

## Cerebral Palsy - A Cross-Sectional Study Describing Problems, Needs and Resources with Special Emphasis on Locomotion

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### Abstract

**Objective:** The objective of this study was to find out problems and resources of individuals with cerebral palsy with special emphasis on locomotion.

**Methods:** Total number of 53 subjects were included in the study. 38 subjects were male and there were 15 female in the study. The questionnaire was explained to the guardians of all the subjects. Each and every component was explained clearly and locomotion was emphasized to find out their functional independence Level.

**Results:** There were different types cerebral palsy subjects included such as, Spastic tetraplegia, Spastic hemiplegia, spastic diplegia, dyskinesia and mixed Cerebral palsy. Spastic tetraplegia (13%) and mixed (13%) were most common form of cerebral palsy followed by spastic diplegia (11%) Dyskinesia (2%) and do not know (2%) were least common.

**Conclusion:** The present study concluded that spastic tetraplegia and mixed cerebral palsy have maximum disability followed by hemiplegia and diplegia.

**Keywords:** Cerebral palsy; Physical activity; Locomotion

### Introduction

Cerebral palsy is characterized by motor impairment and can present with global physical and mental dysfunction. In 2001, the United Cerebral Palsy Foundation estimated that 764,000 children and adults in the United States carried the diagnosis of cerebral palsy. In addition, an estimated 8,000 babies and infants, plus 1,200 to 1,500 preschool-age children are diagnosed with cerebral palsy every year in the United States [1]. Cerebral palsy is a static neurologic condition resulting from brain injury that occurs before cerebral development is complete. Because brain development continues during the first two years of life, cerebral palsy can result from brain injury occurring during the prenatal, perinatal, or postnatal periods [2]. Seventy to 80 percent of cerebral palsy cases are acquired prenatally and from largely unknown causes. Birth complications, including asphyxia, are recurrently estimated to account for about 6 percent of patients with congenital cerebral palsy. Three neonatal risk factors for cerebral palsy include birth after fewer than 32 weeks' gestation, birth weight of less than 5 lb, 8 oz (2,500 g), intrauterine growth retardation, intracranial hemorrhage, and trauma. In about 10 to 20 percent of patients, cerebral palsy is acquired postnatally, mainly because of brain damage from bacterial meningitis, viral encephalitis, hyperbilirubinemia, motor vehicle collisions, falls, or child abuse [3]. Cerebral palsy (CP) is a frequently occurring condition in childhood: in the Netherlands children with CP account for approximately 50% of pediatric rehabilitation patients [4]. CP is defined as "a group of permanent disorders of the development of movement and posture, causing activity limitation that is attributed to non-progressive disturbances that occurred in the developing fetal or infant brain. The motor disorders of cerebral palsy are often accompanied by disturbances of sensation, perception, cognition, communication, and behavior, by epilepsy and by secondary musculoskeletal problems" [5]. Prevalence ranges from 1.39 to 2.80 per 1000 live births in years (1977-1988) was 1.51 per 1000 inhabitants [6]. The CP prevalence rose significantly over time: from 0.77 per 1000 inhabitants in 1977-1979 to 2.44 per 1000 in 1986-1988 [7]. Over the past decades, life expectancy for well-functioning adults with CP has increased and is close to that of the unaffected population [8]. Despite the high survival rates for persons with CP, consequences of

CP in adulthood are often poorly understood [9]. As described by the definition of CP, problems can occur in several areas. Furthermore, with ageing, health issues such as increased risk for cardiovascular disease and age-related decline in function are increasingly important to consider. At the same time, as persons with CP enter adulthood, attendance to rehabilitation care seriously declines, despite all the physical, social and emotional changes that may occur during this transition into adulthood [10]. Several studies report decreased contact with the health care system following completion of formal education and care is often disrupted when disabled persons enter adulthood [11,12].

However, many persons with CP return to rehabilitation care at adult age for treatment of worsening health problems such as fatigue and also contractures and pain [13,14]. From studies in Norway in unilateral and bilateral adults with CP, we know that fatigue is a common problem in CP: 30% of them experienced substantial fatigue, and 17% reported chronic fatigue, mainly those with bilateral CP [15-17]. Adults with CP can also experience problems in other areas: their participation in daily life and their experienced health-related quality of life (HRQOL) is shown to be lower than in the general population. For adolescents and adults with CP, and particularly those with bilateral CP, restrictions in participation have been reported in several areas, such as outdoor mobility, recreation, self-care and employment [18-20]. HRQOL is also lower than in the general population, especially in the physical domain [21-23]. It could be hypothesized that low levels of

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everyday physical activity (PA) and low levels of physical fitness may contribute to the worsening of health problems when persons with CP grow into adulthood. In the general population, PA and physical fitness are considered of major benefit to a healthy lifestyle [24,25] and are related to amongst all cardiovascular disease and diabetes mellitus [26-28]. In persons with CP, PA and physical fitness may be even more important in order to offset the decline in function that might occur with aging and deterioration of CP-related impairments such as reduced range of motion and increased spasticity or pain. Despite the expectation that persons with disabilities are at a high risk for an inactive lifestyle, only limited objective information is available regarding level of everyday PA of adults with CP [29]. There is evidence that diplegic children and adolescents with certain forms of CP are less physically active than able-bodied age-mates [30]. Particularly children and adolescents with a lower level of gross motor functioning had lower levels of everyday PA.

