

**MOTHERS' PERCEPTION IN CHANGES OF HAND SKILLS  
PATTERN OF THEIR CHILDREN WITH CEREBRAL PALSY TO  
PERFORM ACTIVITIES OF DAILY LIVING: INDOOR  
PAEDIATRIC UNIT, CRP**

**Md. Yeasir Arafat Alve**

4<sup>th</sup> Year, B. Sc. in Occupational Therapy

The University of Dhaka

This thesis is submission in total fulfillment of the requirements for the subject RESEARCH 2 & 3 and partial fulfillment of the requirement for the degree:

Bachelor of Science in Occupational Therapy  
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**March' 2012**

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## Statement of authorShip

Except where is made in the text of the thesis, this thesis contains no materials published elsewhere or extracted in whole or in part form a thesis presented by me for any other degree or diploma or seminar.

No others person's work has been used without due acknowledgement in the main text of the thesis.

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The ethical issues of the study has been strictly considered and protected. In case of dissemination the finding of this project for future publication, it will be duly acknowledged as undergraduate thesis.

I am only responsible for any imprecision or mistake on my research study.

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Dedication

*Dedicated to my honorable  
and beloved parents and  
little sister.*

## List of abbreviations

ADLs- Activities of daily living

BHPI- Bangladesh Health Professions Institute

CP- Cerebral Palsy

CRP- Centre for the Rehabilitation of the Paralysed

NINDS- National Institute of Neurological Disorders and Stroke

NGOs- Non Govern Organizations

PWD- Person with disabilities

OT- Occupational therapist

UN- United Nations

US- United States

WHO- World Health Organization

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# Abstract

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Hand skills pattern is an important part for completing functional performance and occupational therapy treatments based on daily living performance. The children with cerebral palsy have a problem in extremity like- upper or lower or both. So, the children face difficulties in their hand skills pattern due to abnormal tone, balance and coordination and cannot perform daily activities independently like normal children. The Cerebral Palsy children receive treatment from indoor pediatric unit, CRP but the therapists do not evaluate the mothers' understanding about their children hand skills pattern due to limited time or anything else. Researcher wants to know about whether the hand skills pattern has been really changed or not to perform any ADLs. This study attempts to know the mothers' opinions and evaluations towards hand skills performance of their cerebral palsy children after completing indoor program CRP, Savar. The objectives are to find out the mother understanding about Occupational therapy intervention as well as to explore the performance of cerebral palsy children by hand skills pattern in relation with daily living activities after completing 14 days indoor program. This study has been conducted by using qualitative content analysis. The data have been collected through semi-structural interviews. Ten participants are selected by using purposive comprehensive sampling from inpatient pediatric unit. Data was analyzed by using content analysis. From the findings of the research, it is seen that mothers of Cerebral Palsy children have a good understanding about occupational therapy after ending of the program that was absent in them before taking the program. They feel realistic changes in their children hand skills pattern and think that the small tasks or different hand skills pattern influence their children's daily living performance significantly. To make the mothers understand better therapists should explain about the effects of playing with different toys and grasp, and also link these components with activities of daily performance. Overall the program is really effective for the children with cerebral palsy.

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**Key words:** *Cerebral palsy, Hand skill patterns, ADLs performance & Indoor pediatric unit CRP.*



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### **1.1. Introduction**

Bangladesh is a country who achieved its independence in the year 1971. It lies in the northeastern part of south Asia. It has an extremely high populated density (about 156 million people living in an area of 147 570 sq. km), a low resource base (poverty), suffers frequent natural disasters, and is already feeling the brunt of climate change (Save the children, 2011). Between 2 and 4 people out of every 100 have really severe disabilities. A Disability percentage of Bangladesh said that in age group (0-4) is 5.2%, in age group (5-9) is 9.8% and in age group (10+) is a 9.9% person with disabilities. If those percentages are applied to the 2004 UN/WHO statistics, the total numbers of disabled Bangladesh children, age's birth to ten is 3,153,886, or 7.7% of the population of that age (Ackerman, P et al. 2005, p. 3). Disability does not just affect an individual but the whole family and community around the individual. It is estimated that the lives and livelihoods of about 800 million people or about 25% of the population in the Asia-Pacific region are affected by disability in the family. The children with severe disability are 8.2% from total disability and among them about 36% cognitive, 27% speech, 18% hearing, 9% movement, 7% vision and 2% epilepsy. Cerebral palsy is a condition which experienced the children with disability. It is one of the most common conditions which are to be noticed among the children in rural and urban area. The prevalence of cerebral palsy in Bangladesh is 4157 person among 141,340,476 people and the rate is 0.003% among the whole population. Our neighbor country India has cerebral palsy people about 31,325 among the total 1,065,070,607 population. Their CP rate is 0.004% (US Census Bureau, 2004). The incidence of CP is higher in males than in females; the Surveillance of CP in Europe reports a Male: Female ratio of 1.33:1. In the United States, approximately 10,000 infants and babies are diagnosed with CP in each year, and 1200–1500 are diagnosed at preschool age (Evoy, K, 1995).

Normally children represent different hand skills pattern in their developmental age. So, this hand impairment includes slowness, weakness, uncoordinated movements incomplete finger fractionation and spasticity (Eliasson, AC et al. 2011, p. 1227). CP is a condition where the children face developmental delay through their hand skills. Occupational therapist provides treatment for children with disable to develop motor

skills. Occupational therapy services are inadequate in some regions that only 12% of CP children are supported by educational and therapy services and 26% do not even receive any services (Choi, K & Hunglo, K 201, p. 1704). Occupational therapists work to achieve hand skills for facilitating functional activities which helped the children to perform feeding, dressing, toileting etc. (Clancy & Clark, 1990). Certified hand therapist as well as OT provides hand therapy services for maximizing their functions of hand which facilitate to develop normal hand skills pattern.

## **1.2. Background**

In cerebral palsy children, eight children died: two of 49 (4%) from an urban area and six of 43 (14%) from a rural area. (Collingwood, J 2007, Cerebral Palsy Rate Beginning To Fall) Cerebral palsy is common disability condition in Bangladesh. Total number of children with cerebral palsy in Bangladesh is 2.8 million among 144,109,214 populations (US census Bureau 2007 cited in statistics by country from cerebral palsy, 2009). Cerebral palsy is one of the most common causes of chronic childhood disability, with a frequency of 1.4-2.7/ 1000 of live births (Tabib, SMSB 2009). The ability to use our hands is crucial in order to achieve the goals of almost all activities in everyday life. Many activities require that we are able to handle objects that are fragile and/or can change shape in response to compression forces, like an egg or the stem of a flower. This means that we risk to damage or break the object if the grip forces applied to the surface of the object are too high. If we consider the opposite, applying too little force so as to be on the safe side not to squeeze too hard, we risk that the object slips and is dropped. Most of us learn how to handle objects and adjust our hand and finger movements to perform increasingly difficult tasks during childhood and adolescence. So, hand function is very essential for the children in developmental stages (Holmstrom, L 2011). Various methodologies have been used for the evaluation of hand functions in children with CP. Some methods are oriented towards daily-life activities. For instance, parents might complete questionnaires, with lists of daily activities involving the hands (dressing, eating, involving tools etc.). Investigators might use experimental devices (like ball, pencil etc.) in children with CP to analysis the hand skills pattern. Annett (1973) said, to assess hand function and to examine the hand skills pattern with relation of cognitive functioning (Annett, M, & Kilshaw, D 1983). During hand therapy sessions, researcher has found that the children who are diagnosis as CP have



major or minor problem in their hand skills pattern. They cannot perform activities of daily living due to their major hand skills problem. When therapists worked with CP children most of the cases are representing hyper tonicity on upper extremity. So they cannot perform the patterns (Reach, grasp, carry, release, bilateral hand using and in hand manipulation) sequentially. CRP has run a group just for two weeks in indoor Paediatric unit. Researcher is confused about the mothers are really introduced with the sequential pattern for their children and how it is necessary for their children to perform ADLs. So researcher is curious to find out mothers' opinion about their children hand skills pattern for performing ADLs but still now have lacking to find out mothers' perspective on that. Till now no researcher has been conducted to find out mother perception on Occupational therapy for their children with CP having problem in hand skills pattern.

### **1.3. Significant**

The aim of the study is to find out the mothers' perception towards their children hand skills pattern after completing indoor program from CRP. Hand therapy is a part of occupational therapy intervention for improving hand skills pattern. Hand skills pattern develop sequentially in childhood and it is necessary to develop hand skills pattern for performing any ADL. By performing each pattern of hand the children can engage self in any kind of activity. Children with CP whose have developmental delay and also present abnormal tone in extremity could not perform ADLs. They have difficulties in hand skills pattern. In CRP the mothers and their CP children stay for 14 days indoor program and they take treatment from occupational therapy along with others professions. Occupational therapists are worked with these types of children to improve hand skills pattern but they are not known about the mother understanding of OT intervention. So, after doing this study mother will give concentration towards their children hand skills pattern. They will facilitate and provide supports to develop normal patterns of their children. They will understand the intervention and can continue those therapies in home. So the mothers and their children will be benefited by this study. Occupational therapist will keep concentration on hand skills pattern during ADLs training and they will clarify it to the mothers after doing this study. It is necessary for an Occupational therapist to understand mothers' perception because if the mothers think that there are no improvements after 14 days treatment program then therapist would be able to change or modify their hand therapy program or

sessions. That does enhance mothers' perception about OT intervention. After returning back to the community, mothers can motivate their family members about hand therapy program and will take preparation for further therapy from Occupational therapist. So, when mothers come for follow up regularly then the professional will feel competent by their services. The researcher will share the data, information and result with the paediatric occupational therapists, so the study may help the therapists to raise their confidence about their intervention in these challenging health care professions. So other Occupational therapists who worked with another pediatric rehabilitation center could be benefited by this study after sharing this information.

