



# “EFFICACY OF PHYSIOTHERAPY IN BEHAVIOURAL PROBLEMS OF PEDIATRIC NEUROLOGY PATIENTS AND CAREGIVERS.”

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## ABSTRACT

**Background and Purpose:** Neurological condition leads to mental, physical, psychological and cognitive disabilities or a combination of all. A person may be physically independent but many have various psychological problems. Psychological problems are common complications following cerebral palsy and have an impact on all aspects of recovery. To study the effect of physiotherapy treatment on the behavioural changes of pediatric patients and caregivers of patients with neurological condition.

**Subjects:** 30 subjects with pediatric patients of neurological condition. **Method:** A semi structured questionnaire including the Psychological General Well-being Index (PGWBI) and Gross motor function classification scale (GMFCS) will be used to collect information about Physiotherapy in behavioural problems of neurological condition of pediatric patients and their caregivers.

**Result:** The final sample was composed of 30 subjects, having mean age of 5.29 years old. ( $\pm 3.85$  SD) physiotherapy interventions were effective in reducing some of the behavioural disturbances ( $Z = -4.78$ ,  $p < 0.00001$ ) in patients as well as their caregivers.

**Conclusion:** Our result indicates physiotherapy treatment was effective in reducing the behavioural disorders and subjective burden among caregivers.

**KEY-WORDS:** Physiotherapy, Neurological patient, Behavioural problems.

## INTRODUCTION

Cerebral palsy is primarily a disorder of movement and posture. It is defined as an “umbrella term covering a group of non-progressive, but often changing, motor impairment syndromes secondary to lesions or anomalies of the brain arising in the early stages of its development”.

Motor sequelae in the cerebral palsy are commonly followed by disorders in the sensation, perception, cognition, communication, and behaviour by epilepsy and secondary muscle skeletal problems. Therefore, brain changes present in the person suffering from cerebral palsy are a biological limitation that may hinder the typical brain development, causing intellectual impairment or specific cognitive disorders.

It may be stated as a static encephalopathy in which, even though the primary lesion, anomaly or injury is static, the clinical pattern of presentation may change with time due to growth and developmental plasticity and maturation of the central nervous system.

**INCIDENCE:** The cause of CP to birth trauma and this view has persisted for several decades. Recent advances in neonatal management and obstetric care have not shown a decline in the incidence of CP. On the contrary, with a decline in infant mortality rate, there has actually been an increase in the incidence and severity of CP. The incidence in premature babies is much higher than in term babies. For the vast majority of term infants who develop CP, birth asphyxia or obstetric complications cannot be ascribed as the cause.

**Classification:** CP may be classified by the type of movement disorder, anatomical location of the child's impaired motor function, and scope of motor dysfunction. The type of movement Disorders can be described as spastic, hypotonic, dyskinetic, or ataxic.

**Spastic:** Spasticity occurs in approximately 75% of all children with CP. It is the most common neurologic abnormality seen in children with CP, including those with diplegia, hemiplegia, and quadriplegia. Spasticity is a complex motor abnormality, often difficult to describe, but a common definition is "hypertonia in which resistance to passive movement increases with increasing velocity of movement."

**Diplegia:** Diplegia is the most common form of spastic CP. A white matter infarct in the periventricular areas caused by hypoxia can lead to spastic diplegic CP. It primarily affects bilateral LEs, resulting in issues with gait, balance, and coordination. In standing, children with diplegia often present with an increased lumbar spine lordosis, anterior pelvic tilt, bilateral hip internal rotation, bilateral knee flexion, intoeing, and equinovalgus foot position.

