



بِسْمِ اللّٰهِ الرَّحْمٰنِ الرَّحِیْمِ



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Program of Medicine

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**The effect of physical therapy on children
with cerebral palsy in Yumna Care Center
and Al-tahadi Center 2022**

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2022

Preface

قال تعالى :

{وَتِلْكَ الْأَمْثَالُ نَضْرِبُهَا لِلنَّاسِ وَمَا يَعْقِلُهَا إِلَّا الْعَالِمُونَ}

صدق الله العظيم

سورة العنكبوت الآية (43)

Dedication

**Dedicated to Karim Salah, the point of light that
inspired us all.**

then, we extend our gratitude and gratitude

**To our families because their faith in us and their
sacrifices for us were among our strongest motives**

To complete this work.

Acknowledgement

We would like to express our deepest gratitude to

Dr. Hadeel Ahmed

Our supervisor, who generously provided knowledge and experience and for her patience and invaluable comments.

We would also like to extend our sincere thanks

To the families, physiotherapy departments, and all departments and families of the Yemeni Care Center and the Challenge Center for helping us fulfill

Our mission.

Abstract:

Background: cerebral palsy is A group of permanent disorders of movement and posture causing activity limitation, resulting from non-progressive lesions to the developing fetal or infant brain, affecting mainly the motor centers; cerebral cortex, cerebellum, and basal ganglia with frequent neurologic associations including: Mental retardation, Epilepsy, Impaired hearing; deafness, Impaired vision, Emotional disturbances, Behavioral disturbances.

Objectives: To evaluate of the effectiveness of physiotherapy intervention on children with cerebral palsy and identification of available treatment options including physiotherapy techniques and equipment that may assist in the daily functioning of children with cerebral palsy at Yumna Care Center and Al-tahadi Center 2022.

Method: The study was conducted at the Yumna Center for Physiotherapy and Rehabilitation of Children with Special Needs and Al-tahadi Center in Bahri Sudan, during the period from November to December 2022. Cross-sectional study done of Samples (103) parents, (2) centers and (30) physiotharapiest.

A well-designed questionnaire was distributed to parents, physiotherapists and center management participants, and returned the questionnaires after filling them in with all the required information.

The data were analyzed using the statistical package for social sciences (SPSS).

The result: The study found that multiple treatment options for parents help improve children's daily performance and have a weak inverse relationship with the speed of physiotherapy results, and that parents' commitment to physiotherapy at home may quickly affect the results of physiotherapy.

(90%) is agree with a clear imperative effect of physiotherapy on the children, and

(98%) of parents agree with the obvious inevitable effect of physiotherapy, (45.63%) of parents have the ability to apply physiotherapy at home.

(58.25%) is the effect of the psychological state of the child during the Physiotherapy session on the parents, and there are (50%) who agree that other medication help in the effectiveness of physiotherapy.

(47%) is the percentage effect of prenatal cerebral palsy and postnatal cerebral palsy in response to physical therapy.

The rate of pain in children with cerebral palsy before physical therapy and follow-up was (36.89%), and after follow-up and physical therapy, the pain decreased by (100%).

The study also found that, according to opinions, several factors contributed to the success of physiotherapy, such as the duration of physiotherapy planned by the therapist, programs associated with treatment, and others.

Conclusion: Cerebral palsy is the leading cause of physical disability in children. Physiotherapy increases independence and reduces the chances of bone deformation.

According to the results of this study, it is suggested that physiotherapists develop effective educational techniques in order to involve parents more in the home exercise program.

الملخص :

الخلفية : الشلل الدماغي عبارة عن مجموعة من اضطرابات الحركة والوضعية الدائمة التي تسبب تقييداً للنشاط ، ناجماً عن تلف غير متطور لدماغ الجنين أو الرضيع النامي ، ويؤثر بشكل أساسي على المراكز الحركية ؛ القشرة الدماغية والمخيخ والعقد القاعدية مع ارتباطات عصبية متكررة تشمل: التخلف العقلي والصرع وضعف السمع والصمم وضعف البصر والاضطرابات العاطفية والاضطرابات السلوكية .

الأهداف: تقييم فعالية تدخلات العلاج الطبيعي للأطفال المصابين بالشلل الدماغي وتحديد خيارات العلاج المتاحة بما في ذلك تقنيات ومعدات العلاج الطبيعي التي قد تساعد في الأداء اليومي للأطفال المصابين بالشلل الدماغي في مركز يمنا للرعاية ومركز التحدي.

الطريقة: أجريت الدراسة في مركز يمنى للعلاج الطبيعي وإعادة تأهيل الأطفال ذوي الاحتياجات الخاصة ومركز التحدي في بحري السودان ، خلال الفترة من نوفمبر إلى ديسمبر 2022 وتم دراسة قطاع عرضي لعدد (103) للآباء و(2) للمركز و(30) لأخصائيي العلاج الطبيعي.

تم توزيع استبيان جيد التصميم على الآباء وأخصائيي العلاج الطبيعي والمشاركين في إدارة المركز ،

(SPSS) . تم تحليل البيانات باستخدام برنامج الحزمة الإحصائية للعلوم الاجتماعية

النتيجة: ووجدت الدراسة أن خيارات العلاج المتعددة للآباء والأمهات تساعد على تحسين الأداء اليومي للأطفال ولها علاقة عكسية ضعيفة مع سرعة نتائج العلاج الطبيعي ، وأن التزام الوالدين بالعلاج الطبيعي في المنزل قد يؤثر بسرعة على نتائج العلاج الطبيعي.

يوافق (98%) من الآباء على التأثير الحتمي الواضح للعلاج الطبيعي، (45.63%) من الآباء لديهم القدرة على تطبيق العلاج الطبيعي في المنزل و (58.25%) هينسبة تأثير الحالة النفسية للطفل أثناء جلسة العلاج الطبيعي على الوالدين.

هناك (50%) يوافقون على أن الأدوية الأخرى تساعد في فعالية العلاج الطبيعي.

(47%) هي النسبة المئوية لتأثير الشلل الدماغي قبل الولادة والشلل الدماغي التالي للولادة استجابة للعلاج الطبيعي.

كانت نسبة الألم عند الأطفال المصابين بالشلل الدماغي قبل العلاج الطبيعي والمتابعة (36.89%) ، وبعد المتابعة والعلاج الطبيعي انخفض الألم بنسبة (100%).

ووجدت الدراسة أيضًا أنه وفقًا للآراء ، فإن عدة عوامل ساهمت في نجاح العلاج الطبيعي ، مثل مدة العلاج الطبيعي المخطط لها من قبل المعالج ، والبرامج المرتبطة بالعلاج ، وغيره.

استنتاج:الشلل الدماغي هو السبب الرئيسي للإعاقة الجسدية لدى الأطفال. يزيد العلاج الطبيعي من الاستقلالية ويقلل من فرص تشوه العظام.

وفقًا لنتائج هذه الدراسة ، يُقترح أن يقوم أخصائيو العلاج الطبيعي بتطوير تقنيات تعليمية فعالة من أجل إشراك الآباء بشكل أكبر في برنامج التمارين المنزلية.

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List of Abbreviations

Abbreviations	Meaning
CP	Cerebral Palsy
MRI	Magnetic Resonance Imaging
Oro-motor	Controlling Their Mouth, Lips, Tongue And Closing Their Mouth
NDT	Neurodevelopmental Therapy
SD	Standard Deviation
GMF	Gross Motor Function
PEDro scale	Outcomes Are Measured At Several Points In Time
IIB	Usefulness/Efficacy Is Less Well Established By. Evidence/Opinion
GMFCS	Gross Motor Function Classification System
MACS	Manual Ability Classification System
GAS	Goal Achievement Scale
QOL	Quality Of Life

Chapter (1)
Introduction

Introduction

1.1. Background:

cerebral palsy is A group of permanent disorders of movement and posture causing activity limitation, resulting from non-progressive lesions to then developing fetal or infant brain, affecting mainly the motor centers; cerebral cortex, cerebellum, and basal ganglia with frequent neurologic associations including: Mental retardation, Epilepsy, Impaired hearing; deafness, Impaired vision, Emotional disturbances, Behavioural disturbances. [1]

The incidence of CP is 2–3 per 1,000 live births. Prematurity and low birthweight are important risk factors for CP; however, multiple other factors have been associated with an increased risk for CP, including maternal infections, and multiple gestation. In most cases of CP, the initial injury to the brain occurs during early fetal brain development; intracerebral haemorrhage and periventricular leukomalacia are the main pathologic findings found in preterm infants who develop CP. The diagnosis of CP is m`primarily based on clinical findings. Early diagnosis is possible based on a combination of clinical history, use of standardized neuro-motor assessment and findings on magnetic resonance imaging (MRI); however, in most clinical settings CP is more reliably recognized by 2 years of age. MRI scan is indicated to delineate the extent of brain lesions and to identify congenital brain malformations. Genetic tests and tests for inborn errors of metabolism are indicated based on clinical findings to identify specific disorders. Because CP is associated with multiple associated and secondary medical conditions, its management requires a

multidisciplinary team approach. Most children with CP grow up to be productive adults. [2]

Children diagnosed with cerebral palsy will have varying degrees of muscle control, balance, and mobility, depending upon how severe the disorder is. Physical therapy helps with these issues by assisting children with balance, posture, crawling, climbing, walking, and muscle strengthening exercises. [3]

In addition, physical therapy helps children with cerebral palsy to:

Overcome physical limitation obstacles, increase independence, Help expand the range of motion, build muscle tone, Decrease the chances of bone deformity, learn about adaptive equipment and how to use them, increase fitness, flexibility, balance, and posture, Reduce physical discomfort and pain. [3]