#### **1.4. Cerebral palsy**

Cerebral palsy is one of the most common causes of all birth disorders. Cerebral palsy affects 2 to 2.5 of every 1,000 babies born in developed countries (Smits, D et. al 2010, p. 1)

Cerebral palsy is a group of disorders of the development of movement and posture causing activity limitations that are attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disorder of cerebral palsy is often accompanied by disturbances of sensation, cognition, communication, perception and/or behavior and/or a seizure disorder (Bax 2005 cited in Zeldin 2009).

Cerebral palsy is one of the neurological motor disorders is defined as a disorder of movement and that is caused by a nonprogressive brain lesion that occurs shortly after birth and is expressed in variable impairments in the coordination of muscle action and sensation. Several classification of cerebral palsy has been developed according to the quality of tone, disorder distribution and locale of brain lesion (Li-tsang, CW 2003, p. 100). Children with various types of cerebral palsy face difficulty in their hand skills pattern (Uvebrant cited in Arnould, C et al. 2007, p. 708).

#### **1.5. Classification of cerebral palsy**

All children with cerebral palsy have damage to the area of the brain that controls muscle tone. As a result, they may have increased muscle tone, reduced muscle tone, or a combination of the two (fluctuating tone). To describe the particular area of the brain which was damaged and the types of movement which are challenged, medical specialists classify cerebral palsy into following categories: (Gershon, Z 2009)

- Spastic type of cerebral palsy

- Athetoid type of cerebral palsy
- Hypotonic type of cerebral palsy
- Ataxic type of cerebral palsy
- Mixed type of cerebral palsy
- Spastic Quadriplegia
- Spastic Diplegia

Spastic type of cerebral palsy is the most common form of the disease, occurs when the brain damage occurs in the outer layer of the brain, the cerebral cortex. It is estimated that this form of CP affects between 70 to 80 percent of children (Gershon, Z 2009). Typical pattern of spasticity in upper limb includes elbow flexion, pronation of the forearm, ulnar deviation and flexion of the wrist with thumb in palm deformity. Due to showing this type of hand skill pattern CP children face difficulty in their activities of daily living (Bobath, cited in Li-tsang, CW 2003, p. 100).

About 10 percent of children have athetoid cerebral palsy. Athetoid cerebral palsy is caused by damage to the cerebellum or basal ganglia. Damage to these areas may cause a child to develop involuntary, purposeless movements, especially in the face, arms, and trunk (French, R 1997– 2004). They also face difficulties during reaching and carrying any object due to involuntary movements. Children face emotional distress due to work hard to bring their hand to carry out anything but can achieve after a heavy try (Gershon, Z 2004).

When one moves the arms and legs of healthy infants they offer a moderate amount of resistance. Conversely, children suffering from hypotonic CP are floppy and look almost like a rag doll. Infants with healthy muscle tone have flexed elbows and knees, hypotonic CP infants rest with their elbows and knees loosely extended. Head control is generally very poor and often falling to the side, backward or forward. It is a condition that could be so severe; the infant may experience difficulty in breathing. So during perform any task they have difficulties in poor eye hand coordination (Gershon, Z 2009).

Ataxic type of cerebral palsy is about 5-10 percent with the whole cerebral palsy children. Low muscle tone and poor coordination of movements is described as ataxic cerebral palsy. Children with ataxic cerebral palsy look very unsteady and shaky. This children have no power in hand to grasp the object and faces difficulties in functional

movement, especially when they are trying to handle or hold a small object such as a pen. Children with ataxic cerebral palsy may take longer than other children to complete certain tasks such as writing a sentence, Deny when need resistance to perform the task (Sheldon, O & Zisook, A).

About ten percent of children with CP are mixed-type cerebral palsy. These children have both the tight muscle tone of spastic cerebral palsy and the involuntary movements of athetoid cerebral palsy. This is because they have injuries to both the pyramidal and extrapyramidal areas of the brain (Sheldon, O & Zisook, A). The frequency of the involuntary movement interferes with their ability to perform otherwise “simple” activities like grasping, reaching, eating and speaking, and similar skills (Gershon, Z 2009).

Quadriplegia is a form of Cerebral Palsy (CP) in which all four limbs are affected, hence the prefix “Quadri.” There are often additional complications having to do with eating and breathing due to the lack of muscle control or the inability of muscles to work together in the normal patterns or rhythms of contraction. Spastic diplegia CP generally affects the legs of a patient more than the arms (Gershon, Z 2009).

## **1.6. Relationship between cerebral palsy children with gross motor skills and fine motor skills**

The different types of Children motor system refer to many parts of our bodies that work together to enable us to act and move. It also helped to complete our activities of daily living. Gross motor skills are skills involving the larger muscles, such as in the arms and legs.

The children with CP have a major problem in gross motor skills. Gross motor capacity can be considered an important basis for movement activities of daily living or daily-life mobility (Smith, D et al. 2010, p. 59). They couldn't maintain their proximal body part, sometime increased/decreased muscle tone in large muscle group. So they could not maintain proper body position, posture and balance (Agneta Fovsstvom, A & Hofsten, C 1982, p. 653). Therapeutic intervention has traditionally focused on improving gross motor capacity and, by this, on improving a child's daily-life mobility in terms of capability and performance (Smits, D et. al. 2010, p. 60). A good gross motor skill facilitates the child's fine motor skill to perform functional task.

Fine motor skills are skills involving the small muscles of hands which enhance the performance of hand skills. These activities include grasping small objects like beads, holding a pencil correctly, cutting and buttoning. It is easy to see how critical fine motor skills are to every area of a child's life! Fine motor skills can directly affect a child's self-esteem and success at school. Cerebral palsy leads to an underdevelopment of the small muscles in the hand. Underdevelopment of these muscles can lead to handwriting difficulties when your child enters school. This type of children faces problem in grasp, carry and release and another hand skills pattern (Palisano, R et. al 2007, pp. 93-97).

## **1.7. Hand skills pattern**

In addition, imitating each of the normal and abnormal movements and patterns described in the following text is helpful in clarifying the descriptions provided.

### **1.7.1. Reach**

Rosblad (1995) states that 'in a reaching movement the goal is transport the hand to the target, with precision in both time and space' (p. 81). However, even within the first several days of life, the infant shows increasing visual regard of objects close to him or her and activation of the arms in response to objects (Von Hofsten, cited in Case-smith 2001, p. 224). Gradually a midline orientation of the hands develops. Initially the hands are held close to the body (Case-smith, J 2001 p. 294). In this research, reach has defined as to take hand near the objects with normal pattern like shoulder flex/abduction and internal rotation and elbow extension/semi flexion. So, it means that to extend the hand for reach something like- pen, ball and glass etc. The children with CP perform this task with abnormal pattern like pronation or wrist drop. It is depending on the proximal stability.

### **1.7.2. Grasp**

*Classification of Grasp:* Napier (1956) Proposed two basic terms to describe hand movements: prehensile and nonprehensile. Nonprehensile movements involve pushing or lifting the objects with the fingers or the entire hand. Weiss and Flatt (1971) described a slightly different method of classification. Grasps with no thumb opposition include hook grasp, power grasp and lateral pinch. The patterns that use thumb opposition include tip and palmar pinches. The palmar pinch category is divided into standard, spherical, cylindrical and disc grasps.

**Hook grasp:** The hook grasp is used when strength of grasp must be maintained to carry objects. The transverse metacarpal arch is essentially flat, fingers are adducted with flexion at the IP joint and flexion or extension occurs at the MCP joints (Weiss and Flatt, cited in Case-smith 200, p. 295). In this research the hook grasp is tested with CP children by asking question like ‘can your baby griping the bag?’ They face difficulties due to spastic tone in hand and could not extend the fingers.

**Power grasp:** The Power grasp is often used to control tools or others objectives. Oblique object placement in the hand, flexion of the ulnar fingers, less flexion with the radial fingers and thumb extension and adduction facilitate precision handling with the grasp. Griping the handle of the brush is a one kind of example of power grasp.

**Lateral pinch:** Lateral pinch is used to exert power on or with a small object. Partial thumb adduction, MCP flexion and slight IP flexion are characteristic of the pattern. Although the index figure is slightly flexed, it is more extended than the other fingers. Griping of the small spoon during feeding is a kind of example of lateral pinch. Most of the children with CP face difficulties in thumb movement due to tone and cannot involve it in performance.

**Tip pinch:** Opposition of the thumb tip and index fingertip, so that a circle is formed describes as tip pinch. All joints of the index figure and thumb are partially flexed. If the children can grip the marble from the floor then tip pinch is ok. Opposition of the thumb simultaneously to the index and middle finger pads, which provides increased stability of prehension, describes three-point pinch (Smith & Benge, cited in Case-smith 2001, p. 296). In this pattern the CP children could not get enough strength in distal part of finger.