**Hemiplegia:** Hemiplegia is a subtype of spastic CP in which the child's upper and lower extremity on the same side of the body are affected. Four main types of brain lesions result in hemiplegic CP. Periventricular white matter abnormalities have been reported as the most common diagnostic finding in children with hemiplegic CP. Cervical-subcortical lesions, brain malformations, and nonprogressive postnatal injuries have also been identified as the main causes of hemiplegia. The UE is typically more affected than the LE, and both tend to have more distal involvement than proximal involvement. Muscle spasticity on the affected side decreases muscle and bone growth, resulting in decreased range of motion (ROM). Therefore, children with hemiplegia often present with contractures and limb-length discrepancies on the involved side. The affected side of the child with hemiplegia often presents with shoulder protraction, elbow flexion, wrist flexion and ulnar deviation, pelvic retraction, hip internal rotation and flexion, knee flexion, and forefoot contact only due to plantar flexed foot. Children with hemiplegia tend to achieve all gross and fine motor milestones but not within the typical time frame.

**Quadriplegic:** Quadriplegia is a subtype of CP in which volitional muscle control of all four extremities is severely impaired. This subtype is also often accompanied by neck and trunk involvement. Like diplegic CP, periventricular white matter lesions are the most frequently observed neuroimaging finding in children with quadriplegic CP. Extensive lesions affecting the basal ganglia or occipital area often lead to visual impairments and seizures, both commonly seen in children with this subtype of CP. Cognition can vary from normal to severely impaired and is unique to each child with quadriplegia. It is important to note that children with quadriplegia who are unable to speak are often regarded as being cognitively impaired. However, once provided a means of effective communication, some are able to express their level of understanding and critical thinking.

**Dyskinetic:** Dyskinesia and movement disorders result in generally uncontrolled and involuntary movement that includes athetosis, rigidity, tremor, dystonia, ballismus, and Choreoathetosis. Common abnormalities found in imaging include deep gray matter lesions and, to a lesser extent, periventricular white matter lesions. Athetosis always has involuntary movements that are slow and writhing; abnormal in timing, direction, and spatial characteristics; and are usually large motions of the more proximal joints. Athetosis is rare as a primary movement disorder and is most often found in combination with chorea. Rigidity is much less common and is felt as resistance to both active and passive movement and is not velocity dependent. Tremor, a rhythmic movement of small magnitude, usually of the smaller joints, rarely occurs as an isolated disorder in CP but rather in combination with athetosis or ataxia. Dystonia is a slow motion with a torsional element that may involve one limb or the entire body and in which the pattern itself may change over time. Ballismus is the most rare movement disorder and involves random motion in large, fast patterns usually of a single limb. Choreoathetosis involves jerky movement, commonly of the digits and varying in the ROM.

**Ataxic:** Ataxic CP is primarily a disorder of balance and control in the timing of coordinated movements along with weakness, incoordination, a wide-based gait, and a noted tremor. This type of CP results from deficits in the cerebellum and often occurs in combination with spasticity and athetosis. The cerebellum is a major sensory processing center, and when impaired, ataxia will result.

**Hypotonic:** Hypotonia in a child with CP can be permanent but is more often transient in the evolution of athetosis or spasticity and might not represent a specific type of cp.

**AIM & OBJECTIVES****AIM**

To evaluate efficacy of physiotherapy in behavioural problems of pediatric neurology patients and caregivers.

**OBJECTIVES**

To know efficacy of physiotherapy in behavioural problems of pediatric neurology patients and caregivers.

To determine the efficacy of physiotherapy in behavioural problems of pediatric neurology patients and caregivers.

**MATERIAL USED:**

1. Informed consent form
2. Questionnaire/ Scales
3. Google forms
4. Mobile
5. Paper/ Pencil/pen

**METHODOLOGY:**

- **SOURCES OF DATA:**

Parul Sevashram Hospital

Kashiben Govardhandas Patel children's Hospital

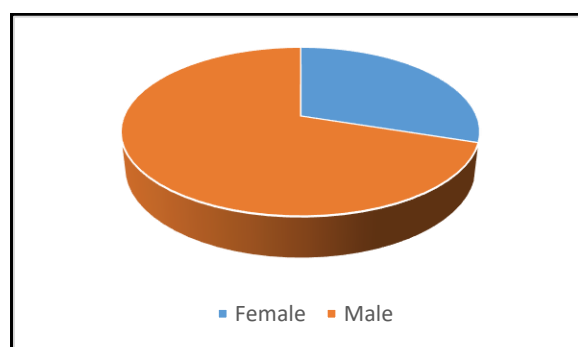
- **STUDY DESIGN:** This is a Convenience sampling.
- **STUDY TYPE:** This is a pre & post survey.
- **SAMPLE SIZE:** In this 30 (n=30) Pediatric patient with neurological condition & Caregivers of patients are taken.
- **STUDY POPULATION:** Pediatric patients (with neurological Condition) & Caregivers of patients.