A multidisciplinary team approach provides the best model for medical care of children and adults with CP across their lifespan to manage various associated and secondary conditions as well as address support system and psychosocial needs. It is not within the scope of this review to describe management of all conditions in detail; this section provides an overview of selected interventions used in the management of CP. [2.1]

1.2. Problem statement:

According to cerebral palsy incidence and prevalence studies recently conducted, the following are the most current statistics:

Studies on CP patterns in relation to birth weight showed that infants of very low birth weight (VLBW) i.e., less than 1,500 g are 20 to 80 times more likely to develop CP than infants of birth weight of more than 2,500 g. CP are a non-progressive, everlasting disorder of movement, posture, and physical activities, with a prevalence of 2.2-3.3/1,000 in children from developing countries. However, the data in Africa is not well-documented. No published data from Sudan reflects the magnitude of CP and neurological disorders and disabilities. [4]

Recent population-based studies from around the world report prevalence estimates of CP ranging from 1 to nearly 4 per 1,000 live births or per 1,000 children. [5.1]

About 1 in 345 children (3 per 1,000 8-year-old children) in the United States have been identified with CP, according to 2010 estimates from CDC's Autism and Developmental Disabilities Monitoring (ADDM) Network. [5.2]

CP affects approximately 2 to 2.5 children per 1,000 births equating to more than 17 million people worldwide. [7.1]

Epidemiological data is lacking for many Middle Eastern countries; however, studies conducted in Egypt, the Sultanate of Oman, and Saudi Arabia report prevalence of CP ranging from 0.7 to 4.07 per 1,000 live births. [7.2]

In Sudan there is no available data reflecting the magnitude of the CP, neurological disorders and disabilities in the paediatric age-group, but in study conducted in Khartoum, Sudan by Inaam Noureldyme Mohamed, MD, Maha Abdelmoneum Elseed, MRCPCH, and Ahlam Abdalrhman Hamed, MD the participants were 6019 patients they found that their The

majority of the patients had epilepsy that amounted to 52.8%, followed by cerebral palsy (19.1%), congenital anomalies of the central nervous system (6.2%), neuromuscular disorders (3.2%), stroke (2.4%), ataxia and movement disorders (1.9%), assumed genetic syndromes (1.2%), and others. [8]

1.3. Justification:

Cerebral palsy was the second commonest neurological condition seen in the outpatient department. This was similar to the reports from other parts of the world. Many of the affected children require specialized care and rehabilitative services and multidisciplinary team work. In our setup and in spite of the high incidence of cerebral palsy, no facilities exist for the adequate care of these patients. The available rehabilitation centers are mostly nongovernmental charity organizations such as Voluntary Organization for International Co-operation (OVCI) and Cheshire home. Some private centers, that most of the affected children cannot afford, are available in big cities only. To date, there is no governmental Child Development Centre even in the capital of Sudan.

Neurological disorders account for more than 20% of the world's disease burden with a greater majority of people living in Africa affected. The factors that are producing this increased burden include malnutrition, adverse perinatal conditions, malaria, acquired immune deficiency syndrome (AIDS; human immunodeficiency virus HIV/AIDS), meningoencephalitis, demographic transitions, and persistent regional conflicts. Due to late presentation and unavailability of certain diagnostic facilities in resource-limited countries including Sudan, neurology services are very challenging with a significant increase in morbidity and mortality.

1.4. Objectives:

4.1. General Objective:

To evaluate of the effectiveness physical services on children with cerebral palsy in Yumna car Center and Al-tahadi Care Center 2022.

4.2. Specific objective:

1. To determine the treatment options ,available physiotherapy techniques and equipment's that may help improving daily functioning of cerebral palsy's children.
2. To evaluate the role of physical therapy in reducing complications of cerebral palsy in children.
3. To determine the factors that helped in successful of physiotherapy and assesses the numerous barriers of physical activity in children with cerebral palsy.
4. To investigate parent's compliance of practicing physical therapy at home in children diagnosed with cerebral palsy.
5. To determine the challenges that the family of cerebral palsy's child facing.

Chapter (2)

Literature review

Literature review

2.1. Background:

1.1. Definition of Cerebral Palsy:

CP is a non-progressive disorder of posture and movement caused by a defect or insult to the central nervous system. Basically, it is a static encephalopathy with a delayed developmental presentation. Although it may appear to worsen, changes are actually the result of the deficits becoming more obvious as the child grows and matures over time (Nelson & Ellenberg, 1982). The area of the brain affected or damaged is directly reflected by the resulting disabilities. [10.1]

1.2. History/Prevalence:

CP was first described by William Little in 1862 and initially was called Little's disease. It was described as a disorder that appeared to strike children in the first year of life, affected developmental skill progression, and did not improve over time. Little also connected this disorder to a lack of oxygen during birth. Later, in 1897, Sigmund Freud suggested that CP might be rooted in the brain's development in the womb and related aberrant development to factors influencing the developing. [10.2]

1.3. Etiology/Risk Factors:

Many conditions or risk factors associated with CP can be broken down into those occurring in the prenatal, perinatal, or postnatal time periods. CP may result from one or more etiologies, with the actual cause difficult to determine in all cases. In fact, in more than 30% of children, there are no risk factors or known etiology (Rosembaum 2003, Taft 1999). Currently, problems occurring during intrauterine development, congenital disorders, asphyxia occurring in any gestational. [10.3]

Risk factors do not directly cause CP; however, their presence may lead to an increased chance of a child being born with CP. Research has identified some risk factors for CP including:

Premature birth (less than 37 weeks).

Low birth weight (small for gestational age).

Blood clotting problems (thrombophilia).

An inability of the placenta to provide the developing fetus with oxygen and nutrients.

RH or A-B-O blood type incompatibility between mother and baby.

Infection of the mother with Cytomegalovirus (CMV) or other viral diseases in early pregnancy.

Bacterial infection of the mother, fetus, or baby that directly or indirectly attacks the infant's central nervous system.

Prolonged loss of oxygen during the pregnancy or birthing process or severe jaundice shortly after birth. [11]

1.4. Classification of Cerebral Palsy:

One method to classify CP is to describe the predominant motor characteristics, which include spastic, hypotonic, athetotic, dystonic, and ataxic, as well as the topographical pattern of limb involvement, such as monoplegia, diplegia, triplegia, hemiplegia, or quadriplegia. A second method divides CP into two major physiologic classifications, pyramidal (spastic) and extra pyramidal (nonspastic), indicating the area of the brain that has been affected as well as the resulting predominant motor. [10.4]

CP is generally classified according to:

The impact on a person's movement

The parts of the body affected

The severity of the impairment.

Types of CP are usually divided into two main categories:

1. Movement problems or motor types:

Spastic

Dyskinetic

Athetoid

Ataxic

Mixed type

2. Body part involved

Legs only (diplegia)

One arm and one leg (hemiplegia)

All four limbs (quadriplegia)

The body parts involved could be unilateral or bilateral.

1.5. Associated Impairments:

Other conditions are associated with cerebral palsy:

1. Intellectual disability:

Approximately 30 – 50 percent of individuals with CP will be intellectually impaired. Mental impairment is more common among those with spastic quadriplegia than in those with other types of cerebral palsy.

2. Seizure disorder

As many as half of all children with CP have one or more seizures. Children with both cerebral palsy and epilepsy are more likely to have intellectual disability.

3. Delayed growth and development.

Children with moderate to severe CP, especially those with spastic quadriplegia, often lag behind in growth and development. In babies this lag usually takes the form of too little weight gain. In young children it can appear as abnormal shortness, and in teenagers it may appear as a combination of shortness and lack of sexual development. The muscles and limbs affected by CP tend to be smaller than normal, especially in children with spastic hemiplegia, whose limbs on the affected side of the body may not grow as quickly or as long as those on the normal side.

4. Spinal deformities and osteoarthritis:

Deformities of the spine—curvature (scoliosis), humpback (kyphosis), and saddle back (lordosis) -- are associated with CP. Spinal deformities can make sitting, standing, and walking difficult and cause chronic back pain. Pressure on and misalignment of the joints may result in osteoporosis (a breakdown of cartilage in the joints and bone enlargement).

5. Impaired vision:

Many children with CP have strabismus, commonly called “cross eyes,” which left untreated can lead to poor vision in one eye and can interfere with the ability to judge distance. Some children with CP have difficulty understanding and organizing visual information. Other children may have defective vision or blindness that blurs the normal field of vision in one or both eyes.

6. Hearing loss:

Impaired hearing is also more frequent among those with CP than in the general population. Some children have partial or complete hearing loss, particularly as the result of jaundice or lack of oxygen to the developing brain.

7. Speech and language disorders:

Speech and language disorders, such as difficulty forming words and speaking clearly, are present in more than a third of persons with CP. Poor speech impairs communication and is often interpreted as a sign of cognitive impairment, which can be very frustrating to children with CP, especially the majority who have average to above average intelligence.

8. Drooling:

Some individuals with CP drool because they have poor control of the muscles of the throat, mouth, and tongue.

9. Incontinence:

A possible complication of CP is incontinence, caused by poor control of the muscles that keep the bladder closed.

10. Abnormal sensations and perceptions:

Some individuals with CP experience pain or have difficulty feeling simple sensations, such as touch.

11. Learning difficulties:

Children with CP may have difficulty processing particular types of spatial and auditory information. Brain damage may affect the development of language and intellectual functioning.

12. Infections and long-term illnesses:

Many adults with CP have a higher risk of heart and lung disease, and pneumonia (often from inhaling bits of food into the lungs), than those without the disorder.

13. Contractures:

Muscles can become painfully fixed into abnormal positions, called contractures, which can increase muscle spasticity and joint deformities in people with CP.

14. Malnutrition:

Swallowing, sucking, or feeding difficulties can make it difficult for many individuals with CP, particularly infants, to get proper nutrition and gain or maintain weight.