**Spherical grasp:** Significant wrist extension, fingers abduction and some degree of flexion at the MCP and IP joints describe spherical grasp. Griping the tennis by using fingers is called spherical grasp.

**Cylindrical grasp:** In cylindrical grasp the transverse arch is flattened to allow the fingers to hold again the object. The fingers are only slightly abducted, IP and MCP joints flexion is graded according to the size of the object.

**Disc grasp:** Fingers abduction that is graded according to the size of the object held, Hyperextension of the MCP joints and flexion of the IP joints describe Disc grasp. By griping the small mirror in hand with normal pattern is an example of disc grasp. The children with CP face difficulty in performance of any task by finger tips.

**Translation:** In hand manipulation includes five basic types' patterns: figure-to-palm translation, palm-to-finger translation, shift, simple rotation and complex rotation. All skills require the ability to control the arches of the palm. By performing the activity like pick up the coin from the ground is an example of figure to palm translation.

**Bilateral hand skills:** It is another pattern of hand skills. The normal infants progress from asymmetry to symmetry, which are used in bilateral hand activities. Asymmetry is a characteristic of movement patterns until almost 3 months of age. Symmetric patterns predominate between 3 and 10 months of age when bilateral reach, grasp and mouthing of the hands are developed primarily for normal children (Case-smith, J 2001, pp. 294-303). When the children can grip the big ball by both hand that is symmetrical pattern and when can open the cork of bottle by one hand and another hand grip the bottle that is asymmetrical pattern.

### **1.7.3. Carry**

Carry involves a smooth combination of body movements which stabilizing an object in the hand. Small ranges of movements are used and adjusted in accordance with the demand of tasks. Co-contraction in the more distal joints of the wrist and hand often is present (Case-smith, J 2001, pp. 301-303). More over time the children with CP cannot move joints due to spastic or fluctuating tone and limited joints range of motion.

### **1.7.4. Voluntary release**

Voluntary release, like grasp, depends on control of arm and finger movements. To place an object for release, the arm needs to move into position accurately and then stabilize as the fingers thumb extended (Case-smith, J 2001 pp. 294-303). In abnormal pattern the children cannot release voluntarily, just fall down the object from hand.

## **1.8. Cerebral palsy children and their hand skills pattern**

Hand skills problem are associated with the abnormal tone in upper and lower extremity. The children with CP have a problem in extremity like- upper or lower or both. Each type of child shows abnormal tone in their extremity. The muscles of the shoulder, upper body and arms must be strong to permit good hand function. When the muscles are weaken, the child finds it as hard to sustain an activity such as using a keyboard as he will be unable to maintain his hands in the correct position (Kimmerle, M et al. 2003). The children with CP face hand impairment including slowness,

weakness, uncoordinated movements, incomplete finger fractionation and spasticity (Eliasson, AC et al. 2006, p. 1227). For this reason they have problem in hand skills pattern.

The CP children face functional difficulties of the impaired side which influenced by abnormal patterns of muscle tone and movement, spasticity, decreased power, increased fatigue, reduced speed of movement and poor grasp, release and pinch functions (Dubois, L et al. 2003, p. 89).

## **1.9. Cerebral palsy and ADLs performance**

ADLs are defined as the things we normally do such as feeding ourselves, bathing, dressing, grooming, work, home making and leisure. While basic categories of ADLs have been suggested, the specifically constitutes a particular ADL in a particular environment for a particular person may vary. In Bangladeshi context the child are highly dependent to the mother. Mother helps their children to perform their daily activities like dressing, washing and prepared for schooling at the early age. Sometime mother provide continuous instruction for fine performance of their children. So the children are depending on their mothers. In Bangladesh the parents show a guiding instruction, interaction and responsibilities towards their children (Barn, R n.d., University of London). Researcher has described activities of daily living in three performance area like- Self care, Productivity and Leisure. The children will CP face problem in their daily living activities due to abnormal muscle tone and body coordination.

### **1.9.1. Self care**

Self care has been defined as the right and responsibility to take care of your physical, emotional and spiritual well-being. Self care tasks and instrumental activities of daily living (ADLs) encompass some of the most important task that children learn as they mature. Basic self care tasks including grooming, bathing, toileting, dressing, feeding, achieving functional mobility and communicating. Children learn this task in society appropriate ways (Case-smith, J 2001, p. 515).

The children can perform self drinking within one year of old and can perform self feeding after set up within 3 years of old (Mannheim, JK 2011). The children with CP suffer with delay developmental process. So, they face difficulty in performance. On



the other hand fine motor skills or hand skills components are related with self care task. Such as:

Feeding. (Example: Lateral pinch, for pick up the spoon ;)

Dressing. (Example: Symmetric/ Asymmetric hand using)

Grooming. (Example: Power grip, griping the handle of the brush/ comb)

### **1.9.2. Productivity**

Occupation serves as a means of organizing time, space and materials. Patterns, habits and roles evolve through the organization of occupation (Kimmerle, M et al. 2003). Such as: student (example: griping the pencil). The children are able to draw a line within 2-3 years of old and within 5 years of old able to draw stick figures (Mannheim, JK 2011). When the child faces developmental delay then could not perform age appropriate behavior and face difficulty in hand writing.

### **1.9.3. Leisure**

Leisure is an essential part of our lives. When we're involved in satisfying leisure activities, we can gain a sense of freedom, control, creativity and achievement. Leisure also gives us the chance to develop our skills, friendships, and self-confidence. It helps us enjoy new experiences, challenges and adventures, and to stay healthy (Austin Health Victoria 2011). Such as: Paying with ball/ marble/ coin. Normally children start play within 1 year. They responded with sound and showing different behaviors. Within the age of 2 years children learn to share toys and after one year more they learn to paddle tricycle (Case-smith, J 2001, pp. 528-530). In where the CP children could not perform those tasks due to abnormal posture, tone, involuntary movement and some time for cognitive delay.

## **1.10. Hand skills pattern and ADLs performance**

The children need normal hand skills pattern during performing any activity. When it's developing sequentially then the children can perform normal function. The child with CP present a impaired in hand functions and lead to functional limitations in activities of daily living (Eliassion, AC et al. 2006, p. 1227). During daily living activities performance like feeding, grooming and playing children need to pick up the spoon, griping the handle of the brush/ comb and griping the football. By the accumulation of those small tasks the child might be able to accomplish a full activity.

So when the children performing those tasks they need hand skills patterns, otherwise they can't perform the tasks.

### **1.11. Occupational therapy role to improve hand skill patterns**

An occupational therapist specializes in improving the development of the small muscles of the body, such as the hands, feet, face, fingers and toes. Therapists also teach daily living skills such as dressing and eating, as well as making sure children are properly positioned in wheelchairs. Occupational therapy interventions enhance children's functional performance by achieving the gross and fine motor skills. Occupational therapy intervention has been shown to have a positive effect on CP with fine motor difficulties (Case-smith, J 2001, p. 792). Hand skill patterns are small component of fine motor skills. Fun-filled games and activities help children develop gross motor skills, increase balance, enhance directionality, and stress left/right discrimination. Activities for preschoolers and early childhood are helpful for skills development (Cerebral palsy alliance 2009). Occupational therapy for CP can meet children's needs by working on fine motor skills so that kids can grasp and release toys and develop good handwriting skills. Occupational therapists also address hand-eye coordination to improve play skills, such as hitting a target, batting a ball, or copying from a blackboard. They also help children with severe developmental learning delays in some basic tasks, such as bathing, getting dressed, brushing their teeth, and feeding themselves (Cerebral Palsy Source 2005).

### **1.12. Indoor paediatric unit CRP**

The Centre for the Rehabilitation of the Paralyzed, commonly known as CRP, was founded in 1979 by a small group of Bangladeshis and a British physiotherapist, Valerie Taylor. Miss Taylor came to Bangladesh (then known as East Pakistan) in 1969 as a volunteer physiotherapist, and was appalled at the lack of facilities for the disabled. The hospital at CRP-Savar is the only hospital in Bangladesh that specializes in the treatment of spinal cord injuries. Beside this CRP have outdoor unit facilities for PWD like- paediatric unit, neuromusculoskeletal unit, stroke rehabilitation unit, sports injury unit and hand therapy unit etc. (Paediatric unit 2010, p.11).

In CRP there has 21 bedded indoor paediatric unit. The main aim of the paediatric unit is to run a two –week residential program designed to integrate children with

cerebral palsy into family and community life. To achieve this, children participate in physical and psychosocial therapy and carer/mothers are educated how to care for the child and taught about disability issues and rights. After admission the children are assessed in order to procedure an individual treatment plan. Every morning there is a hand therapy session and an individual session run with occupational therapists. The Occupational therapists work with the children for improving hand skill patterns by involving them in group therapy and individual hand therapy program. At the 1<sup>st</sup> day they assess the children hand function (reach, grasp, carry, release, manipulation and bilateral hand skills) by performing the activities. If the children couldn't perform any task then therapist provides support like minimum or maximum and keep document. After intervention, during evaluation period therapist re-assesses the children hand function performance for identifying the changes. If any change comes through the hand skill patterns then showing the differences in functional activities. Not only occupational therapists but also physiotherapist and speech and language therapist are worked in paediatric unit. At the last day of two weeks program therapists provide home plan to the caregiver or mother (Interview of Occupational therapist, In charge of Paediatric unit, CRP). Indoor paediatric unit data (from CRP annual report) are given to the Appendix-7.