**RESULT:**

**Table-1: Gender distribution of subjects:**

Gender	No. of Subjects	Percentage
Female	9	30%
Male	21	70%
Total	30	100%

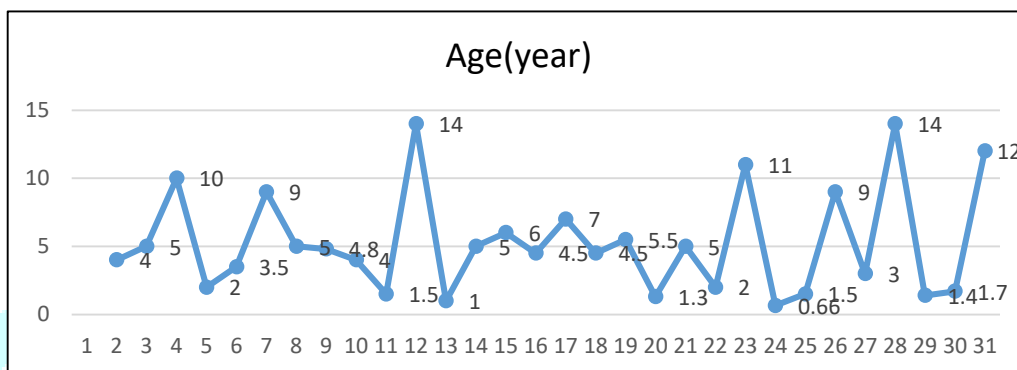
The above table shows that there is Gender distribution of subjects.



**Inference:** The above pie graph shows 70% of males and 30% of females are affected with neurological conditions.

**Table-2: Age distribution of subjects studied.**

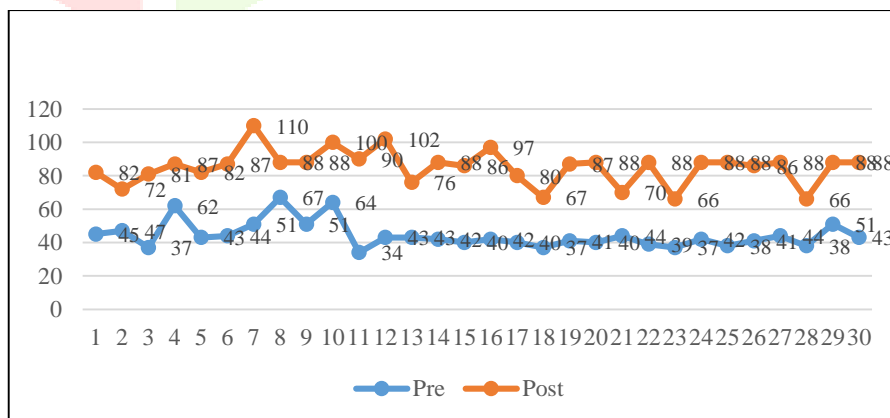
Age in years	No. of subjects
0-2	9
2-4	4
4-6	9
6-8	1
8-10	3
10-12	2
12-14	2
14-16	0