Dental problems. Many children with CP are at risk of developing gum disease and cavities because of poor dental hygiene. Certain medications, such as seizure drugs, can exacerbate these problems.

15. Inactivity:

Childhood inactivity is magnified in children with CP due to impairment of the motor centers of the brain that produce and control voluntary movement. While children with CP may exhibit

increased energy expenditure during activities of daily living, movement impairments make it difficult for them to participate in sports and other activities at a level of intensity sufficient to develop and maintain strength and fitness. Inactive adults with disability exhibit increased severity of disease and reduced overall health and well-being. [11]

Perinatal Intervention for Infants at High Risk of CP:

Identification of children at high risk of CP during the perinatal period is pertinent and can have lifelong implications for the child. Several interventions have recently been introduced to reduce the risk and severity of CP in infants thought to be at high risk:

Cooling: The body temperature of new-born babies who have suffered brain injury due to lack of oxygen around the time of birth is lowered to reduce the impact of the potential brain injury.

Antenatal steroids: Mothers at risk of having a preterm birth are given a single course of steroids.

Magnesium sulfate: Mothers at risk of a very preterm birth are administered magnesium sulfate to help protect their baby from brain injury.

1.6. Diagnosis:

The diagnosis of CP is made largely through clinical observations. The natal history can often raise suspicions and merits closer monitoring. The major signs that collectively can lead to a CP diagnosis are delayed motor milestones, abnormal neurologic examination, persistence of primitive reflexes, and abnormal postural reactions. It is important to remember that although no single abnormal physical sign is diagnostic, clusters of symptoms or evolving abnormal movement patterns [10.5]

1.7. Symptoms of cerebral palsy:

The symptoms of cerebral palsy are not usually obvious just after a baby is born. They normally become noticeable during the first 2 or 3 years of a child's life.

Symptoms can include:

Delays in reaching development milestones – for example, not sitting by 8 months or not walking by 18 months

Seeming too stiff or too floppy

Weak arms or legs

Fidgety, jerky or clumsy movements

Random, uncontrolled movements

Walking on tiptoes

A range of other problems – such as swallowing difficulties, speaking problems, vision problems and learning disabilities.

Signs and symptoms of cerebral palsy can become more apparent over time, so a diagnosis might not be made until a few months to a year after birth. In some cases where the signs and symptoms are mild, diagnosis may be delayed longer. If the doctor or pediatrician suspects your child has cerebral palsy, they will evaluate your child's signs and symptoms, monitor growth and development, review your child's medical history, and conduct a physical exam. Doctor might refer you to specialists trained in treating children with brain and nervous system conditions, such as a pediatric neurologist, pediatric physical medicine and rehabilitation specialist, and child developmental specialist. [12]

Tests:

Doctor might also order a series of tests to make a diagnosis and rule out other possible causes.

1. Brain scans: Neuroimaging methods include:

Brain-imaging technologies can reveal areas of damage or abnormal development in the brain.

These tests might include the following:

MRI. An MRI uses radio waves and a magnetic field to produce detailed 3D or cross-sectional images of the brain. An MRI can often identify lesions or abnormalities in your child's brain. This test is painless, but it's noisy and can take up to an hour to complete. Child will likely receive a sedative or light general anesthesia beforehand.

Cranial ultrasound. This can be performed during infancy. A cranial ultrasound uses high-frequency sound waves to produce images of the brain. An ultrasound doesn't produce a detailed image, but it may be used because it's quick and it can provide a valuable preliminary assessment of the brain.

Computed tomography (CT) uses x-rays to create images that show the structure of the brain and the areas of damage.

Electroencephalogram (EEG)

If your child is suspected of having seizures, an EEG can evaluate the condition further. Seizures can develop in a child with epilepsy. In an EEG test, a series of electrodes are attached to your child's scalp. The EEG records the electrical activity of your child's brain. It's common for there to be changes in normal brain wave patterns in epilepsy. [12]

Laboratory tests:

Tests of the blood, urine or skin might be used to screen for genetic or metabolic problems.

Additional tests:

If your child is diagnosed with cerebral palsy, you'll likely be referred to specialists to test your child for other conditions often associated with the disorder. These tests can identify problems with:

Vision

Hearing

Speech

Intellect Development

Movement

Others medical conditions

The type of cerebral palsy is determined by the main movement disorder experienced, but several movement disorders can occur together. The most common type of cerebral palsy is spastic cerebral palsy, which includes stiff muscles and exaggerated reflexes. Other types of cerebral palsy include movement disorders involving poor balance and coordination (ataxic) and difficulty controlling voluntary muscles (Dyskinetic). After making the diagnosis of cerebral palsy, your doctor may use a rating scale tool, such as the Gross Motor Function Classification System, to determine function and severity of mobility, posture and balance. This information can help in selecting treatments. [12]

Treatment:

Children and adults with cerebral palsy may require lifelong care with a medical care team. Besides a pediatrician or physical medicine and rehabilitation specialist (physiatrist) and possibly

a pediatric neurologist to oversee your child's medical care, the team might include a variety of therapists and mental health specialists. These experts give special attention to needs and issues that are more common in people with cerebral palsy and can work together with your primary care provider. Together you can develop a treatment plan. There is no cure for cerebral palsy. However, there are many treatments options that may help improve your child's daily functioning. Selecting care will depend on his or her specific symptoms and needs, and needs may change over time. Early intervention can improve outcomes. Treatment options can include medications, therapies, surgical procedures and other treatments as needed. [12]

Medications:

Medications that can lessen muscle tightness might be used to improve functional abilities, treat pain and manage complications related to spasticity or other cerebral palsy symptoms.

1. Muscle or nerve injections. To treat tightening of a specific muscle, your doctor might recommend injections of onabotulinumtoxinA (Botox), or another agent. The injections will need to be repeated about every three months. Side effects can include pain at the injection site and mild flu-like symptoms. Other more-serious side effects include difficulty breathing and swallowing.

2. Oral muscle relaxants. Drugs such as baclofen, tizanidine (Zanaflex), diazepam (Valium) or dantrolene (Dantrium) are often used to relax muscles. In some cases, baclofen is pumped into the spinal cord with a tube (intrathecal baclofen). The pump is surgically implanted under the skin of the abdomen.

3. Medications to reduce drooling. One option is Botox injections into the salivary glands. [12]

Therapies:

A variety of therapies play an important role in treating cerebral palsy:

1. Physical therapy. Muscle training and exercises can help your child's strength, flexibility, balance, motor development and mobility. You'll also learn how to safely care for your child's everyday needs at home, such as bathing and feeding your child. Your therapist can provide guidance on how you can continue muscle training and exercise at home between therapy visits. For the first 1 to 2 years after birth, both physical and occupational therapists work on issues such as head and trunk control, rolling, and grasping. Later, both types of therapists are involved in wheelchair assessments. Braces, splints or other supportive devices might be recommended for your child to help with function, such as improved walking, and stretching stiff muscles.

2. Occupational therapy. Occupational therapists work to help your child gain independence in daily activities and routines at home and school and in the community. Adaptive equipment recommended for your child can include walkers, wide-based canes, standing and seating systems, or electric wheelchairs.

3. Speech and language therapy. Speech-language pathologists can help improve your child's ability to speak clearly or to communicate using sign language. They can also teach the use of communication devices, such as a computer and voice synthesizer, if communication is difficult. Speech therapists can also address difficulties with eating and swallowing.

4. Recreational therapy. Some children benefit from regular or adaptive recreational or competitive sports, such as therapeutic horseback riding or skiing. This type of therapy can help improve your child's motor skills, speech and emotional well-being. Both adults and children benefit from regular physical activity and exercise for general health and fitness. [12]

Surgical procedures:

Surgery may be needed to lessen muscle tightness or correct bone abnormalities caused by spasticity. These treatments include:

1. Orthopaedic surgery. Children with severe contractures or deformities might need surgery on bones or joints to place their arms, spine, hips or legs in their correct positions. Surgical procedures can also lengthen muscles and lengthen or reposition tendons that are shortened by contractures. These corrections can lessen pain and improve mobility. The procedures can also make it easier to use a walker, braces or crutches.

2. Cutting nerve fibers (selective dorsal rhizotomy). In some severe cases, when other treatments haven't helped, surgeons might cut the nerves serving specific spastic muscles in a procedure called selective dorsal rhizotomy. This relaxes the muscle in the legs and reduces pain, but can cause numbness.

Other treatments:

As needed, medications and other treatments may be recommended for seizures, pain, osteoporosis, mental health conditions, and problems with sleep, oral health, feeding and nutrition, bladder incontinence, vision, or hearing.

Alternative medicine:

Some children and adolescents with cerebral palsy use some form of complementary or alternative medicine. These are therapies that are unproved and have not been adopted into routine clinical practice.

Assistive devices:

Assistive devices such as computers, computer software, voice synthesizers, and picture books can greatly help some individuals with CP improve communications skills. Other devices around the home or workplace make it easier for people with CP to adapt to activities of daily living. Orthotic devices help to compensate for muscle imbalance and increase independent mobility. Braces and splints use external force to correct muscle abnormalities and improve function such as sitting or walking. Other orthotics help stretch muscles or the positioning of a joint. Braces, wedges, special chairs, and other devices can help people sit more comfortably and make it easier to perform daily functions. Wheelchairs, rolling walkers, and powered scooters can help individuals who are not independently mobile. Vision aids include glasses, magnifiers, and large-print books and computer typeface. Some individuals with CP may need surgery to correct vision problems. Hearing aids and telephone amplifiers may help people hear more clearly. [12]

1.8. Prognosis:

One of the most difficult aspects of this disorder for both parents and health care professionals is the prediction of the future deficits or abilities at the time of diagnosis. Unfortunately, it often is a “wait and see” situation. Many patients with CP have normal intelligence but communication skills are impaired because of Oro-motor, fine motor, and gross motor difficulties; this has potential to affect the child’s success both academically and socially. Survival and quality of life. [10.6]

1.9. Benefits of Physical Therapy on Cerebral Palsy Children:

The types of exercises used vary and have specific benefits for each type of cerebral palsy. Some of the benefits by cerebral palsy type include:

Spastic cerebral palsy — causes stiffness and movement difficulties. However Physical therapy can reduce the muscle tension and jerky movements associated with spastic cerebral palsy.

