</u>

Part 1: Socio-demographic information.

1.1 Name: ……

1.2 Identification number: …..

1.3 Age: ……

1.4 Sex:

- Male……
- Female…….

1.5 Name of subject………………

1.6 Name of educational institute ……………….

1.7 Height …………….

1.8 Weight…………….

Part 2:

2.1 Do you have any knowledge about physical activity?

Yes/ no

2.2 Do you consider yourself as physically active person?

Yes/ no

2.3 Do you have any playground in your university?

Yes/no

2.4 Do you have any sports facilities at your university?

Yes/no

2.5 Do you belong to the academic sports association?

Yes/ no

2.6 Are you interested of doing physical activity?

Yes/no

2.7 Do you have any barrier to do physical activity? If yes, what is that?

Yes ……….

No

2.8 Heart rate during rest?

1. 70-80   2. 81-90   3. 91-100   4. 101-110   5. 111-120

2.9 Respiratory rate during rest?

1. 15-20   2. 21-25   3. 26-30   4. 31-35   5. More

2.10 Do students carry their bag themselves?

1. Yes   2. No

2.11 Which is the class room at?

1. Ground floor   2. 1st floor   3. 2nd floor   4. 3rd floor   5. Above

2.12 Do you carry school bag yourself?

1. Yes   2. No

2.13 How much the school bag weighs?

1. 0-1 kg   2. 1.5-2.5 kg   3. 3-4 kg   4. 4.5-5.5 kg   5. More

Part 3: Short last 7 days self-administered format

The questions will ask you about the time you spent being physically active in the last 7 days. Please answer each question even you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sports.

Think about all the vigorous activities that you did in the last 7 days. Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3.1: During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, any heavy task, aerobics, or fast bicycling?

1. 0-1 day   2. 2-3 days   3. 4-5 days   4. 5-6 days   5. Not a single day

If you do advance for next question

3.2: How much time did you usually spend doing vigorous physical activities on one of those days?

       1. 0-60 min   2. 1-2 hours   3. 3-4 hours   4. 5-6 hours   5. Not sure

Think about all the moderate activities that you did in the last 7 days. Moderate physical activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3.3 During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

       1. 0-1 day   2. 2-3 days   3. 4-5 days   4. 6-7 days   5. Not a single day

If you do advance for next question

3.4: How much time did you usually spend doing moderate physical activities on one of those days?

       1. 0-60 min   2. 1-2 hours   3. 3-4 hours   4. 5-6 hours   5. Not sure

Think about the time you spent walking in the last 7 days. This includes at work and at home, walking to travel from place to place, any other walking that you have done solely for recreation, sport, exercise, or leisure.

3.5 During the last 7 days, on how many days did you walk for at least 10 minutes at a time?

       1. 0-1 day   2. 2-3 days   3. 4-5 days   4. 6-7 days   5. Not a single day

If you do advance for next question

3.6 How much time did you usually spend walking on one of those days?

       1. 0-60 min   2. 1-2 hours   3. 3-4 hours   4. 5-6 hours   5. Not sure

The last question is about the time you spent sitting on weekdays during the last 7 days. Include time spent at work, at home, while doing coursework and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

3.7 During the last 7 days, how much time did you usually spend sitting on a week day?

       1. 0-60 min   2. 1-2 hours   3. 3-4 hours   4. 5-6 hours   5. Not sure

Thank you for your participation

<u>**প্রশ্নপত্র**</u>

"সেরেব্রাল পালসিতে আক্রান্ত বিদ্যালয়গামী ছাত্রছাত্রীদের শারীরিক পরিশ্রমের মাত্রা"

অংশ-১ঃ ব্যক্তিগত তথ্য

১.১ নামঃ

১.২ কোড নংঃ

১.৩ বয়সঃ

১.৪ লিঙ্গঃ

      ১. ছেলে

      ২. মেয়ে

১.৫ অধ্যয়নরত শ্রেণিঃ

১.৬ শিক্ষা প্রতিষ্ঠানের নামঃ

১.৭ উচ্চতাঃ

১.৮ ওজনঃ

অংশ -২

২.১ শারীরিক পরিশ্রমের উপকারিতা সম্পর্কে আপনার কি কোন ধারণা আছে?

      ১.হ্যাঁ   ২.না

২.২ আপনি কি নিজেকে শারীরিক ভাবে কর্মঠ মনে করেন?