**Inference:** The age group of 0-2, 2-4, 4-6 years are commonly affected.

**Table-3: Analysis of Psychological General Well-being Index (PGWBI)**

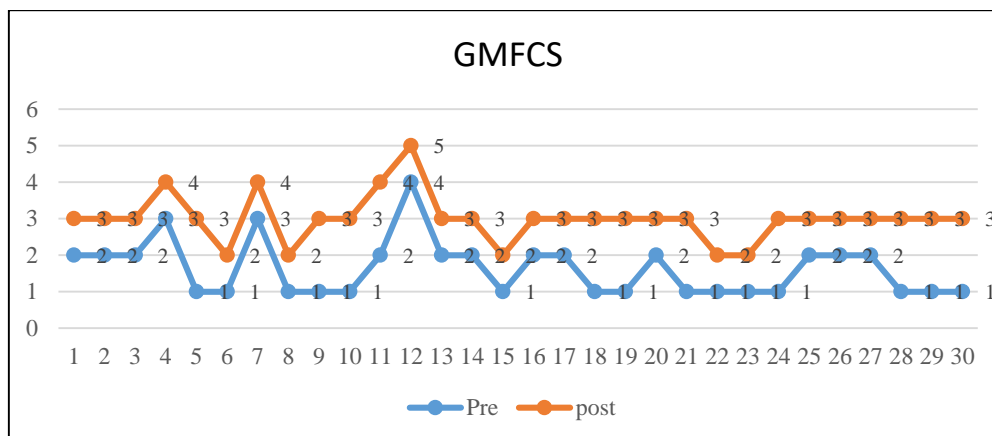
Parameters	Pre	Post
Mean	44.3333	85.1333
SD	7.94955	10.1565
Z value	-4.7821	
p value	<.00001	



**Inference:** The above line graph shows the difference in the mean score and individual score of the applied scale.

**Table-4: Analysis of Gross motor function classification scale (GMFCS).**

Parameters	Pre	Post
Mean	2.03333	3.1
SD	0.76489	0.643268
Z value	-4.7821	
p value	<.00001	



**Inference:** The graph indicates difference in the change of motor function improvement after physiotherapy treatment.

#### Interpretation of scales:

**Psychological General Well-being Scale:** The instrument has qualities that make it suitable also for monitoring well-being during interventions for stress-related exhaustion/clinical burnout.

**Gross motor Functional Classification of Scale:** The Gross Motor Function Classification System (GMFCS) for cerebral palsy is based on self-initiated movement, with emphasis on sitting, transfers, and mobility.

#### DISCUSSION

Cerebral palsy leads to mental, physical, psychological and cognitive disabilities or a combination of all. A person may be physically independent but many have various psychological problems.

Psychological problems are common complications following cerebral palsy and have an impact on all aspects of recovery. Children with CP are at increased risk of behavioural and emotional problems, with 1 in 4 developing a behavioural disorder.

Studies investigating behaviour in children with cerebral palsy have found that these children are more likely than their non-disabled peers to struggle with behavioural disorders. The rate of diagnosed disorders in the cerebral palsy population is higher than in the general population of children. As much as 25 to 30 percent of children with cerebral palsy also struggle with a behaviour disorder. It is harder to pinpoint exactly why children with cerebral palsy are more likely to have behavioural challenges. Some risk factors seem to be having learning disabilities, having a seizure disorder, being male, having multiple disabilities, and having communication difficulties. Outside factors may also contribute, including lack of proper care or stress and an inability to cope in the parents. Difficulty with communication seems to be a major factor in challenging behaviours. If a child with cerebral palsy is unable to communicate effectively, he or she may act out to get her needs met. The psychological symptoms were slightly less intense and less frequent in the follow up after a period of six weeks of physiotherapy treatment. Parents and other caregivers of children with cerebral palsy must be aware of the signs of a behavioural disorder so that the child can be evaluated and treated by experts. Living with behavioural challenges is difficult for everyone, for parents and caregivers, for the child with cerebral palsy, and for family members. Recognizing and addressing the problem behaviours early is crucial for helping a child cope and learn new and more appropriate behaviours.

There are several behavioural disorders that have been named and can be diagnosed, including attention deficit hyperactivity disorder, autism, and oppositional defiant disorder, but what is more important for parents and caregivers is to be able to recognize specific behaviours that are frequent, persistent, and problematic. The behavioural problems include Self-injury, Harming other people, Threatening others, Destroying property, Lying, Stealing, Disobedience, Hyperactivity, Impulsivity, These are just some of the potentially problematic behaviours that could indicate a behavioural disorder in a child with cerebral palsy. The general rule is that any behaviour that is inappropriate for a child's developmental age, such as tantrums in a ten year old, is problematic. Problematic behaviours that persist for six months or more may indicate a behavioural disorder.