Exercises such as stretching can even relieve stiffness over time

Athetoid cerebral palsy — leads to involuntary and uncontrolled movements. However, people with Athetoid cerebral palsy use physical therapy to increase muscle tone and gain more control over their movements.

Ataxic cerebral palsy — causes a problem with balance and depth perception. But there are exercises that can improve balance problems faced by those with ataxic cerebral palsy. [10.7]

1.10. Physical Therapist:

Physical therapists also tailor treatment based on the location of movement issues. However, movement issues in children with cerebral palsy can be limited to one half of the body (hemiplegia), the legs (diplegia) or in the torso and all four limbs (quadriplegia). Therefore, therapists prescribe special exercises and routines for hemiplegia, diplegia and quadriplegia that may help the child regain movement in the affected area over time.

Physical therapy can also treat a range of other issues experienced by children with CP, including:

Scoliosis – an abnormal curvature in the spine, common in up to 30 percent of children with cerebral palsy

Lumbar lordosis – a contortion of the lower spine

Pelvic inclination – a protrusion of the pelvis either in the front or rear

Thoracic kyphosis – a contortion of the upper spine

Pelvic rotation – a horizontal contortion of the pelvis

Pelvic obliquity – a contortion of the pelvis at angle

Knee deformity- Pelvic deformities that cause abnormally straight or bent knees.

Shortened Achilles tendon – a shortened tendon that causes issues with walking and standing

Hand and wrist deformities – abnormal flexing in the hand and wrist that prevents development of fine motor skills.

1.10.1. Exercises:

Exercises for cerebral palsy are geared toward treating either high or low muscle tone. High muscle tone causes stiffness and spasticity, whereas low muscle tone causes too much flexibility and weakness.

1.10.2. Improving muscle tone:

Flexibility exercises and massages are often used for children with spastic cerebral palsy; these exercises not only help improve mobility, but also can prevent painful muscle tightening that could require surgical correction. Strength training exercises are used to increase muscle tone in children with Athetoid cerebral palsy.

1.10.3. Assisting posture and walking:

Special exercises are also used to help with walking, posture, transitional movements and sensory impairments like touch and balance. Exercises that emphasize sitting, kneeling, and standing improves posture. Transitional movements are those used by infants that lead to walking, such as rolling over and sitting up

1.10.4. Equipment:

Physical therapists use a range of mobility aids to make therapy more effective. Braces, casts, splints and shoe inserts are types of orthotic equipment used to help with walking, posture and joint mobility.

Physical therapy also often includes the following tools:

Exercise balls

Resistance bands

Free weights

Swimming pools

Hot and cold packs

Electric muscle stimulation

In some cases, electric stimulation is used to improve gait and upper limb function. This therapy uses small electrodes to stimulate certain muscles. [10.8]

1.11. Physical Therapy by Age:

As children get older, their physical therapy needs change. Physical therapists have to adjust and adapt treatments at different stages in development. The most important stages are when the child is a toddler and in the early school years.

Toddlers – Therapy for toddlers tends to focus on playtime. Children in early developmental stages learn and experience a lot through play, making it an important aspect of early therapy. Toddlers

with CP are often reluctant to touch their face or practice certain movements that are necessary for learning and physical development. A therapist can help children overcome this reluctance.

Young children – During school age, roughly ages 5 to 12, children with cerebral palsy experience new movement issues in part because their bodies are growing. Physical therapy can help ensure children grow in a way that is conducive to their motor function. Exercises and orthotics are most commonly used at this age. Therapy also helps instill healthy habits and a proactive mind-set. [10.9]

1.12. Finding a Physical Therapist

Parents looking for a therapist need to find someone who has experience treating children with cerebral palsy. Physical therapists with experience treating CP understand the unique needs of these children and can tailor an individualized treatment regimen.

Physical therapists use observation and a series of standardized tests to measure motor function. They look for specific postures and movements that could be corrected, and develop a physical therapy plan for your child. It can be hard to find a physical therapist that has experience treating children with cerebral palsy. However, parents should never settle for an inexperienced therapist. [10.10]

2.2. Previous studies:

2.2.1. A study conducted in Cape Town, South Africa by Christina Stark, P. Nikopoulou-Smyrni, A. Stabrey, O. Semler, E. Schoenau. To determine the effect of a new physiotherapy concept on bone density, muscle force and motor function in bilateral spastic cerebral palsy children. Performed on 78 children, including whole-body vibration, physical therapy, resistance training, and treadmill training for three months in two periods, and then assessing the total movement at a rate before and after training. After training, bone mineral density (as shown on x-rays), movement rate, muscle strength, and muscle mass increased significantly in children with bilateral spastic cerebral palsy. [13]

2.2.2. A study conducted in Thessaloniki, Greece by Nikos Tsorlakis, Christina Evaggelinou, George Grouios and Charalambos Tsorbatzoudis. To find out the effect of neurodevelopmental therapy (NDT) and differences in its intensity on the overall motor function of children with cerebral palsy (CP). 34 children (12 females, 22 males; average age 7 years 3 months [SD 3 years 6 months], age group 3 to 14 years) participated with mild to moderate spasm and hemiplegia (n = 10), double paralysis (n = 12), and quadriplegia (n = 12). The levels of the gross motor function classification system were: I (n = 10), II (n = 10), and III (n = 14). The double sample, obtained by stratified classification and matching by sex, age and vulnerability distribution out of a total of 114 children with cerebral palsy, was randomly divided into two groups: group A underwent non-destructive testing twice a week and group B five times A. week for 16 weeks. To measure the total motor function, which evaluated the performance of children before and after physical therapy? The T test of the double sample revealed that the overall motor function of children from both groups improved significantly after the intervention (P <0.05). The children in group B performed better and showed much greater improvement than those in group A (P <0.05). The

results support the effectiveness of NDT and underscore the need for intensive application of treatment to children with cerebral palsy. [14]

2.2.3. A study was conducted in South Africa by

Kara Scheepers, Marianne Unger, Suzelle Pronk, Juan P. Carstens, Rulanda Pretorius, Ashleigh C. Robinson and Natasha Fernandes. O critically evaluates and substantiate the best available evidence for the effectiveness of a stem-registration application of kinesiology combined with physical therapy, versus physical therapy alone, on gross motor function (GMF) in children with cerebral palsy. METHODS: Seven databases were searched using the terms CP and/or kinesio tape and/or kinesiology tape and/or recording, physical therapy and/or physical therapy and GMF. Only randomized controlled trials were included and evaluated using the PEDro scale. Revman© Review Manager has been used to combine the effects of GMF for sitting, standing, and activities of daily living. Five randomized controlled trials of Level IIB scoring 3-6/8 on the Pedro Scale were included. A meta-analysis showed that recording was effective for improving GMF in sitting and standing as measured by the gross motor function scale (B) ($p < 0.001$) and (D) ($p < 0.001$), respectively. CONCLUSION: There is moderate evidence to support kinesiology tape applied to the trunk as an effective intervention when used as an adjunct to physical therapy to improve GMF in children with cerebral palsy, especially those with GMF rating scale levels I and II, and especially to improve sitting control. Clinical implications: Kinesiology recording is a useful adjunct to physical therapy intervention in high-functioning children with cerebral palsy. [15]

2.2.4. A study conducted in India by Dr. suraj B kanase the participants were 64 cerebral palsy children aged between 6 months to 5 years, they found that level of gross motor function was improved in the age group of 2 to 4 years and above when compared with age below 2 years after receiving physiotherapy treatment. [16]

2.2.5. The study was conducted in Ankara, by Mintaze KEREM GÜNEL, to rehabilitate children and take a multidisciplinary team approach in dealing with disabilities or disabilities resulting from physical, mental, sensory, perceptual or perceptual disturbances due to prenatal, natal or postnatal causes. Cerebral palsy (CP) is a persistent disorder that affects movement, functional activity, sensory, cognitive, communication, epilepsy, and musculoskeletal problems. Physiotherapy approaches in rehabilitation applications aim to normalize sensory and motor functions, provide normal posture and independent functional activity, regulate muscle tension, improve visual and auditory interactions, support normal motor development and motor control, improve ambulation and endurance, increase the quality of movement, prevent soft tissue, disorders of Postural joints, surgical and orthopaedic support, and finally to prepare the child for the periods of adolescence and adulthood. Setting realistic goals, setting priorities, informing the family, and promoting family participation in physical therapy programs will increase the success of physical therapy for children with cerebral palsy. [17]

2.2.6. A study conducted in North central and southwest Nigeria by M.J Saka, M.A Odunewu, A.O Suka, S.G Akinwale, O.U Anjorin, the participants were one hundred and twenty males and female's children with CP age 2 to 8 years, they found that the Accumulated physiotherapy treatment had beneficial and statistically significant effect on the QoL (mean score of $54.98\% \pm 13.1\%$) of children with CP in North Central and South West Nigeria ($P < 0.05$). It was also found that physiotherapy intervention improves the quality of life of children with cerebral palsy, particularly those who are engaged early enough, and that parental level of education contributes positively to improved quality of life among children with cerebral palsy. [18]