### **1.13. Aim of the Study**

To explore the mothers' opinions and evaluations towards hand skills performance of their children with cerebral palsy after completing indoor program CRP, Savar.

### **1.14. Objectives**

The following objectives are to-

1. Explore understanding of mothers regarding occupational therapy interventions to their children with cerebral palsy.
2. Assess the understanding of mothers about changes of hand skills pattern of their children with cerebral palsy after occupational therapy intervention from CRP.
3. Explore the performance of children with cerebral palsy by hand skills pattern in relation with activities of daily living (ADLs) after completing two weeks indoor program.

### **2.1. Introduction**

The study aims at exploring the mother's opinions and evaluations towards hand skills performance of their children with CP after completing indoor program. Here the researcher finds out the mother understanding about Occupational therapy intervention after completing the indoor pediatric program. Not only these but also researcher explore the mothers understanding about hand skills pattern changes of their children with CP after occupational therapy intervention. Due to exploratory nature of the study, the qualitative methodology was selected for this study. Data was collected through face-to-face interview by using semi-structured questionnaire. Participants were selected through purposive comprehensive sampling.

### **2.2. Study design**

Qualitative method was chosen for the study. Its purpose is also to develop a concept according to mothers' view. In this study researcher has used qualitative content analysis. It is also called Ethnographic content analysis – a new form of QCA developed in 1996 by Altheide (cited in Priest, H n.d., pp. 36).

According to Hick's (2000, p.7)-

Qualitative research is exploratory in nature by which the researcher can gain insights into another person's view's opinion, feelings & beliefs within their own natural settings.

Researcher can regard content analysis in this study as a flexible method for analyzing text data (Cavanagh, cited in Shannon 2005, p. 2). Investigator determined the understanding of mothers' perception about occupational therapy intervention as well as improvement of involving ADLs basis on hand skills.

### **2.3. Study area**

The investigator has chosen the pediatric indoor unit of Centre for the rehabilitation of the Paralysed (CRP). Inpatient paediatric unit is a residential program that provides two weeks of intensive service for 21 children with their caregivers. They stay in mother and child care unit just for 14 days, then next group come for another 14 days.

In inpatient unit most of the children are cerebral palsy. In CRP the participants are available in indoor paediatric unit.

## **2.4. Participants**

### **2.4.1. Study population**

Mothers of children with cerebral palsy are population of the study those who come for treatment from indoor paediatric program.

### **2.4.2. Inclusion criteria for the participant**

- Those mothers of cerebral palsy children who have completed two weeks indoor paediatric program including occupational therapy sessions and maintained proper time schedule with the therapists.
- In this research the age range of cerebral palsy children is 4-10 years because the complex hand skills pattern could not develop before 4 years (Chu, 1997) and after 10 years participants are not available.
- Stephens & pratt (1989) mentioned that child needs to maintain proper body stability to perform hand activities. For this reason researcher has selected those mothers who are having children with proper rolling ability, head and neck control, eye hand coordination, can sit with minimum support almost needed to follow the instructions.

### **2.4.3. Participant selection procedure**

After taking permission from the paediatric unit researcher discussed with responsible occupational therapists of indoor paediatric unit about the research. Researcher also observed the children during assessment and intervention for selecting the participants. Researcher made a list of the children who were fulfill the inclusion criteria. Researcher contacted with every listed mother to become participant of the study.

Qualitative research tents to focus on the collecting of detail amount of data from relatively small sample of subjects by asking question or observing behavior (Hair, JF & Bush, P 2003, pp. 212-214). Participants were selected by purposive comprehensive sampling. When population under study is not available then purposive comprehensive sampling can be used. According to Fraenkel & Wallen (2000, p. 112)-

Purposive sampling is that a researcher do not simply study whoever is available, but use their judgment to select a sample that they belief based on prior information, will provide the data need.

In this type of sampling the sample is statistically representative. It is generally used in qualitative research; with small populations. According to Depoy & Gitlin (1998, p. 182-183) in naturalistic inquiry a small number of individual (4-10) will be necessary to include in the study. The small number of participant will provide a 'representative picture'. So, those mothers who fulfill the inclusion criteria, they are the sample of the study and 10 mothers had selected for participant of the study. Researcher also contacted with occupational therapists whose were responsible for those children and taking help to identify the current developmental status and head and neck control.

## **2.5. Field test**

Before starting the collection of data the researcher accomplished the field test with one participant. During the interview, researcher informed the participants about the aim and objectives of the study. This test had been performed to find out the difficulties that are existing in the questionnaires. By this test the researcher had re-modeled his questionnaires for those participants as they can understand the voice that the researcher wants to get from them.

## **2.6. Data collection**

Researcher conducted semi-structure face to face interview to collect information from the mothers about their children hand skills pattern. Through the face to face interview the researcher can develop rapport with the mothers which helping to observe and taking in-depth information. According to Bailey (1997, p-96)- 'Interview conducted face to face are more innovate allowing the interviewer to interact directly and develop rapport with the interviewee'.

### **2.6.1. Data collection procedure**

The researcher also used open-ended questionnaire with semi-structure interview to explore the mothers' evaluation of their children hand skill patterns. Open ended questions are most useful in dealing with complicated information when slight differences of opinions are important to know (Bailey 1997, p. 99). Researcher had asked the questions (Appendix- 5) at the beginning of the 14 days indoor program for

orienting the mothers about hand skills pattern. So these questions have asked within 1<sup>st</sup> and 2<sup>nd</sup> days. After 14 days occupational therapy program, researcher asked the questions (Appendix- 4) and again asked same questions (Appendix- 5) to the mothers. Appendix-4 is for find out the understanding about occupational therapy intervention and appendix-5 is for finding out the changes of their children hand skills pattern after OT intervention. Then researcher has self demonstrated the mothers about their children hand function that's why they could orient and understand the patterns of hand before treatment and at the final time of questioners they might feel any changes or not which affect in their understanding. Investigator also kept the observational note. The entire interview was conducted in Bengali whereas questions were prepared in Bangla. Through this face to face interview the interviewer has chance to read the nonverbal cues given the interviewee which may indicate confusion or lack of understanding. So that a question can be make understandable through change some words with constant the actual meaning (Bailey, 1997 p. 96). In some case, researcher explained the question into local language that was helpful to the participant.

### **2.6.2. Ethical Consideration**

The researcher took approval (Appendix-1) from supervisor and course coordinator, Department of Occupational therapy, BHPI an academic institute of Centre for the Rehabilitation of the Paralyzed (CRP) to do the study. Then permission was taken from the In-charge of paediatric unit (Appendix- 2) for data collection from the mothers. The investigator took consent from (Appendix- 3) to the participants who were interested to participate in the study and informed verbally about topic and purpose of study. The researcher ensures that the paediatric department will not hamper by this study. The participants did not deprive from any therapy session by this study. They have been treated as like other mothers in pediatric unit. The researcher has promised the participants that all information provided will be kept strictly confidentially and would not expose their identity. Researcher had ensured that never causing any harm or benefited to them but in future children with cerebral palsy may get benefited from the study.

### **2.6.3. Data collection tools**

- A tape recorder was used to record the interview of the participants. The use of recording method in interview requires great trust in the judgment. Information recording method of interview is the most appropriate (Polgar, S & Thomas, S 1991, pp. 121-124).
- Pen and paper was used to write down field notes or observation note from all participants.
- A semi-structured questionnaire was used to conduct interview (Semi-structure questions is attached in the Appendix-4 and Appendix-5).
- Consent form for the taking permission from the participants.
- Equipments (brush, comb, spoon, mirror, football etc.): which used for evaluating the performance.

### **2.6.4. Data analysis**

Researcher used Qualitative content analysis to analyze the data of mothers' perception about their children hand skills pattern. In this type of analysis, coding categories are derived from the text data (Shannon, SE 2005).

In the first step the researcher transcribed the entire interview in Bangla from MP3 recorder. He had almost kept his observation note from the field. After formulated the transcription it was given 6 individuals whose were competent in English to translate the data from Bangla to English. Researcher has completed three copy of data where one set is translated by own and another two copy data translating sets by the volunteers group. After that, the researcher verified those three data sets and also read it several times to recognize what the participants wanted to say in the interviews. In the same time the researcher listened the MP3 recorder to ensure the validity of data. The researcher organized the data according to each interview questions. Then each participant's answer was analyzed and find out some coding. The coding was different form each participant and then make some major categories and under those coding. Researcher had found some questions categories. In Appendix-1, question no. 1, 2 and 3 is detected the understanding of occupational therapy after receiving treatment. In Appendix-2, the question no. 2 indicate the reaching pattern, questions 3, 4, 7, 8 and 9 indicate the palmer grasp, question 5 and 6 indicate the pincher grasp, question 10 indicate carrying pattern, question 11 indicate bilateral symmetric hand using, question 12 indicate Translation (finger to palm) and question 13 indicate the



release pattern. After completing these question categories researcher found the answer categories at the beginning of the program and at the ending of the program. Some children of cerebral palsy are quadriplegia so the researcher had taking codes for major affected side or dominant hand. The categories are-

1. Orientation about occupational therapy before receiving treatment
2. Mothers understanding about occupational therapy after receiving treatment
3. Reaching pattern of CP children
4. Grasping pattern of CP children
5. Carrying pattern of CP children
6. Release pattern of CP children
7. Translation (finger to palm) of CP children
8. Bi-lateral symmetrical hand using of CP children
9. Overall change of hand skills pattern in relation with ADLs after completing the indoor pediatric program.