## Materials and Methods

### Study design: Survey study

53 subjects with cerebral palsy included in this study. Data were collected from Disha spastic and Asha School in military hospital in Meerut city (Uttar Pradesh) and their subjective opinions about physical condition and training emphasis on locomotion. Spastic tetraplegia (13%) and mixed (13%) were most common form of cerebral palsy followed by spastic diplegia (11%) Dyskinesia (2%) and do not know (2%) were least common. 38 Subjects were males and 15 were females. Questionnaire was made for the purpose of this study. It consists of 33 questions It was divided into five parts, concerning about demographic facts, diagnosis, locomotion, musculoskeletal problems (contracture and pain) and present physical status. Subjects were above 10 years of age included. The research work has been approved by research committee of college of applied education and health sciences. A consent form has been filled by all the subjects guardians. The questionnaire was explained to the guardians of all the subjects. The language used to explain the questionnaire was native to all the participants. Each and every component was explained clearly and locomotion was emphasized to find out how functionally independence. Information gathered was recorded and further used for data analysis.

## Results

A total of 53 subjects of cerebral palsy were included in the study aged more than 10 years.

### Demographic facts

38 were male and 15 female subjects were included. Spastic diplegia and spastic hemiplegia were most common type of CP reported (25%) followed by spastic tetraplegia (23%) and dyskinesia (21%). Four percent of the participants unaware of their diagnosis. All individuals were living with their parents (Table 1).

### Walking ability

Forty –nine percent of total group reported that they could walk without walking aids both inside and outside; only 15% subjects could walk inside. 26% were always walked with walking aid both inside and outside. 26% had never been able to walk and 24% had stopped walking. 3% individuals had lost their ability to walk with or without walking aids. 45% individuals had improved their walking abilities 4% individuals walking abilities remain same. 11 individuals walking ability decreased (Tables 2a and 2b).

### Wheelchairs

Sixty – seven individuals did not use a wheelchair. 18% of individuals used manual wheelchair.

### Contractures

Sixteen- percent reported contracture in two or three different joints. Contractures in the knee and elbow were reported most frequent (13%). Followed by extremities (11%). Followed by other joints (9%).

### Pain in muscles and joints

7% participants reported pain in two or more parts of the body. 11% reported pain foot. 15% reported pain knee. Pain in the knee was most frequent.

### Physical training

7% of subjects did not take physiotherapy training at all while 15%

Diagnosis	No.	%
Spastic diplegia	13	25
Spastic hemiplegia	13	25
Spastic tetraplegia	12	23
Dyskinesia	11	21
Mixed	2	4
Do not know	2	4

Table 1: Types of CP.

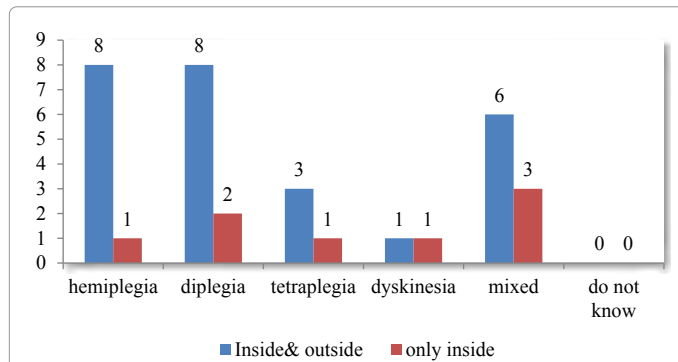
Walking Without Walking Aids	Hemiplegia No.	Diplegia No.	Tetraplegia No.	Dyskinesia No.	Mixed No.	Do Not Know No.	Total No.	Total %
Inside & outside	8	8	3	1	6	0	26	49
Only inside	1	2	1	1	3	0	8	15

Table 2a: Shows walking abilities of various CP with or without aids inside the home and outside the home.

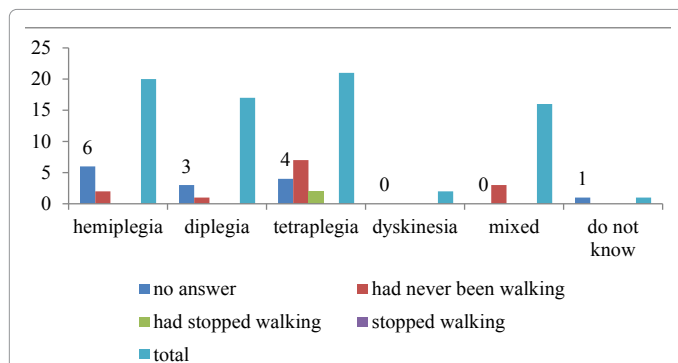
Not Walking	Hemiplegia	Diplegia	Tetraplegia	Dyskinesia	Mixed	Do Not Know	Total No.	Total %
Had never been walking	6	3	4	0	0	1	14	26
Had stopped walking	2	1	7	0	3	0	13	24
Stopped walking	0	0	2	0	0	0	2	3
No answer	0	0	0	0	0	0	0	0
Total	20	17	21	2	16	1	77	68

Table 2b: Depicts individuals who had stopped walking and who had never been walk).