2.2.7. A study was conducted in Bergen, Norway by Anne Brit Sorsdahl, Rolf Moe-Nilssen, Helga K Kaale, Jannike Rieber and Liv Inger Strand. Investigate the quality of functional movement and

daily activities for three hours of physiotherapy that focuses on directed activity within a group framework, five days a week for three weeks. Methods: The design of repeated measures with three basic assessments and two follow-up evaluations has been applied; immediately and three weeks after the intervention. Twenty-two children with hemiplegia (n = 7), double paralysis (n = 11), quadriplegia (n = 2) and ataxia (n = 2), aged 3-9 years, participated. All levels of the Total Engine Function Rating System (GMFCS) and the Manual Power Rating System (MACS) were represented. Parents and professionals were involved in goal setting and training. ANOVA was used to analyze change via repetitive measures. Results: The main effect of time in measuring the initial score was shown; the measure of total motor function - 66 (GMFM-66), the change means to be 4.5 (p <0.01) from the last baseline to the last follow-up assessment. An interaction between time and GMFCS levels was found, which means that children rated in GMFCS I-II levels improved more than children rated in III-V levels. There were no major or reactive effects of the tooth or antispasmodic drugs. Degrees of change in the Pediatric assessment of disability stock (PEDI) ranged from 2.0-6.7, p <0.01 in the area of self-care to the functional skills dimension, and the areas of self-care and mobility to the caregiver's assistance dimension. The children's individual goals were achieved on average, and the average goal achievement scale (GAS) had a T score of 51.3. Unremarkable improved results were shown in the Overall Motor Performance Scale (GMPM) and the Superior Limb Skills Quality Test (QUEST). A significant improvement in GMPM scores was found in GMFM-enhanced elements, not in elements that maintained the same result. The conclusions: improved basic motor abilities and self-care in young children with cerebral palsy after physiotherapy that focused on targeted activity while engaging their local environment, and their need for caregiver assistance in self-care and mobility decreased. Individual training within the context of the group over a limited period of time was possible and well

tolerated. The coherence between the acquisition of basic motor abilities and the quality of movement must be examined. [19]

2.2.8. A study was conducted by Jeong-Yi Kwon, Hyun Jung Chang, Sook-Hee Yi, Ji Young Lee, Hye-Yeon Shin, and Yun-Hee Kim in 2015. To examine whether hippotherapy has a clinically significant effect on gross motor function in children with cerebral palsy (CP). Ninety-two children with cerebral palsy, aged 4-10 years, presenting with variable functions (Gross Motor Function Classification System [GMFCS] levels I-IV) were conducted. Intervention: horse riding therapy (30 minutes twice weekly for 8 consecutive weeks). Outcome measures: Gross Motor Function Scale (GMFM)-88 and GMFM-66 and Pediatric Equilibrium Scale. RESULTS: Measures before and after treatment were completed by 91 children (45 in the intervention group and 46 in the control group). Differences in improvement on all three measures differed significantly between groups after the 8-week study period. The dimensions of GMFM-88 improved significantly after hippotherapy varied by level of GMFCS: The E dimension at the first level, the D and E dimensions at the second level, the C and D dimensions at the third level, and the B and C dimensions at the fourth level. Conclusion: Hippotherapy positively affects gross motor function and balance in children with cerebral palsy of different functional levels. [20]

Chapter (3)
Methodology:

Methodology:

3.1. Materials and methods:

3.1.1. Study design:

This is a facility based, descriptive, cross-sectional study.

3.1.2. Study area:

Study was performed in Yumna Care Center for Physiotherapy and Rehabilitation of Children with Special Needs. Located in Burri, Khartoum, Sudan, west Royal Care. And Altahadi Children Rehabilitation Center, Al Mazad, Al Khartoum North, Sudan.

3.1.3. Study population:

A study that included children with cerebral palsy in Yumna care and Altahadi centers, to assess the rate of motor, sensory, cognitive and musculoskeletal development after receiving physical therapy and rehabilitation for a period of time to increase their quality of life.

3.1.4. Sample size and sampling technique:

The total number of cerebral palsy children in yumna care and altahadi center (103) .by excluding other deformity's (Down's syndrome, kinetics problems), including (cerebral palsy children), where the researcher distributed the study questionnaires to (103) parents, (2) centers and (30) physiotherapist, who returned the questionnaires after filling them in with all the required information.

3.1.5. Data collection method and tools:

The data was collected using a questionnaire through face-to-face interviews.

3.1.6. Data management:

All data has been collected and analysed using SPSS, figures have been built by using Microsoft Office Excel.

3.2. Ethical consideration:

The research has been approved by department of community medicine in Napata collage and also by the supervisor of the research. All students who participated have been informed about the objectives of the questionnaire and written consents were taken with keep confidential. Citations for all information from other researchers have been written.

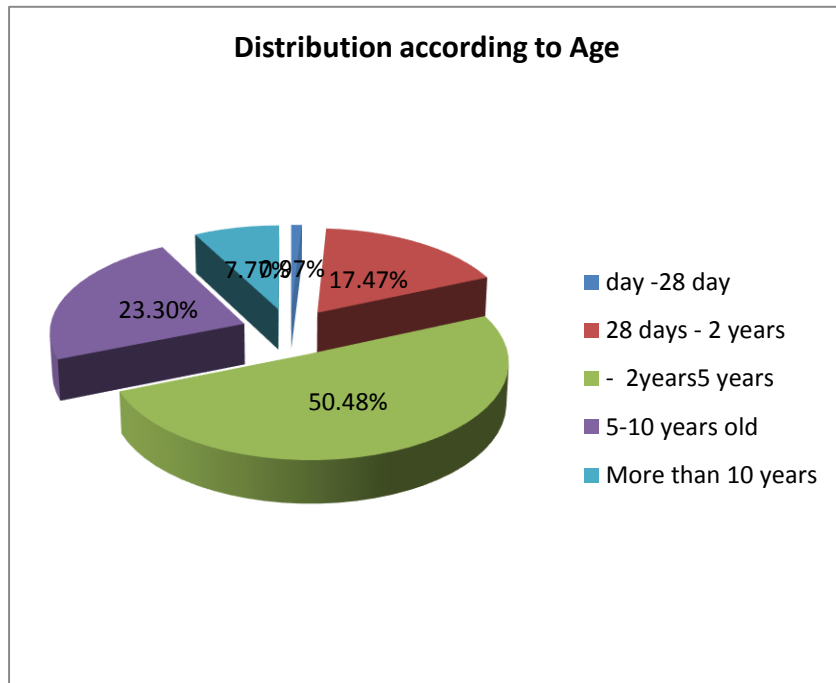
Chapter (4)

Results:

Results:

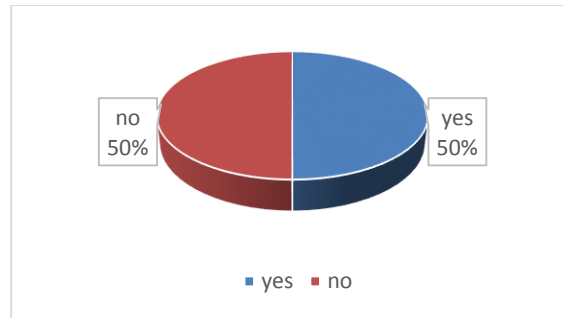
Description of the research sample: -

Figure No (1)



The figure shows the appropriate age for children with cerebral palsy.

Figure (2)



The figure shows the effect of other treatment on the effectiveness of physiotherapy

Figure No (3)



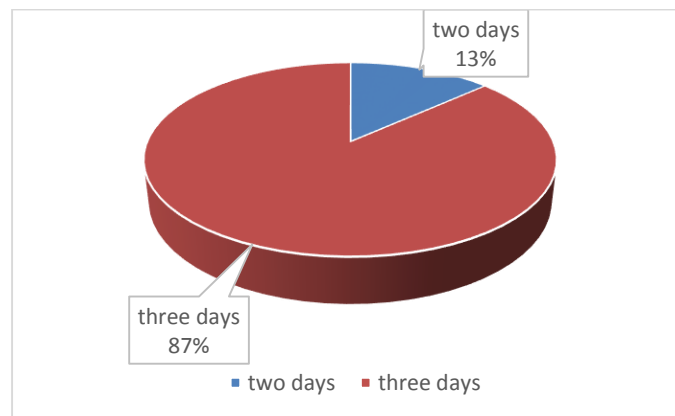
The figure shows the appropriate time for physical therapy for children with cerebral palsy per day

Table No (1)

The Table shows the sufficient time for physical therapy per day for each child

	Frequency	Percentage
onehour	1	3.33%
twohour	13	43.33%
More	16	53.33%
Total	30	100%

Figure No (4)



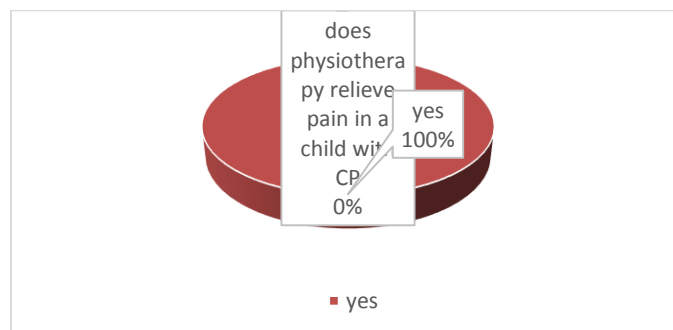
The figure shows the average days per week that most children with cerebral palsy attend

Table No (2)