      ১.হ্যাঁ   ২.না

২.৩ আপনার বিদ্যালয়ে কি খেলাধুলা করার কোন ব্যবস্থা আছে?

      ১.হ্যাঁ   ২.না

২.৪ আপনার বিদ্যালয়ে কি কোন খেলার মাঠ আছে?

      ১.হ্যাঁ   ২.না

২.৫ আপনি কি একাডেমিক ক্রীড়া সংস্থার সাথে জরিত?

> ১.হ্যাঁ   ২.না

২.৬ আপনি কি শারীরিক পরিশ্রম করতে আগ্রহী?

> ১.হ্যাঁ   ২.না

২.৭ আপনার কি শারীরিক পরিশ্রমে কোন প্রতিবন্ধকতা আছে বলে মনে করেন? থাকলে কি প্রতিবন্ধকতা?

> ১.হ্যাঁ....................
>
> ২. না

২.৮ বিশ্রামের সময় হার্ট রেট

> ১. ৭০-৮০ ২.৮১-৯০ ৩.৯১-১০০ ৪.১০১-১১০ ৫.১১১-১২০

২.৯ বিশ্রামের সময় শ্বাস–প্রশ্বাসের রেট

> ১. ১৫-২০ ২. ২১-২৫ ৩. ২৬-৩০ ৪. ৩১-৩৫ ৫. আরও বেশি।

২.১০ স্কুল ব্যাগ কি ছাত্র-ছাত্রী নিজে বহন করে?

> ১.হ্যাঁ   ২.না

২.১১ শ্রেণী কক্ষ কত তলায়?

> ১. নিচ তলা ২. ১ম তলা ৩.২য় তলা ৪. ৩য় তলা ৫. আরও উপরে

২.১২ স্কুল ব্যাগ কি নিজে শ্রেণী কক্ষে বহন করে নিয়ে যান?

> ১.হ্যাঁ   ২.না

২.১৩ স্কুল ব্যাগের ওজন কত?

> ১. ০-১ কেজি ২. ১.৫-২.৫ কেজি ৩. ৩-৪ কেজি ৪. ৪.৫-৫.৫ কেজি ৫. আরও বেশি।

অংশ-৩ গত সাত দিনের শারীরিক পরিশ্রম এর নমুনা

গত ৭ দিনে আপনি কতটুকু সময় শারীরিক পরিশ্রম করেছেন তা সম্পর্কে আপনাকে প্রশ্ন জিঙ্গাসা করা হবে ।আপনি পরিশ্রমী ব্যক্তি না হলেও অনুগ্রহপূর্বক প্রত্যেক প্রশ্নের উত্তর দিবেন ।অনুগ্রহপূর্বক ঐ কাজগুলো ভাবেন যেসব কাজ আপনি বিভিন্ন জায়গা ভ্রমন করতে,ঘরে বইরে এবং আপনার বিনোদের সম্য,পরিশ্রম অথবা খেলাধুলা করতে করে থাকেন।

গত ৭ দিনে আপনি যেসব কঠোর পরিশ্রমের কাজ করেছেন তা ভাবেন।কঠোর পরিশ্রমের কাজ বলতে ঐসব কাজ বুঝায় যা করতে অনেক বেশি শক্তি লাগে এবং সাধারণের চেয়ে অনেক জোরে শ্বাস নিতে হয়।যেসব পরিশ্রম আপনি একবারে ১০ মিনিট করেন।

৩.১ গত ৭ দিনে আপনি কতদিন কঠোর শারীরিক পরিশ্রম যেমন, ভারী ওজন তোলা,ভারী কোন কাজ করেছেন?

১. ০-১ দিন ২. ২-৩ দিন ৩. ৪-৫ দিন ৪. ৬-৭ দিন ৫. একদিন ও না।

যদি করে থাকেন ৩.২ নং প্রশ্নে চলে যান।

৩.২ ঐ দিনগুলোর ১ দিনে আপনি কতটুকু সময় কঠোর পরিশ্রম করেছেন?