## **2.7. Rigor of the study**

During the interview session and analyzing the data researcher never tried to influence the process by her own value, perception and biases. The researcher accepted the answer of the questions whether they were of positive or negative impression. During asking questioners' researcher practiced all hand skills pattern to the children for finding out actual changes according to mothers. The transcripts were translated by another 6 peoples to avoid biasness and researcher checked it several the times with his own translation and recording to reduce any mistake and compared it with the Bangla transcript. Researcher tried to keep all the participants' related information and documents confidential. To reduce the sources of error and biasness of the study, this study was conducted in a systemic way by following the steps of research under supervision of an experienced supervisor.

In this research, result and discussion have been described in same chapter because this is common practice in reporting on qualitative studies (Stephenson & Wiles 2000, p.61). It indicates a summarizing statement of the most important findings and its meaning (Thomas, J & Nelson, JK 2001, p.364). So, all interviews and transcripts are studied several times to find out the codes and categories to discover the themes.

### 3.1. Themes of the study

**Theme-1:** All though the mother are not well oriented about occupational therapy but after receiving treatment they have good understanding, where in some case have incomplete idea.

**Theme-2:** Most of the mothers feel realistic changes in their children hand skills pattern however they are reported that the improvement of complex hand skills pattern are not possible within two weeks intervention program.

**Theme-3:** Most of the mothers thought that the hand skills pattern help the child to perform small task but after achieving complex hand skills pattern they could complete the whole functional task.

### 3.2. Result and Discussion

In the result section it has been possible to understand the mothers' opinion by content analysis, where some categories have been used. Under the different categories mothers' different opinion is different codes. Each table describes the interview findings. The tick was given only for those columns where the mothers spoke about those issues. Here 'P' was used for participant.

#### 3.2.1. Orientation about occupational therapy before receiving treatment

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Never heard about occupational therapy	√	√	√	√	√	√	√		√	
Heard about occupational therapy before come here								√		√

Table 1: Mother understanding before receiving occupational therapy from CRP.

Occupational therapy is a health care profession and the populations are not familiar with this therapy. Cerebral palsy children whose need treatment like physiotherapy, occupational therapy and speech and language therapy but their families are not aware about it. Most of the mothers said that never heard about occupational therapy. They said-

‘I have heard this name first time in my life after come here but the name is too difficult could not remember’.

In Occupational therapy annual report 2010, it has written that the occupational therapy course is only run by CRP and a limit number of students taking graduation from here. So, the profession is not familiar with the overall population in Bangladesh.

One mother said that-

‘During taking treatment from Shishu hospital, the doctor and physiotherapist have said about the occupational therapy in CRP ...’

From CRP-Bangladesh 2010, after completing the graduation from Bangladesh Health Professions Institute (BHPI), the occupational therapists are worked in different privet hospitals, disability related NGOs and special schools. Some occupational therapists and placement students are kept the professional flavor in different areas. So, the professional orientation is possible in some area as a result the mothers are familiar with it.

### **3.2.2. Mothers understanding about occupational therapy after receiving treatment**

<b>Code</b>	<b>P-1</b>	<b>P-2</b>	<b>P-3</b>	<b>P-4</b>	<b>P-5</b>	<b>P-6</b>	<b>P-7</b>	<b>P-8</b>	<b>P-9</b>	<b>P-10</b>
A hand therapy program	√	√	√	√	√			√	√	√
Education for eating, dressing and toileting					√		√	√		√
Treatment techniques/play with different toys	√		√	√		√	√		√	√
Preparation for schooling							√	√		

Daily living activities training	√	√		√		√				√
Writing practice					√					
Program for improve skills and attention		√			√	√				
Singing song and learn different techniques			√							

Table 2: Understanding of occupational therapy after receiving occupational therapy.

Mothers of CP children have received treatment from pediatric unit where they taken occupational therapy treatment. In different therapy sessions, they also observed the treatments and gain different experiences about occupational therapy. Most of the mother said that-

‘Occupational therapy is a hand therapy program where the children play with different toys which will enhance their hand performance’.

WFOT Council 2010 define as occupational therapy is a terms of participation, satisfaction derived from occupational participation and / or improvement in occupational performance. So, one major occupation of the children is playing and the therapist try to engage in those performances.

Mother said that-

‘I think that is a treatment technique which improves children skills and attention’.

Another mothers said that-

‘Occupational therapy is training and education for eating; dressing and toileting ... for improve daily living functioning’.

World Federation of occupational therapy 2010 said that Occupational therapy is a client-centered health profession concerned with promoting health and well being through occupation. The primary goal of occupational therapy is to enable people to participate successfully in the activities of everyday life. Two mothers said that-

‘I think that it the preparation for schooling’.

Occupational therapist can help the CP children with their handwriting or in developing learning strategies to help them remain focused in class and get their

homework done. So the mothers are achieved a good knowledge about OT after receiving treatment where in some case they have an incomplete idea (Debois, L et al. 2004).

### 3.2.3. Reaching pattern of cerebral palsy children

#### *Before treatment*

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/Independently				√			√		√	√
Need more time										
With abnormal pattern					√			√		
Need minimum support						√				
Need moderate support										
Need maximum support										
Need total support			√							
Cannot perform totally	√	√								

Table 3: Mothers opinion on reaching pattern about their CP children before treatment.

Reaching is an important pattern for perform daily activities. The children with CP have quiet difficulty in reaching pattern. Some mother said that-

‘The child just keep hand in fist position could not move from that position’.

Due to severe flexor tonicity in upper extremity the child could not engage hand in dynamic coordinated reaching (Zaal, FT & Botsma, RJ 2000, p. 871). The another mothers are said that-

‘My child can take hand near objects but extreme shacking movement with abnormal pattern’.

It is also being observed that the mothers said it with highly dissatisfaction. Jane Case-smith (2001 p. 294) said that reaching is a movement for achieving functional goal.

*After treatment*

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/Independently	√		√	√	√	√	√	√	√	√
Need more time										
With abnormal pattern		√								
Need minimum support										
Need moderate support										
Need maximum support										
Need total support										
Cannot perform totally										

Table 4: Mothers opinion on reaching pattern about their CP children after receiving treatment.

After taking treatment from pediatric unit most of the mothers have said that-

‘My child can take hand near to the object normally with following instruction’.

Observer understood from mothers’ opinion that the fist position and shacking movements are changed due to schedule treatments. According to Thiel EV (et al. 2000) have descried on their study coordinate reaching is a component of hand skills which enhance functional movements. Sugden & Uthley (1995) said that during controlling any objects, the movements of the hand and arm are linked.

### 3.2.4. Grasping pattern of cerebral palsy children

- *Palmar grasp before treatment:*

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/Independently										
Need more time										
With abnormal pattern							√			√
Need minimum support				√	√					
Need moderate support										
Need maximum support										
Need total support		√	√			√		√	√	

Cannot perform totally	√									
------------------------	---	--	--	--	--	--	--	--	--	--

Table 5: Mothers opinion on Palmar grasp about their CP children before treatment.

Grasp is a component of hand skill which is essential for performing any functions. There are two types of grasp. The palmar grasp is highly familiar with daily functioning. Most of the mothers said that-

‘Child cannot grasp any brush, marble, tennis ball and glass ...; he needs total support for performing this’.

These components are highly related with daily functioning including self-care and leisure for a child. Researcher observed that they try to perform but due to severe tone have no voluntary movement in fingers. So, in brushing and drinking water the child need total support for performance.

- **Palmar grasp after treatment:**

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/ Independently				√	√		√			√
Need more time										
With abnormal pattern										
Need minimum support			√			√		√	√	
Need moderate support	√	√								
Need maximum support										
Need total support										
Cannot perform totally										

Table 6: Mothers opinion on Palmer grasp about their CP children after treatment.

After the end of the program the mothers think that-

‘My child can grasp any brush, marble, tennis ball and glass with minimum support’.

So, mother feels some changes with their children performance. They thought that with minimum support they can perform those tasks. Almost those tasks are component of brushing and drinking. So these types griping influence their children daily activities.

Another mother said that-

‘My child can perform this task independently where the previous performance was abnormally ...’

Researcher has observed that the children gain some voluntary movements like fingers extension and opposition abnormally at the ending of the two weeks and they have started to do the little tasks from ADLs. So the mothers express some changes. Sugden & Uthley (1995) said that the palmar grips that immobilize an object and digital grips that facilitate for manipulation.

▪ ***Pincher grasp before treatment:***

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/ Independently										
Need more time										
With abnormal pattern							√			√
Need minimum support									√	
Need moderate support				√						
Need maximum support			√		√					
Need total support	√	√				√		√		
Cannot perform totally										

Table 7: Mothers opinion on Pincher grasp about their CP children before treatment.

Pincher grasp indicate the lateral pinch and tip pinch. During pick up any spoon or marble this type of grasp is important. Most of the mother said that-

‘My child cannot grasp it totally, need total support’.