The table shows the duration of physical therapy for children with cerebralpalsy

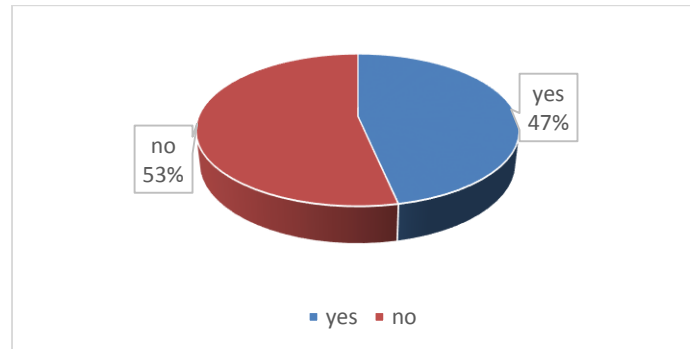
	Frequency	Percentage
according to the health of the child	24	80%
one year	2	6.67%
more than that	4	13.33%
Total	30	100%

Figure No (5)



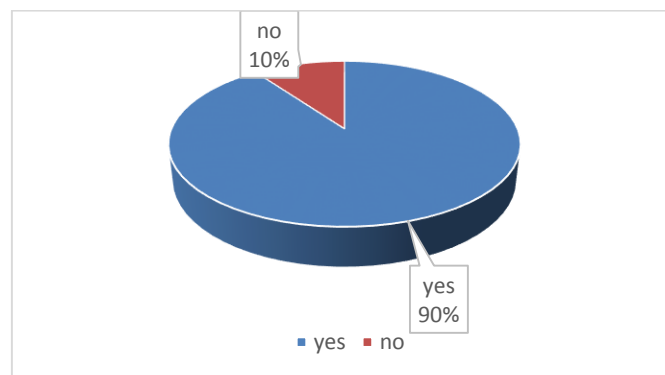
The figure shows the physiotherapists opinion on the effect of physiotherapy in removing the pain in a child with CP

Figure No (6)



The figure shows the effect of physiotherapy in relieving the pain of children with cerebral palsy

Figure No (7)



The figure shows the response to physical therapy between children with cerebral palsy before and after birth

Table No (3)

The table shows the child's disability type

	Frequency	Percentage
kinetic	91	88.35%
audio	3	2.91%
visual	6	5.82%
All of the above	3	2.91%
Total	103	100%

Table No (4)

The table shows in which time the children develop cerebral palsy

	Frequency	Percentage
BeforeBirth	26	25.24%
DuringBirth	33	32.04%
After Birth	44	42.72%
Total	103	100%

Table No (5)

The table shows the time when the child started physical therapy

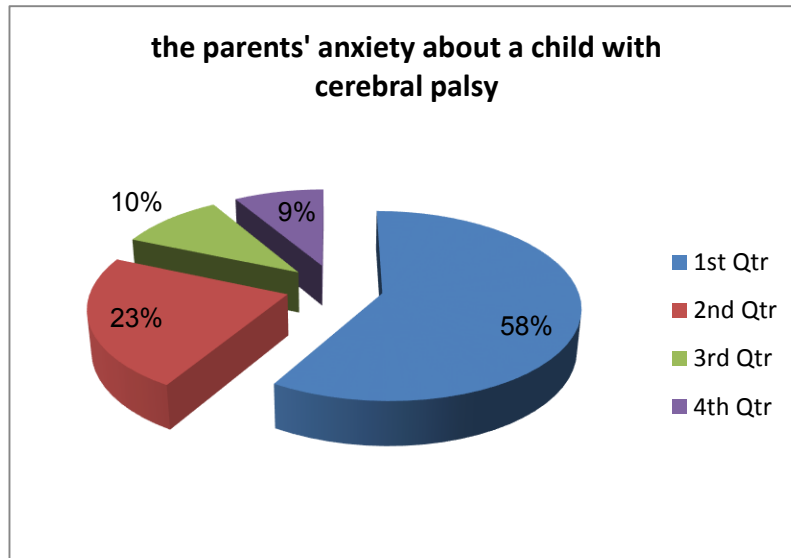
	Frequency	Percentage
early	58	56.31%
late	40	38.83%
Very late	5	4.85%
Total	103	100%

Table No (6)

The table shows the parents' opinion about their children's response to physical therapy

	Frequency	Percentage
High	38	36.89%
Medium	61	59.22%
bad	4	3.88%
Total	103	100%

The figure No (8)



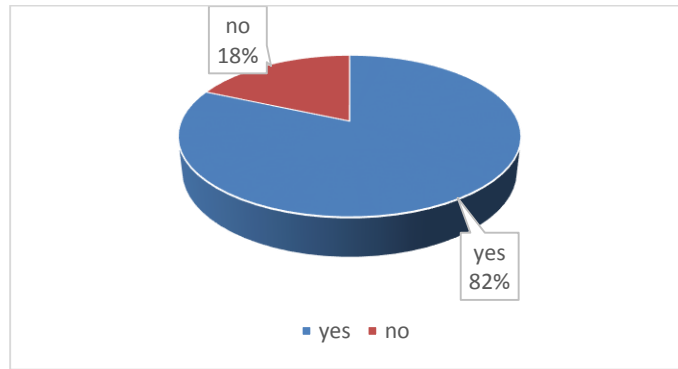
The figure shows the parents' anxiety about a child with cerebral palsy

Table No (7)

The table illustrates the parents' discussion with physical therapists regarding the child's progress

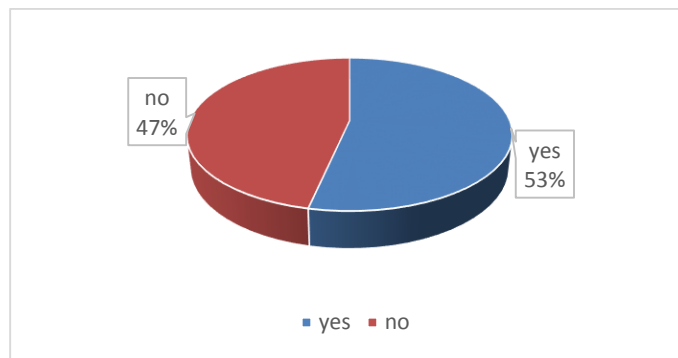
	Frequency	Percentage
yes	98	95.14%
no	5	4.85%
Total	103	100%

Figure No (9)



The figure shows the parents' expectation variable for the speed of response to physical therapy in their children

Figure No (10)



The figure illustrates the parents' opinion regarding the sufficiency of physical therapy for excellent functional performance.

Table No (8)

The table shows the people who help parents of children with cerebral palsy

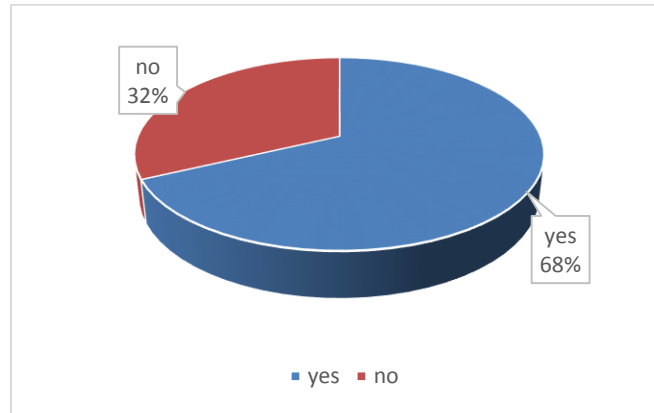
	frequency	Percentage
No one	13	12.62%
your husband	29	28.15%
your family	57	55.34%
others(frinds-neighpoor)	4	3.88%
Total	103	100%

Table No (9)

The table shows the reasons that dallying parents' in appling physical therapy

	frequency	Percentage
Financial problems	73	70.87%
Think that Child Will get better When growing up	8	7.77%
Don't understand the importance of early intervention	22	21.40%
Total	103	100%

Figure No (11)



The figure shows the deal of parents with their child and teaches him

Table No (10)

The table shows the parents educating their children with cerebral palsy

	Frequency	Percentage
	32	65.31%
The lack of qualified schools		
Economic reasons	4	8.16%%
Lack of belief in their right to education	2	4.08%
Not accepted in public schools	11	22.45%
Total	49	100%

Table No (11)

The table illustrates the ways used to educate the children with cerebral palsy

	Frequency	Percentage
Homeschooling	49	47.57%
I don't educate him / her	33	32.04%
He/she goes to receive education in public schools	21	20.39%
Total	103	100%

Table No (12)

The table shows the parents' trust in opinion and tips of the specialist treatment.

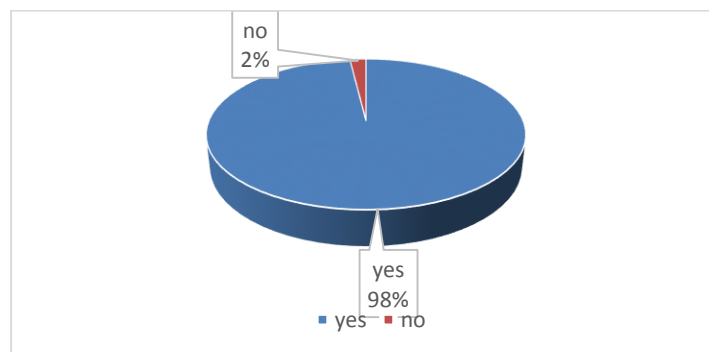
	Frequency	Percentage
yes	89	86.41%
mostly	8	7.77%
Sometimes	6	5.82%
Total	103	100%

Table No (13)

The table shows the impact of the child's psychological state during the treatment session on parents

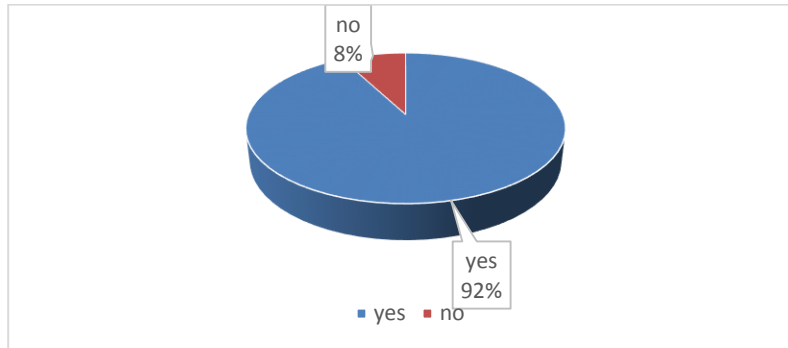
	Frequency	Percentage
yes	99	96.12%
Never	4	3.88%
Total	103	100%

Figure No (12)



The figure shows the positive effect of physiotherapy on children

Figure No (13)



The figure shows the understanding of physical therapists to the difficulties that facing the parents of children with cerebral palsy

Table No (14)

The table shows the ability of parents to apply physical therapy at home

	Frequency	Percentage
yes	83	80.58%
Never	20	19.42%
Total	103	100%

Table No (15)

The table shows the reasons that prevent parents to apply physical therapy at home.