### The analysis of the data collected showed:

The average score for sample subjects post PT treatment had increased which determined the improvement in the personal wellbeing of the patients as compared to pre PT treatment. (Refer graph 3) During the study it was found that more of males were affected than females. (Refer graph 1). Most of the patients affected by CP were in the age group of 0-2 years, 2-4 years and 4-6years. (Refer graph 2). The difference in the individual scores shows an improvement in the post PT treated patients than the pre PT treated. (Refer graph 4). The rate of improvement in the satisfaction of life as a whole is more in the CP patients post the PT treatment than the pre PT treatment. (Refer graph 4, 5 ). There is an increase in the standard of living post the PT treatment than the pre PT treatment. (Refer graph 4). Post PT treatment shows increase in the health improvement in CP patients than in the patients before the PT treatment. (Refer graph 4,5) The graph shows an increase improvement in the personal relationships post the PT treatment than in the patient's pre PT treatment. (Refer graph 4,5 ). The feeling of one's safety in CP in more post the PT treatment than in pre PT treated patients. (Refer graph 5). The satisfaction of feeling a part of the community is slightly more in the post PT treated patients than pretreated. (Refer graph 4,5) The study shows that patients post PT treated are more satisfied with their future security than they were pre PT treatment. (Refer graph 4,5)

Parents and other caregivers that believe a child with cerebral palsy is struggling with problem behaviours should consult with professionals who can evaluate the child, make a diagnosis, and help develop a treatment plan. As a parent, you may want to start with your child's school. A school psychologist or social worker may be able to do an evaluation or direct you to an appropriate professional. For a younger child, a pediatrician is a good place to start. A Pediatric Physiotherapist & behavioural health expert can evaluate your child through a series of observations and tests. Even if your child doesn't meet the criteria for a diagnosis, an expert can still guide you to the appropriate resources or professionals that can help. Any challenging behaviours, even those not labeled as a disorder, are disruptive and should be evaluated and addressed, both for the child and the child's family.

Positive parent-child relationship, encouraging desirable behaviour, teaching new skills and behaviours, managing misbehaviour, and managing high-risk situations. Parents made specific goals for change and were supported in enacting plans for managing challenging parenting situations. This illustrates the urgent need for clinical services to address behavioural and emotional problems in children with CP, as well as the good fit between this clinical need and the efficacy of parenting intervention. Parenting interventions, are ideally translatable. Pediatric Physiotherapy is designed for population-level dissemination, easily implemented within health or educational services, deliverable in high- and low-resource areas, and available in 25 countries.

Anyone may struggle with behavioural conditions or disorders, with challenging behaviours like aggression, impulsiveness, self-harm, and others. Children with cerebral palsy may be more vulnerable to these struggles because of the challenges that the physical disability presents or even because of the underlying brain damage that led to cerebral palsy.

Exactly what causes behaviour disorders is not fully understood, but it is important for parents and other adults to look out for signs of problematic behaviours in children living with cerebral palsy. Experts in behaviour and mental health can help parents and their children cope with and learn to change problem behaviours so that a child living with cerebral palsy can also learn to live with the best quality of life possible.

### Behaviour and Cerebral Palsy:

Studies investigating behaviour in children with cerebral palsy have found that these children are more likely than their non-disabled peers to struggle with behavioural disorders. The rate of diagnosed disorders in the cerebral palsy population is higher than in the general population of children. As much as 25 to 30 percent of children with cerebral palsy also struggle with a behaviour disorder.

It is harder to pinpoint exactly why children with cerebral palsy are more likely to have behavioural challenges. Some risk factors seem to be having learning disabilities, having a seizure disorder, being male, having multiple disabilities, and having communication difficulties. Outside factors may also contribute, including lack of proper care or stress and an inability to cope in the parents. Difficulty with communication seems to be a major factor in challenging behaviours. If a child with cerebral palsy is unable to communicate effectively, he or she may act out to get her needs met.