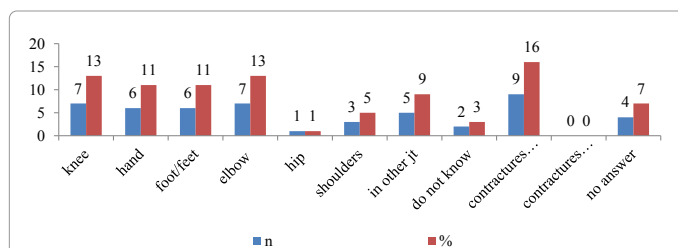
individuals had it occasional, 5% were once a week. Many participants also other had other form training. 16% of individuals had organized sports training, 16% had weight training and 9% of subjects have home training programme given by physiotherapist (Figures 1-4).



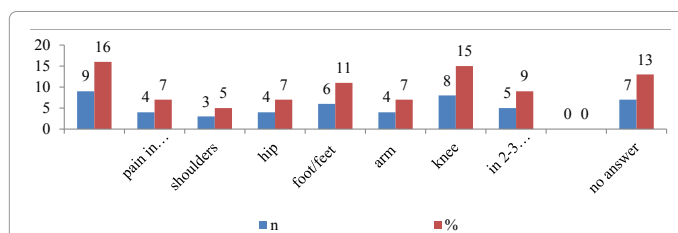
**Figure 1:** Blue column shows the participants who walk without walking aids inside and outside and the red column shows the participant who walk without walking aids only inside.



**Figure 2:** Blue column shows no answer, red column shows had never been walking, green column shows had stopped walking, purple column shows stopped walking, sky blue column.



**Figure 3:** Red column shows the percentage of individuals with CP who have contracture in various joints.



**Figure 4:** Red column shows maximum percentage of participant who have pain only in back, and blue column shows minimum percentage of participant who has pain in shoulder.

## Discussion

The study focused on demographic data of 53 individuals with cerebral palsy and their subjective opinion about their physical conditions and training with emphasizes on locomotion. All participants had been diagnosed at some point as having cerebral palsy and confirmed their diagnosis in the questionnaire. Spastic tetraplegia (20%) and mixed (20%) were most frequent reported type of cerebral palsy followed by spastic hemiplegia (23%). Spastic diplegia were 21% and dyskinesia and do not know varied to 4%. All the participants were living with their parents.

## Walking ability

49% of the total groups reported that they could walk without walking aids both inside and outside. And 15% participants could walk only inside. 26% always walked with walking aids both inside and outside. 24% had never been able to walk and 3% had stopped walking. 45% of these reported an improved walking ability and suggested that reason was regular physical training. 5% of the participants reported that walking ability had decreased. Problems that contributed to this decreased ability were knee problems, balance problems, lack of physical training.

## Wheelchair

- 67% of the respondents did not own a wheelchair.
- 18% use only manual wheelchair.
- 1% used electric wheelchair.
- 5% used manual and electric both type of wheelchairs.
- 3% of the [participants did not answered the question.

## Contractures

- Problems with contractures were reported by 80% of the participants.
- 16% had contractures in 2-3 different joints.
- Contractures in knee and elbow reported as most frequent (13%).
- In hand and foot (11%), in other joints (9%). In shoulder (5%).
- 7% participants did not replied.

## Pain

9% of all the participants felt pain in 2-3 different parts of the bod, most frequently reported was pain in back (16%), shoulder (5%), hip (7%). 11% of the participants never had pain in their muscle or joint while 20% had pain everyday, 32% vary occasionally, 15% about once a month, 13% once a week. 37% had other pain when standing still or when ill. In other 24% pain varied. 9% did not reply.

## Physical training

7% of the respondents did not receive any physiotherapy at all. 47% had everyday, 15% had occasionally, 1% had once a month, 18% had several times, 3% did not replied for this question.

## Transport

11% of the participants claim that they could transport themselves where they wanted or needed. 20% had difficulty in transporting themselves, 3% can transport themselves independently whenever they want or need. 7% did not give answer.

## Conclusion

The aim of the present study was to find out the problems and resources of individual with cerebral palsy with special emphasize on locomotion. With the help of this questionnaire we have identified the demographic facts, musculoskeletal problems and their present physical activity. The present study showed that tetraplegia and mixed cerebral palsy had maximum disability followed by hemiplegia. The findings also suggest that individual with cerebral palsy might benefit from physical training and thus able to stay ambulatory.

## Competing Interests

There is no financial support from any organization. There is no competing interest. Authors have no financial benefit from any resources. The material of the present study has not been published and submitted in any other journal.

## Conflicts of Interest

The material of the present study has not been published and submitted in any other journal. Research work is approved by the ethical committee of institute (College of Applied Education and Health sciences, Meerut).

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