Another mother said that-

‘The child can grasp it but cannot grasp with thumb support’.

The pincher grasps or finger tip forces may vary among the children due to objects weight and texture (Gordon, AM & Duff, SV 1999, p. 166). So, therapist practiced with components like pincher grip for achieving function which will facilitate daily activities.



- *Pincher grasp after treatment:*

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/ Independently				√			√		√	√
Need more time										
With abnormal pattern					√					
Need minimum support			√							
Need moderate support	√					√		√		
Need maximum support										
Need total support		√								
Cannot perform totally										

Table 8: Mothers opinion on Pincher grasp about their CP children after treatment.

After continuing intervention from hand therapy, the children performed with abnormal pattern, now can grasp independently. So mothers said that-

‘Yes, my can grasp spoon and marble correctly, now can give proper support with thumb...’

Another mothers said that-

No, my child could not perform normally; he needs moderate support to perform now where need maximum support previously ... Child tries to extend the hand and can sit independently.

Rainforth (2012) said that different motor skills helped to achieve functional outcome. So, after performing these patters the children ensure some tasks and facilitate to do the activities like eating and dressing. Researcher would not become agree with some mothers because in some children there are no changes in hand skills but the mothers say that the change is limited. It may be their satisfaction; as a result they express the changes.

### 3.2.5. Carrying pattern of cerebral palsy children

- *Before treatment*

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
------	-----	-----	-----	-----	-----	-----	-----	-----	-----	------



Need minimum support	√		√			√		√		
Need moderate support		√								
Need maximum support										
Need total support										
Cannot perform totally										

Table 10: Mothers opinion on carrying pattern of their cerebral palsy children after treatment.

After the ending of the program most of the mothers of cerebral palsy children said that-

‘My child can carry any ball/pen independently from one side to another side but sometime the hand shacks ... jerking movements’.

Researcher observed that after continuous treatment sessions mother feel changes in their children hand movement due to normalize the tone. French, R (1997– 2004) said in his article that keep body parts in good alignment as much as possible during any motion or movement which will give proximal stability and best performance.

### 3.2.6. Release pattern of cerebral palsy children

#### *Before treatment*

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/ Independently				√			√			√
Need more time										
With abnormal pattern									√	
Need minimum support					√					
Need moderate support										
Need maximum support			√							
Need total support		√				√				
Cannot perform totally	√							√		

Table 11: Mothers opinion on release pattern of their cerebral palsy children before treatment.

Release is one of the components of hand skills which are necessary at the ending of the task. After completing combing or brushing or drinking, we keep the comb or brush or glass in safety place. So, it is necessary in function. Two mothers said that-

‘My child cannot keep any object in appropriate place, he just keeps in fist position and closed fingers, so he cannot perform totally’.

Sugden and Uthley (1995) said that the synergies involve all the participating digits and thumb working together as convergent flexors/ extensors. French, R. (1997–2004) said that in his report hand grasp reflexes may make release difficulties or impossible.

Another three mothers said that-

‘Yes, my child can release any object independently with both hands ...’

***After treatment:***

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/ Independently				√			√		√	√
Need more time					√					
With abnormal pattern										
Need minimum support	√		√			√		√		
Need moderate support										
Need maximum support		√								
Need total support										
Cannot perform totally										

Table 12: Mothers opinion on release pattern of their cerebral palsy children after treatment.

After the ending of the program mother had evaluated their child release pattern and found some changes. Most of the mothers said that-

‘My child could open his hand and can extend fingers but have no enough strength to keep it appropriately ...; as a result I need a minimum support to perform it.’

Researcher observed that mothers said that due normalization of muscle tone and some voluntary extensor movement. One study said that the coordination of fingertip

forces during the replacement and release of an object the children with hemiplegic CP abruptly replaced the object but had a prolonged and uncoordinated release during performing any function (Eliasson, AC & Gordon, AM 2000).

### 3.2.7. Translation (finger to palm) of cerebral palsy children

#### *Before treatment*

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/ Independently										
Need more time					√					√
With abnormal pattern										
Need minimum support							√			
Need moderate support									√	
Need maximum support				√						
Need total support			√					√		
Cannot perform totally	√	√				√				

Table 13: Mothers opinion on finger to palmar translation before treatment.

Translation is very complex pattern among hand skills. It develops within 3-4 years for normal children. It is the kind of manipulation where the children need skilled fingers.

Most of the mother said that-

‘My child can not extend his hand, so how it is possible to pick up coin and take in palm ..., it is totally impossible for him’.

Two mothers said that-

‘My child can perform picking up coin from fingers to palm, but I have observed that the performance is not normal, he needs more time to grip and pick up’.

Tara Calder (2006) said that moving the items into the palm is easier than moving items out of the palm. Start with one item and increase in number as your child becomes more skilled which will ensure his independent functional performance like opening the bottle cork.



With abnormal pattern					√					
Need minimum support							√	√		
Need moderate support	√		√							
Need maximum support										
Need total support										
Cannot perform totally		√				√				

Table 15: Mothers opinion on bilateral symmetrical hand skill before treatment.

In case of bi-lateral hand skills, two mothers said that-

My child cannot move his hand and keep just in fist position, only one hand involve in activities, he never involve his affected hand. I feel that the hand is too tight in movement so he cannot perform totally this task.

Loretta, S et. al (2007) has described in her research that the motor impairment in children with hemiplegic CP leads to a priority of use of the unaffected hand. CP children coordinate their bimanual coordination by compensation with affected hand where non affected hand involved more (Hung, YC et al. 2004, p. 746).

▪ **After treatment:**

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
Normally/Appropriately/ Independently				√	√		√		√	√
Need more time										
With abnormal pattern										
Need minimum support	√		√					√		
Need moderate support						√				
Need maximum support		√								
Need total support										
Cannot perform totally										

Table 16: Mothers opinion on bilateral symmetrical hand skill after treatment.

After taking treatment, some mothers said that-

‘The child cannot hold any football by both hands, now try to engage the affected hand but could not; need a minimum support to perform this task’.

Another mothers said that-

‘After therapy my child can hold the football by both hands normally where previously needed moderate support’.

French, R (1997– 2004) said that using of larger balls that enable the fingers to be extended. In occupational therapy program the therapist practiced different hand activities including football throwing which may affects in child flexor tone in hand. By the improvement of this pattern children can ensure a degree of progress in his active performance. Researcher observed that some mothers express a lots of changes in symmetrical grasp actually it was not happen.

### 3.2.9. Overall change of hand skills pattern in relation with ADLs after completing the indoor pediatric program

Code	P-1	P-2	P-3	P-4	P-5	P-6	P-7	P-8	P-9	P-10
No shacking movement							√			
Can extend hand fingers	√		√		√	√		√		
Can move hand with abnormal pattern		√								
Grasp objects with abnormal pattern					√					
Just can reach the hand normally						√				√
Now can perform normally			√	√					√	√
Can raise both hands up to the head							√			
Now engage in ADLs								√	√	

Table 17: Mothers understanding of overall hand skills pattern.

Mothers of CP children have found some changes in their children hand skills after completing the program, where most of the mothers of spastic CP said that-

Now my child can extend the fingers during any grasping where he keeps the fingers in a fist position previously, now he try to perform activities where didn't want to move the hands previously.

According to Surden & Uthley (1995), during performing functional task the normal skill in children with CP involves reaching and grasping rather than manipulatory or complex pattern.



According to Molnar, GE (1991) therapies for neuromuscular disorders like CP in infants and young children incorporate handling, positioning, and play for postural and voluntary movements responses that are prerequisites for gross and fine motor milestones. So, after intervention can expect some improvements in fine motor skills.

Another mothers said that-

My child can perform the activities normally, like brushing, combing toilet sitting (for 5 minutes), cross sitting, weight bearing on both sides in sitting position and dressing with minimum support ... Now my child tries to eat dry food independently. I think that actually he has got a new motivation for live.

*My Child without Limits Advisory Committee (2007)* said that Occupational therapists focus on the development of fine motor skills and on optimizing upper body function and improving posture. Researchers have observed that the mothers are realized the changes of their children hand skills and they are being able to link with the daily living performance.

Mothers could understand that the basic hand skills pattern (reach, grasp, carry, release) are changed within two weeks program as a result they initially starting the functional task but those not fulfill the whole activity. The children need to perform the complex pattern which helps to accomplish the whole activities. At the beginning of the treatment they observed their children's performance like holding the ball, spoon, brush and marble etc. They are being able to understand that holding of different objects enhance their children functional performance like eating, dressing, toileting, combing, playing and writing. So, the children ensure independent performance when the mothers continue those treatment, therapy in home or and centre.

### **3.3. Limitation**

A limited study has been conducted on mothers' perception of CP children hand skills pattern on Bangladeshi perspective, so there is limited information from books, Google search, journal and annual reports. He had tried heart and soul to relate the information with the research study like hand skills pattern and functional performance.

At the beginning of the first research in life researcher felt some limitation due to enough recourses, journal access and internet accessibly. Researcher thinks that if he had more time with the literature and content analysis, the research would be more structured. Even the researcher tries best to find out literature considering with the undergraduate level.