১. ০-৬০ মিনিট ২. ১-২ ঘন্টা ৩. ৩-৪ ঘন্টা ৪. ৫-৬ ঘন্টা ৫. নিশ্চিত না

গত ৭ দিনে আপনি যেসব মধ্যমশ্রেণীর পরিশ্রমের কাজ করেছেন তা ভাবেন।মধ্যমশ্রেণীর পরিশ্রমের কাজ বলতে ঐসব কাজ বুঝায় যা করতে অনেক মধ্যম শক্তি লাগে এবং সাধারণের চেয়ে অনেক জোরে শ্বাস নিতে হয়।যেসব পরিশ্রম আপনি একবারে ১০ মিনিট করেন।

৩.৩ গত ৭ দিনে আপনি কতদিন মধ্যমশ্রেণীর শারীরিক পরিশ্রম যেমন,হালকাওজন তোলা,হালকা কোন কাজ করেছেন?এখানে স্বাভাবিক হাঁটা অন্তভুক্ত নয়।

১. ০-১ দিন ২. ২-৩ দিন ৩. ৪-৫ দিন ৪. ৬-৭ দিন ৫. একদিন ও না।

যদি করে থাকেন ৩.৪ নং প্রশ্নে চলে যান।

৩.৪ ঐ দিনগুলোর ১ দিনে আপনি কতটুকু সময় মধ্যমশ্রেণীর পরিশ্রম করেছেন?

১. ০-৬০ মিনিট ২. ১-২ ঘন্টা ৩. ৩-৪ ঘন্টা ৪. ৫-৬ ঘন্টা ৫. নিশ্চিত না

গত ৭ দিনে আপনি যতটুকু সময় হেঁটেছেন তা ভাবেন।যেমন, বাড়িতে বিভিন্ন জায়গা ভ্রমন করতে,এবং আপনার বিনোদনের সময়,খেলাধুলা,পরিশ্রম অথবা অবসর সময় হাঁটেন।

৩.৫ গত ৭ দিনে আপনি কতদিন অন্তত একবারে ১০ মিনিট হেঁটেছেন?

১. ০-১ দিন ২. ২-৩ দিন ৩. ৪-৫ দিন ৪. ৬-৭ দিন ৫. একদিন ও না।

যদি করে থাকেন ৩.৬ নং প্রশ্নে চলে যান।

৩.৬ ঐ দিনগুলোর ১ দিনে আপনি সাধারণত কতটুকু সময় হেঁটেছেন?

১. ০-৬০ মিনিট ২. ১-২ ঘন্টা ৩. ৩-৪ ঘন্টা ৪. ৫-৬ ঘন্টা ৫. নিশ্চিত না

শেষ প্রশ্ন হল গত ৭ দিনে আপনি যতটুকু সময় বসে কাটিয়েছেন যেমন, কোন কাজে , বাড়িতে হোমওয়ার্ক করতে ব্যয় করেছেন।সময়গুলো ডেস্কে বসে,বন্ধুদের সাথে,পড়াশুনা করতে অথবা শুয়ে/বসে,টেলিভিশন দেখে কাটিয়েছেন।

৩.৭ গত ৭ দিনে আপনি প্রতিদিন কতটুকু সময় বসে কাটিয়েছেন?

১. ২-৩ ঘণ্টা ২. ৪-৫ ঘন্টা ৩. ৬-৭ ঘন্টা ৪. ৮-১০ ঘন্টা ৫. নিশ্চিত না

<u>Permission letter</u>

July 21, 2018

Principal,

William and Marie Taylor school,

CRP, Savar, Dhaka – 1343.

Through: Head, Department of Physiotherapy, BHPI.

Subject: Permission to collect data in order to conduct my research project.

Dear sir,

With due respect and humble submission to state that I am S M Maruf Hossain Sajib, student of 4th professional B.Sc. in physiotherapy at Bangladesh Health Professions Institute(BHPI). According to the course curriculum, I have to conduct a research project for the partial fulfillment of the degree of B.Sc. in Physiotherapy.The title of my research project is "Level of physical activity among school going children with cerebral palsy". My research project will be conducted under the supervision of Muhammad Millat Hossain, Assistant Professor, dept. of rehabilitation science, BHPI, CRP, Savar. I want to collect data for my research project from the students of William and Marie Taylor school, CRP, Savar. So, I need permission for data collection from the William and Marie Taylor school, CRP, Savar. I would like to assure that anything of my study will not be harmful for the participants.

I, therefore, pray and hope that you would be kind enough to grant my application and give me permission for data collection and oblige thereby.

Yours Sincerely,

S. M. Maruf Hossain Sajib

S.M. Maruf Hossain Sajib

4th Professional B.Sc. in physiotherapy

Roll- 16, Session: 2013-2014

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343.