Parents and other caregivers of children with cerebral palsy must be aware of the signs of a behavioural disorder so that the child can be evaluated and treated by experts. Living with behavioural challenges is difficult for everyone, for parents and caregivers, for the child with cerebral palsy, and for family members. Recognizing and addressing the problem behaviours early is crucial for helping a child cope and learn new and more appropriate behaviours.

There are several behavioural disorders that have been named and can be diagnosed, including attention deficit hyperactivity disorder, autism, and oppositional defiant disorder, but what is more important for parents and caregivers is to be able to recognize specific behaviours that are frequent, persistent, and problematic. These may include:



These are just some of the potentially problematic behaviours that could indicate a behavioural disorder in a child with cerebral palsy. The general rule is that any behaviour that is inappropriate for a child's developmental age, such as tantrums in a ten year old, is problematic. Problematic behaviours that persist for six months or more may indicate a behavioural disorder.

#### Diagnosis and Treatment :

Parents and other caregivers that believe a child with cerebral palsy is struggling with problem behaviours should consult with professionals who can evaluate the child, make a diagnosis, and help develop a treatment plan. As a parent, you may want to start with your child's school. A school psychologist or social worker may be able to do an evaluation or direct you to an appropriate professional. For a younger child, a pediatrician is a good place to start.

A behavioural health expert can evaluate your child through a series of observations and tests. Even if your child doesn't meet the criteria for a diagnosis, an expert can still guide you to the appropriate resources or professionals that can help. Any challenging behaviours, even those not labeled as a disorder, are disruptive and should be evaluated and addressed, both for the child and the child's family.

Pediatric Physiotherapy & Cognitive behavioural therapy is a typical type of treatment or intervention for behavioural disorders. It is a type of therapy that helps patients become more aware of their behaviours, realize that they are problematic, and learn to change those behaviours by targeting troubling thoughts and emotions. It is an effective type of treatment that helps many people, adults and children, learn to change negative behaviours and replace them with those that are positive and productive.

Recognizing and getting treatment for a child struggling with cerebral palsy-associated behavioural disorders is crucial. These are the first steps toward helping a child learn to cope with negative emotions and other challenges that have led to problematic behaviours. Parents, family, friends, and caregivers of the child must also participate in supporting the treatment and encourage positive changes

Factors that support a child learning to change behaviours include providing all adequate care for cerebral palsy. A child that is not receiving the care he needs will continue to struggle with problematic behaviours. A stress-free home environment is also important. Some studies have shown that a parent's stress level can impact a child's behaviour in a negative way. A calm and caring environment can help support a child as he learns to make positive changes.

#### CONCLUSION:

Our result indicates physiotherapy treatment was effective in reducing the behavioural disorders and subjective burden among caregivers.

#### BIBLIOGRAPHY:

1. BD Chaurasia's Human Anatomy Regional and Applied Dissection and Clinical: Vol.3: Head- Neck Brain Paperback-Illustrated, 1 Jan 2013.
2. Rosenbaum P, Nigel P, Goldstein M. A report : the definition and classification of cerebral palsy. *Developmental Medicine & Child Neurology*. 2007;49(6):480.
3. MacLennan A. A template for defining a causal relation between acute intrapartum events and cerebral palsy: international consensus statement. *BMJ* 1999; 319: 1054-1059
4. Katz RT. Life expectancy for children with cerebral palsy and mental retardation: implications for life care planning. *NeuroRehabilitation*. 2003;18:261-270.
5. van Haastert LC, de Vries LS, Eijssermans MJC, et al. Gross motor functional abilities in preterm-born children with cerebral palsy due to periventricular leukomalacia. *Dev Med Child Neurol*. 2008;50:684-689.
6. Ramita S, Yadav SL, Singh U, Sumalatha KB. Physical mental health among caregivers of children with cerebral palsy. *Astrocyte* 2016;2:167-71.
7. Svedberg LE, Englund E, Malter H, Stener-Victorin E. Comparison of impact on mood, health, and daily living experiences of primary caregivers of walking and non-walking children with cerebral palsy and provided community services support. *Eur J Paediatr Neuroleuropeanjournalofpaediatricneurology*. 2010;14:239-46.