### **4.1. Recommendation**

After completing the research the researcher found some recommendation for therapists and caregiver. Those recommendations are-

- Every occupational therapist should explain to the mother about occupational therapy very clearly and check with every mother that may help them to differentiate it from other health professions.
- Therapist should explain to the mothers about their children's possible outcome at the beginning of the program otherwise mothers expect a lot at the initial of treatment and become dissatisfied after treatment.
- In further research of the area, the researcher should maintain predetermined data collection schedule consider with another therapists schedule with mothers of cerebral palsy children.
- The therapist should explain the effects of playing with different toys and grasp, and also should explain and link these components with activities of daily performance.

This study has been conducted on mothers' perception about hand skills pattern. Further study can be done about the effectiveness of occupational therapy treatment in hand skills pattern of cerebral palsy children through experimental study; and the survey about mothers' perception of their children hand skills pattern with quantitative method can also be conducted. In next time this study can be done with large of sample including other outdoor caregivers of children with cerebral palsy.

### **4.2. Conclusion**

The study has been conducted to explore the mothers' perception about their children with CP hand skills pattern after completing indoor paediatric program CRP. From the result of the study it is found that the mothers have an effective or realistic understanding about occupational therapy intervention. It is also found that the mothers feel some changes in their children hand skills pattern like avoiding abnormal pattern, can extend the fingers with normal tone and voluntary movements. They have also understood the importance of hand skills pattern. After completing the indoor

program, mother can link the hand skills pattern and daily performance. They have felt that the children can perform self care and leisure by the improving skills of hand.

But in some case the manipulating works (like buttoning and opening cork) have no change in their performance after ending of the program. They thought that there have no changes in their children hand skills pattern just because of two weeks program. The children should continue therapy for a long period of time in order to get marked outcome.

On the other hand the two weeks intervention program is really effective according to mothers' perspective and they feel a realistic change on their children's functional performance. It is true that some mothers could not understand about occupational therapy. They come for taking treatment with over expectation and feel frustration after the ending of the program.

So, these finding will help the occupational therapists for building up new strategies which will benefit the mothers. Overall the program is really effective for the children with cerebral palsy.

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## Appendix- 1

### Permission Letter for conducting research

Date: 03.08.11

To

The Course Coordinator,

Department of Occupational Therapy

Bangladesh Health Professions Institute (BHPI)

CRP, Chapain, Savar, Dhaka-1343

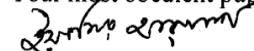
Subject: Prayer for seeking permission to conduct the research project.

Sir,

With due respect and humble submission beg most respectfully to state that I am a student of 4<sup>th</sup> year of B.Sc in occupational Therapy of Bangladesh Health Professions Institute, the academic institute of Centre for the Rehabilitation of the Paralyzed(CRP). I am sincerely seeking permission to conduct my research project as the partly fulfillment of the requirements of degree of B.Sc in Occupational Therapy. The title of my research is- "Mother's perception in improvement of hand skills pattern of their cerebral palsy children to perform ADL's: Mother and Child care unit CRP". The aim of the study is "To explore the mother's opinions and evaluations towards hand skills performance of their cerebral palsy children after completing indoor program CRP, Savar.

So, I therefore pray and hope that you would be kind enough to grant me the permission of conducting the research and will help me to complete a successful study as a part of my course.

Your most obedient pupil,



Md. Yeasir Arafat Alve

4<sup>th</sup> year, B.Sc in occupational Therapy,

Bangladesh Health Professions Institute (BHPI)

CRP-Chapain, Savar, Dhaka-1343

<i>Approved by</i>	<i>Signature</i>
<i>Course Coordinator</i> Md. Julker Nayan Lecturer & Course Coordinator Department of Occupational Therapy	<i>Approved and wish you good luck.</i> <i>M. Nayan</i> 06.08.11
<i>Research supervisor</i> Umme Aeymen Lecturer in Occupational Therapy Department of occupational therapy	<i>Recommend to conduct study following the Proposal.</i> <i>Umme Aeymen</i> 06.08.2011

*Umme Aeymen*  
Lecturer  
Dept. of Occupational Therapy  
BHPI, CRP, Savar, Dhaka-1343

## Appendix - 2

### Permission Lette

Date: 12.11.11.....

To

The In-Charge

Pediatric Unit

CRP, Savar, Dhaka

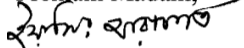
**Subject:** Prayer for seeking permission to collect data from pediatric unit, CRP.

Madam,

I beg most respectfully to state that, I am a student of 4<sup>th</sup> year occupational therapy department of Bangladesh Health Professions Institute. I am interested to conduct a qualitative study on pediatric unit. My research title is "*Mother's perception in improvement of hand skills pattern of their cerebral palsy children to perform ADLs: Mother and Child care unit CRP*" The aim of the study is 'To explore the mother's opinions and evaluations towards hand skills performance of their cerebral palsy children after completing indoor program CRP, Savar'. Mothers of children with cerebral palsy are the participants of my research project. Now I am looking for your kind approval to start my data collection and I would like to assure that anything of my research period will not harmful for the participants. Informed consent will fill up by the mother for their ethical consideration.

So, I therefore, pray and hope that you would be kind enough to grant me the permission of collecting the data and will help me to conduct a successful study as a part of my course.


I remain Madam,



Md. Yeasir Arafat Alve

4<sup>th</sup> year, B Sc in Occupational Therapy

BHPI, CRP-Chapain, Savar, Dhaka-1343.

He is permitted for  
data collection.  
Please help  
Thanking him  
  
12-11-11

## Appendix - 3 (A)

# Consent Form

The researcher, Md. Yeasir Arafat Alve is a 4<sup>th</sup> year B Sc in Occupational therapy student of Bangladesh Health Professions Institute (BHPI), the academic institute of Centre for the Rehabilitation of the Paralyzed (CRP). This study is a part of 4<sup>th</sup> year course curriculum. The title of the study is:

**“Mother’s perception in changes of hand skills pattern of their cerebral palsy children to perform ADLs: Mother and Child care unit CRP”**

In this study I am \_\_\_\_\_ a participant and clearly inform about the aim of the study. I will have the right to refuse in taking part any time at any stage of the study. For that reason I will not be bound to answer any body. This study will not have any impacts on me or my child’s at present and future.

I am informing that, the entire information collected from the interview that will use in the study will be safety enough and maintained confidentiality. Here only the researcher and supervisor eligible to access in the information. The researcher will be available to answer any study related question or inquiry to the participant.

I have been informed about the above all mentioned and agree to participate in the study willingly. I hereby give my consent.

Signature of the participant:	Date:
Signature of the researcher:	Date:
Signature of the witness:	Date:

Appendix - 3 (b)

## māšZcĪ

GB M̄tel Yv 4\_ēl AKzckbvj t\_ivcx wfv̄M̄i Aa"q̄bi GK̄U Ask wētkl |  
M̄tel K tgv̄t Bq̄wmi Av̄ivdvZ Avj fx evsj v̄`k tnj & c̄dkb̄n Bb̄w÷̄UJ̄t̄Ui  
wē.Gm̄.wm Bb AKzckbvj t\_ivcx wfv̄M̄i 4\_ēl P̄ Aa"q̄bi Z GK̄Rb w̄bq̄gZ  
Qv̄Ī | Zvi M̄tel Yvi wēl q̄ " % b̄w`b KvRKḡm̄āúv`tb t̄m̄w̄ēj̄ cvj w̄m ev" P̄v̄`i  
nv̄t̄Zi w̄bcȳZvi gj`vq̄tb Zv̄`i gv̄ t`i av̄i Yv t̄Kgb: AšZwēP̄M̄, gv̄ l w̄ki t̄m̄ev  
wēfv̄M̄, w̄m. Av̄i. w̄c, m̄v̄fvi" |

GB M̄tel Yvq Av̄w̄g ..... GK̄Rb  
AskM̄h̄YK̄vix Ges Av̄w̄g GB M̄tel Yvi D̄f̄Ī k" c̄w̄ī®vi f̄v̄t̄e R̄v̄b̄t̄Z t̄c̄t̄īw̄Q | Av̄w̄g  
th t̄K̄vb mḡq Ges M̄tel Yvi th t̄K̄vb ch̄q̄q Av̄gvi AskM̄h̄Y c̄Z̄`v̄nvi Kīt̄Z  
c̄w̄ī | G Rb" Av̄w̄g K̄v̄t̄iv K̄v̄t̄Q Revew̄ w̄n l ¶̄w̄Zc̄i-Y w̄`t̄Z eva" b̄B | GB  
M̄tel Yvq AskM̄h̄Y Kīt̄j Av̄gvi ev" P̄vi w̄P̄w̄K̄rm̄vi t̄K̄vb e"v̄N̄v̄Z NŪt̄e b̄v |  
m̄v̄¶̄v̄ZK̄v̄t̄i i m̄K̄j Z\_` th M̄t̄j v̄ M̄tel Yvi K̄v̄t̄R e"ēüZ n̄t̄e, t̄m̄, t̄j v̄ t̄M̄v̄c̄b̄x̄q̄Zvi  
m̄v̄t̄\_ w̄b̄ivc` `v̄t̄b̄ i v̄L̄v̄ n̄t̄e | ī aḡv̄Ī M̄tel K G Z\_` M̄t̄j vi c̄ēk̄w̄aK̄vi c̄v̄t̄e Ges  
K̄vi l b̄vg t̄K̄v̄\_vl b̄v Q̄w̄ic̄t̄q G Z\_` , t̄j v̄ M̄tel Yv c̄f̄Ī c̄K̄w̄m̄k̄Z n̄t̄e |  
Av̄w̄g D̄c̄t̄iv<sup>3</sup> m̄K̄j Z\_` , t̄j v̄ m̄āútk̄®R̄w̄b Ges Av̄w̄g GB M̄tel Yvq AskM̄h̄t̄b  
m̄āšZ Āv̄cb Kīw̄Q |

AskM̄h̄YK̄vixi w̄Ucm̄B A_ev̄ m̄v̄¶̄i:	Z̄w̄i L:
M̄tel t̄Ki m̄v̄¶̄i	Z̄w̄i L:
`v̄¶̄xi w̄Ucm̄B A_ev̄ `v̄¶̄i:	Z̄w̄i L:

## Appendix - 4 (A)

### Questioner- 1

1. Would you like to say ever you heard about Occupational therapy?
2. What do you mean by Occupational therapy?
3. Would you like to say that which types of treatment have you taken from Occupational therapy?
4. Are these types of treatment really effective for your children?  
If yes, how?
5. Can you feel any change in your children's ADLs performance after 14 days treatment program? If yes, what is it?