	Frequency	Percentage
I'm afraid that it causes the pain	10	50%
refrain About treatment	1	5%
participation negative in a treatment	6	30%
No explanations	3	15%
Total	20	100%

Table No (16)

The table showsif the parents' understanding variable of physical therapy that physical therapists ask them to apply.

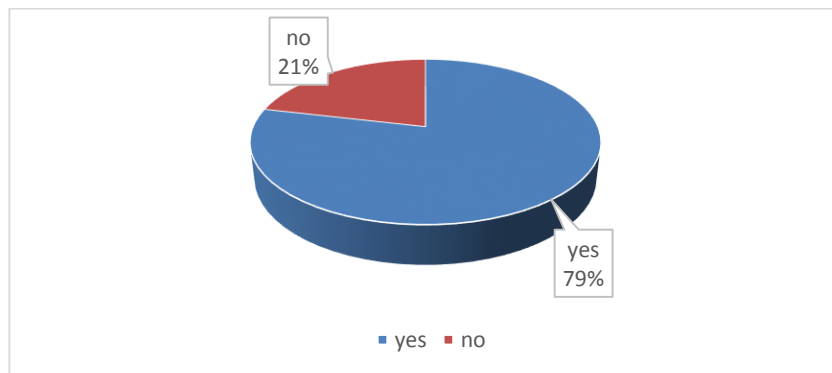
	Frequency	Percentage
yes	67	65.05%
Sometimes	29	28.15%
Never	7	6.80%
Total	103	100%

Table No (17)

The table shows type of physiotherapy that parents wish to apply to their children with cerebral palsy

	Frequency	Percentage
Simple&fun	37	35.92%
It helps in daily activities	66	64.08%
Total	103	100%

Figure No (14)



The figure shows parents agreement to apply physiotherapy at home

Table No (18)

The table showsthe number of theexerciseper/day

	Frequency	Percentage
Daily	23	28.39%
3-4 times in a the week	32	39.51%
1-2 times in a the week	26	32.10%
Total	81	100%

Table No (19)

The table shows the time when parents apply physical therapy to their children with cerebral palsy home.

	Frequency	Percentage
hourDaily	39	37.86%
hours 2	49	47.57%
More than Two hours	15	14.56%
Total	103	100%

Table No (20)

The table shows the Parents depending more on which of training

	Frequency	Percentage
Training of physiotherapist	44	42.72%
Physiotherapist + recommendations of physiotherapist for exercises	58	56.31%
My own training	1	0.97
Total	103	100%

Table No (21)

The table shows the variable of a child's feeling of pain during a physiotherapy session

	Frequency	Percentage
yes	38	36.89%
no	60	58.25%
I don't know	5	4.85%
Total	103	100%

Table No (22)

The table shows the location of pain that children feel during physiotherapy

	Frequency	Percentage
Head	3	4%
abdomen	2	2.67%
the parties Supreme	15	20%
the parties Lower	23	30.67%
noon	21	28%
the chest	3	4%
I don't know	8	10.67%
Total	75	100%

Table No (23)

The table shows the time of children's feeling of pain

	Frequency	Percentage
Daily	28	27.18%
Weekly	37	35.92%
Scarcely	34	33.01%
I don't know	4	3.88%
Total	103	100%

Table No (24)

The table shows the variable of strength of pain felt by a child with cerebral palsy during physical therapy.

	Frequency	Percentage
weakvery	2	1.94%
weak	5	4.85%
Moderate	23	22.33%
strong	63	61.16%
strongvery	5	4.85%
I don't know	5	4.85%
Total	103	100%

Table No (25)

The table shows how parents deal with the pain felt by children with cerebral palsy during physical therapy

	Frequency	Percentage
Rest	10	13.70%
massage	28	38.36%
change Situation/ situation Comforts	2	2.74%
pharmaceutical that No require recipe medical pendulum, ibox ,etc	16	21.92%
Pain oriented physiotherapy	7	9.60%
Consultation of general practitioner	5	6.85%
Consultation of rehabilitation services	4	5.48%
No measures	1	1.37%
Total	73	100%

Table No (26)

The table shows the parents' opinion variable on the cost of physical therapy

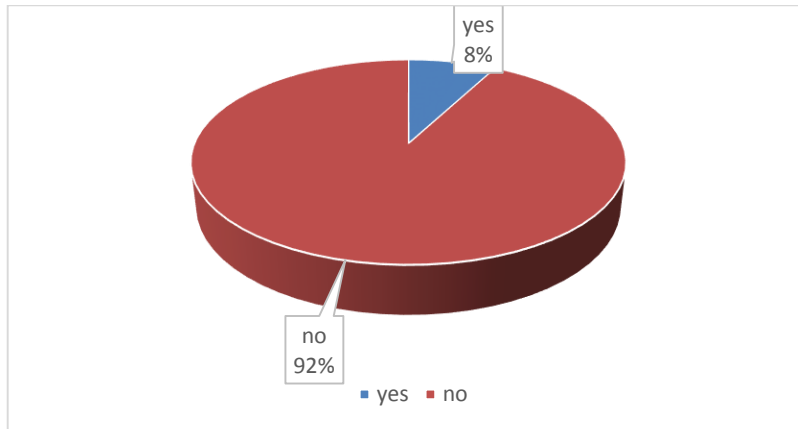
	Frequency	Percentage
High	79	76.70%
Moderate	23	22.33%
low	1	0.97%
Total	103	100%

Table No (27)

The table shows the parents' opinion variable on the importance of physiotherapy

	Frequency	Percentage
Very Necessary	99	96.12%
It's okay	3	2.91%
I don't know	1	0.97%
Total	103	100%

Figure No (15)



The figure shows if the child has a brother with cerebral palsy in the family

Table (28)

The table shows the test of independence between variables quality of life of a child with cerebral palsy and positive results of physical therapy

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	51.011	2	.000

Table (29)

The correlation between (quality of life of a child with cerebral palsy and positive results of physical therapy)

	Value	Approximate Significance
Pearson's R	.523	.000

Table (30)

A test of independence between the variables of multiple treatment options for parents and the speed of outcome of physical therapy

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	6.222	1	.013

Table (31)

Correlation between variables (multiple treatment options for parents and speed of outcome of physiotherapy)

	Value	Approximate Significance
Pearson's R	.471	.011

Table (32)

Independent test between variables (multiple treatment options for therapists and clear results of physiotherapy)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.383	3	.710

Table (33)

Correlation between variables (multiple treatment options for therapists and the results of physiotherapy are clearly visible)

	Value	Approximate Significance
Pearson's R	.025	.899

Table No (34)

The table shows the tools used by physiotherapists in physiotherapy for children with cerebral palsy

	N
Ball	14
Ladder	8
Parallel	4
Triangle	4
Roller	6
Mattress	1
Almitran	1
The cage	1
Squares	1
Specially designed different device	7
Sport machine	7
Splints	6
Stairs	1
Stimulation devices	6
Tennis	2
Exercises	3
Handy devices	6
Shoes	3
Swimming	3
Strings	1
Balance tools	3
Total	88

Table (35)

Independent test between variables (effect of physiotherapy and reduction of complications of cerebral palsy according to parents)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.99	1	.000

Table (36)

Correlation between variables (effect of physiotherapy and reduction of complications of cerebral palsy according to parents)

	Value	Approximate Significance
Pearson's R	.394	.000

Table (37)

Independent test between variables (effect of physiotherapy and reduction of complications of cerebral palsy according to physiotherapist)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	3.802	2	.149

Table (38)

Correlation between variables (the effect of physiotherapy and reducing the complications of cerebral palsy according to the physiotherapist)

	Value	Approximate Significance
Pearson's R	-.016	.937

Table (39)

The test of independent between variables (several factors and succeed physical therapy according to parents)

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	24.81	3	.000

Table (40)

The correlation between variables (several factors and succeed physical therapy according to parents)

	Value	Approximate Significance
Pearson's R	.302	.002

Table (41)

The test of independent between variables (several factors and succeed physical therapy according to physiotherapist)

	Value	Df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.346 ^a	3	.951

Table (42)

The correlation between variables (several factors and succeed physical therapy according to physiotherapist)

	Value	Approximate Significance
Pearson's R	.095	.632

Table (43)

Independent test between variables (factors that limit children's physical activity and their response to physical therapy according to parents)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	1.462	6	.962

Table (44)

Correlation between variables (factors that limit children's physical activity and their response to physical therapy according to parents)

	Value	Approximate Significance
Pearson's R	-.093	.351

Table (45)

Independent test between variables (adherence to physiotherapy at home and speed of physiotherapy results)

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	15.47	10	.116

Table (46)

The correlation between the variables (commitment to physiotherapy at home and the speed of physiotherapy results)

	Value	Approximate Significance
Pearson's R	.086	.389

Chapter (5)

Discussion

Discussion:

The current study is an attempt to estimate the effect of physiotherapy on children with cerebral palsy at Yumna Care Center and Altahadi Center 2022.