## Appendix - 4 (b)

### **ckēĪ- 1**

1. Avcūb AbMñ Kti ej teb th, GLvþb Avmvi cte©KLbl AKzckbvj  
t\_ivcx mꝑúþKᵒ'þþQb?
2. Avcūb AKzckbvj t\_ivcx ej þZ ũK ejþSb?
3. Avcūb ũK AbMñ Kti ej teb th, Avcūb GB RvqMv t\_þK ũK ũK aiþbi  
ũPũKrmv ũbþqþQb?
4. GB ũPũKrmv c×ũZ, þj v Avcbvi ev"Þvi Rb" mũZ" B ũK, ijZcYᵒ?
5. Avcūb ũK gþbKþib, GB 14 ũ`b ũPũKrmvq Avcbvi ev"Þvi `bũ`b  
KvRKþgᵒKvb cKvi cũi eZᵒ GþmþQ ũK?  
hũ` n'vunq, Zþe Zv ũK?



## Appendix - 5 (A)

### Questioner- 2

1. Would you like to explain about the condition of your child's hand skills pattern (Therapist explain it before asking question) at present?
2. Did your child can reach their hand near to the objects (Like pencil/toy/ball)?
  - ✓ Can reach the hand normally?
3. Did your child can hold/grasp any bag (hook grasp)?
  - ✓ Notice can perform with fingers flexion and adduction or not?
4. Did your child can place brush/comb obliquely in their hand (Power grasp)?
5. Did your child can pick up spoon by index and thumb (Lateral pinch)?
  - ✓ Can hold the spoon by thumb support?
6. Did your child can pick up marble from the ground by fingers tip (Tip pinch)?
7. Did your child can hold the tennis ball (Spherical grasp)?
8. Did your child can pick up the glass (Cylindrical grasp)?
9. Did your child can hold the small mirror (Disk grasp)?
  - ✓ Can hold the disk by fingers tip with abducted fingers?
10. Did your child can carry pen/ bag from one place to another?
11. Did your child can release any object voluntarily?
12. Did your child can pick up the coin from the ground? (Finger to palm translation)
13. Did your child can hold the big football by two hands? (Symmetrical bi-lateral hand skills)

\*\*\* *[Researcher will observe mothers' facial expression and gesture during questioning]*

## Appendix - 5 (b)

### ckēĪ- 2

1. Avcub AbMh Kti ej teb th, Avcbvi er"Prv uk nvZ w`tq me ukQzaiZ cvti?  
✓ tm uk `rfvmeKfvte aiZ cvti?
2. Avcbvi er"Prv uk tcbwjmj /tLj bv/ej Gi ubKU mWk c×wZtZ nvZ tcŠQvZ cvti?  
✓ nvZ uk `rfvmeKfvte j pe`Zž ubKU ubZ cvti?
3. Avcbvi er"Prv uk \_tj ev tKvb e`vM nvZtZ ubZ cvti?  
✓ Av½j, tj v fvR Kti e`vM Gi wdZv aiZ cvti?
4. Avcbvi er"Prv uk mWk c×wZtZ eim/wPifx AvovAvnofvte nvZtZ aiZ cvti?
5. Avcbvi er"Prv uk tKvb tQvU PvgR mWk c×wZtZ nvZtZ aiZ cvti?  
✓ exv Av½j w`tq Pvc w`tq aiZ cvti?
6. Avcbvi er"Prv uk gvteP tKvb cvĪ t\_#K mWk c×wZtZ ZžtZ cvti?
7. Avcbvi er"Prv uk mWk c×wZtZ tUubm ej aiZ cvti?
8. Avcbvi er"Prv uk mWk c×wZtZ Mwm aiZ cvti?
9. Avcbvi er"Prv uk tQvU Avqbn mWk c×wZtZ aiZ cvti?  
✓ cvB Av½j cħwvi Z Kti Av½j i gv\_v w`tq aiZ cvti?
10. Avcbvi er"Prv uk tKvb Kj g/ ej nvZ w`tq enb (`vbršZi) KiZ cvti?
11. Avcbvi er"Prv uk tKvb ukQynvZ t\_#K mWk c×wZtZ ivLZ/QvotZ cvti?
12. Avcbvi er"Prv uk tqtS t\_#K mWk c×wZtZ cqmv nvZi Zvj žZ ubZ cvti?
13. Avcbvi er"Prv uk `B nvZ w`tq tKvb eo dtej mwšZ ifc mWk c×wZtZ aiZ cvti?

\*\*\* (MteIK ckēĪivi mgq gv Gi gylw½ j pKi teb Ges cQvRtb A½fw½ e`envi  
Ki teb)

## Appendix - 6

### Participants at a glance

<b>Participant No</b>	<b>Sex</b>	<b>Age</b>	<b>Location of place</b>
01	Male	3 years 7 months	Joypurhat
02	Male	4 years	Comilla
03	Male	4 years 5 months	Potuakhali
04	Female	8 years	Nowga
05	Female	8 years	Dhaka
06	Male	4 years	Mymenshing
07	Male	5 years	Dhaka
08	Male	4 years	Mymenshing
09	Female	7 years	Mymenshing
10	Male	9 years	Gazipur

## Appendix - 7

### CRP Annual Report in Pediatric unit

(2005-06, 2006-07, 2007-08, 2008-09 and 2010-11)

Year	Gender	Indoor patient	Outdoor patient
2001-2002	Boy	122	
	Girl	55	
2002-2003	Boy	156	
	Girl	78	
2004-2005	Boy	277	
	Girl	186	
2005-06	Boy	334	1266
	Girl	227	938
2006-07	Boy	289	2207
	Girl	213	1554
2007-08	Boy	535	872
	Girl	181	553
2008-09	Boy	316	680
	Girl	209	850
2010-11		512	13,136

**Table:** Number of children with disabilities who received services at CRP pediatric unit.

## Appendix- 8

### Tables of Result and Discussion

<b>Table</b>	<b>Topic</b>
Table 1	Mothers understanding before receiving occupational therapy from CRP.
Table 2	Understanding of occupational therapy after receiving occupational therapy.
Table 3	Mothers opinion on reaching pattern about their CP children before treatment.
Table 4	Mothers opinion on reaching pattern about their CP children after receiving treatment.
Table 5	Mothers opinion on Palmar grasp about their CP children before treatment.
Table 6	Mothers opinion on Palmer grasp about their CP children after treatment.
Table 7	Mothers opinion on Pincher grasp about their CP children before treatment.
Table 8	Mothers opinion on Pincher grasp about their CP children after treatment.
Table 9	Mothers opinion on carrying pattern of their CP children before treatment.
Table 10	Mothers opinion on carrying pattern of their CP children after treatment.
Table 11	Mothers opinion on release pattern of their CP children before treatment
Table 12	Mothers opinion on release pattern of their CP children after treatment.
Table 13	Mothers opinion on finger to palmar translation before treatment.
Table 14	Mothers opinion on finger to palmar translation after treatment.
Table 15	Mothers opinion on bilateral symmetrical hand skill before treatment.
Table 16	Mothers opinion on bilateral symmetrical hand skill after treatment.
Table 17	Mothers understanding of overall hand skills pattern in relation with ADLs after completing the indoor pediatric program

## Appendix - 9

### Personal communication document with in charge of Occupational therapy pediatric unit, CRP, Savar, Dhaka

Occupational Therapy  
In charge of Pediatric Unit, CRP.

12<sup>th</sup> November, 2011

In CRP there have 21 bedded indoor paediatric unit. The main aim of the pediatric unit is to run a two-week residential program designed to integrate children with cerebral palsy into family and community life. After admission the children are assessed in order to procedure an individual treatment. Every morning there is a group therapy, a hand therapy session and an individual session run with Occupational therapists. Occupational therapists work on improving hand skills by involving in different group therapy and individual hand therapy program. They find out problem by assessment in their daily performance and set up goal to achieve the function. The functions are closely related with the hand skills component like reach, grasp, carry, release, inhand manipulation and bi-lateral hand skills which enhance the performance to become structured and goal directed.

Provide all information  
true and he is collect  
from me.

Sh. M. M. M.  
19.03.12