The results of this study showed a high effect of physical therapy on children with cerebral palsy, with a total of 103 individuals who participated in the study by filling out questionnaires. The total prevalence rate of cerebral palsy was 100%, and the prevalence was higher among the age group 2 years - 5 years (50.48). The children's ages ranged between (1 day - 10 years) at different percentages (1 day - 28 days) 0.97%, which is considered the lowest percentage (28 days - 2 years) 17.47% (5 - 10 years) 23.3% over 10 years 7.77%.

The average response rate for physiotherapy at the Center is 50% excellent, 50% good.

The rate of pain in children with cerebral palsy before physical therapy and follow-up was 36.89%, and after follow-up and physical therapy, the pain decreased by 100%.

There is a clear deterministic effect of physiotherapy estimated at 90% and 10% without effect.

The majority of types of disabilities are motor disabilities with a percentage of 88.35%, followed by hearing and visual disabilities with a percentage of 5.82%.

50.48% of the parents are worried about their children because of their children's inability to live a normal life, 9.71% the effect of the disease on the child's mental and health condition and so on.

68.93% of parents always discuss the development of their children with cerebral palsy with a physiotherapist. 21.36% discuss it sometimes, 4.85% do not discuss it.

The challenges faced by parents of children with cerebral palsy, who necessitate going to physical therapy, is the difficulty in performing their daily life functions.

55.34% of mothers of children with cerebral palsy receive help from their families, 28.15% are helped by their husbands, while 12.62% do not receive help from anyone.

Many reasons prevent parents from receiving physiotherapy, including 70.87% financial problems, 7.77% believed that the child will improve when he grows up, 21.40% did not know the importance of early intervention for physiotherapy.

With regard to parents seeking to educate children with cerebral palsy, 68% seek to do so, 32% do not.

The reason for not seeking was mostly due to the unavailability of qualified schools at a rate of 65.31%, economic reasons at 8.16%, lack of belief in their right to education 4.08%, and lack of admission to public schools 22.45%.

Physiotherapy affected positively on 98% of the child's cerebral palsy, negatively on 2%.

Physiotherapists understand the difficulties parents face in their lives by 92%, 8% of whom do not.

45.63% of parents can always apply physical therapy to their children at home, while 8.74% apply it sometimes.

35.92% would like to apply simple and enjoyable exercises, while 64.08% of them would like to apply an exercise that helps in daily activity.

For consent to home treatment, 79% said yes, 21% said no.

And about the number of exercises per week daily 28.39%, 3-4 times a week (39.51%), 1-2 times a week (32.10%).

56.31% of parents depend on the recommendations of the specialist in addition to home exercises, but 42.72% of them depend on the training of physiotherapists only, and 0.97% depends on private training.

Regarding the type and location of pain felt by the child during physiotherapy, the lower extremities were 30.67%, the back 28%, the upper extremities 20%, while 10.67% did not know the location of their children's pain.

27.18% of children feel pain daily, 35.92% weekly, 33.01% do not feel it, and 3.88% do not know the answer.

61.16% of children had strong pain, but weak 4.85%.

Actions taken by children to relieve pain, Rest 13.70%, massage 38.36%, over-the-counter medications pendulum, ibox, etc. 21.92%, and others.

The cost of physical therapy for children with cerebral palsy is high. About 76.70% consider the cost of physical therapy high, 22.33% consider it moderate, while 0.97% consider it low.

96.12% of the parents believe that physiotherapy for children with cerebral palsy is very necessary; it is okay, 2.91% think it is okay, while 0.97% do not know the answer.

8 children out of 103 children have siblings with cerebral palsy, 7 of whom are brought to physical therapy.

In a question to physical therapists about the devices used in physical therapy 14 of them use the ball, 8 use the ladder, 7 different specially designed equipment, 7 sports machine, 6 manual equipment, 6 stimulators, 6 scales, 6 cylinder

Chapter (6)

conclusions

6.1. Conclusions:

The results obtained of this study have shown that the quality of life of a child with CP had positive relationship with positive results of physical therapy. For children with CP engaging their families in a home exercise program is the key to successful therapeutic intervention.

The results obtained have shown that the quality of life of a child with CP had moderate positive relationship with positive results of physical therapy.

For children with CP engaging their families in a home exercise program is the key to successful therapeutic intervention.

6.2. Recommendations:

1. We recommend that the Ministry of Health establish more physical therapy centers for children with cerebral palsy.
2. We recommend that the government allocate a monthly stipend for families of children with cerebral palsy to cover their other needs such as health, education, transportation and special nutrition.
3. The Ministry of Education should pay attention to establishing schools specialized in educating and rehabilitating children with cerebral palsy.
4. The Ministry of Social Welfare should pay attention to educating communities on how to deal with children with cerebral palsy.
5. The visual, print and audio media
6. have to highlight the needs of children with cerebral palsy.
7. The administrations of physiotherapy centers and children's families have to work on documenting the improvement of their children with pictures and sounds to convince more families of the need for physical therapy.
8. We recommend that all agencies publish awareness leaflets about the need for early intervention in physiotherapy for children with cerebral palsy.
9. We ask the states to reduce the cost of physiotherapy, if it is not free, so that the benefit is expanded.
10. We recommend the Ministry of Higher Education and universities to establish faculties of physiotherapy and spread its culture to provide the largest possible number of physiotherapists.

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FOR CENTER:

1/ Average ages of children with CP join the center?

2/ Does the center include both children with prenatal and post neonatal cases of CP?

3/ Average numbers of children with prenatal and postnatal CP per year?

4/ Are there children leave the center before they complete their physiotherapy?

(If the answer is yeas) What are the causes?

5/ Does the center provide a neurosurgeon who follows up with the children in the center?

6/ Are there children who stop taking their medication?

(If the answer is yeas) What are the causes?

Does this affect the results of physical therapy for these children? and how?

7/ Are parents committed to physical therapy appointments for their children?

8/ Does the center have means to make people aware of the importance of physical therapy for children with cerebral palsy? * (If the answer is yeas) What are these means?

What is its content?

Are these means available to everyone and easily accessible?

9/ Are there cases in the center that have fully recovered?

10/ What is the recovery rate after physical therapy?

11/ What are the type of disabilities of children found in the centers?

1. Kinetic
2. Kinetic & Sensory
3. Kinetic & Speech
4. Kinetic & Learning
5. Multiple

6/What are the CP diagnosis of children that join the center?

1. Hemiplegia RIGHT
2. Hemiplegia LEFT
3. Diplegia
4. Quadriplegia
5. Choreoathetosis
6. Dystonia
7. Ataxia
8. Other specified
9. Unspecified

12/ What is the most common type of cerebral palsy found in the center?

13/ Is there are specific criteria must be available in the children with CP to join the center?

*** (If the answer is yeas) What are they?**

FOR PARENTS

1/ What is the age of your child?

2/ What is your child's problem?

3/ Is your child cerebral palsy being due to prenatal or postnatal causes?

3/ When did you start your child physical therapy?

4/ What is important to you about your child?

5/ What worried you about your child?

6/ Do you discuss with your physiotherapist what concerns you about the development of the child?

Yes

No

7/ Do you expect a quick result with physiotherapy?

Yes

No

8/ Are you convinced of the idea of physical therapy and its role in treating children with cerebral palsy?

YES () NO() * (If the answer is no):

What is the reason for you to bring your child to find physiotherapy?

1. To satisfy my conscience
2. Because you saw or heard of physical therapy for children with cerebral palsy, and you just came to try it.
3. Because the house is close to the physiotherapy center
4. Other causes

9/ Do you think that physiotherapy alone is enough for the functional development of your child?

Yes

No

10/ What are the problems that face you because you have child with cp?

1. Family does not understand the disability
2. Difficulty in taking care of the child
3. Difficulty in teaching the child
4. Sad feelings about having a disabled child
5. Financial problems
6. Lack of community support
7. Health and rehab system are inaccessible

11/ Who helps you with your child?

1. No one
2. your husband
3. your brothers, sisters
4. Others

12/ What is the impact of society on you and your child?

1. support you and your child
2. has negative attitude towards you and your child

13/ What are the reasons that prevent parents from bringing their children with cerebral palsy to receive physical therapy?

1. Financial problems
2. Think child will get better when growing up
3. gets negative attitude from family/neighbor's
4. Working parents do not have enough time
5. Don't understand the importance of early intervention

14/ Are you able to deal with your child and teach him/her?

15/ What do you do for your child with cerebral palsy who reached the school age?

16/ Do you trust your physiotherapist's opinion and advice?

Yes

No

17/What is your opinion about the physiotherapist of your child?

1. Understanding the needs of the family
2. Preventing stress
3. Communicational skills
4. Knowledge - techniques

17/ Does your child's psychology and performance during the physical therapy session also affect your own psychology?

Yes

No

18/ What are the different aspects of everyday lives of parents of children with cp that have been affected?

19/ Do you think the results of physiotherapy affect your free time positively?

Yes

No

20/ Do you think physiotherapists understand the difficulties you face in your daily life?

Yes

No

21/ Feel able to implement the program at home?

Yes

No

(If Yes) How Do You Feel This?

1. Presence in any treatment
2. Active participation
3. Physiotherapist explanations

(If no)

1. I'm scared not to create pain
2. Abstain from treatment
3. Passive participation in therapy
4. No explanations

22/ Do you understand the exercises that you are asked to do at home?

Yes

No

Moderate

23/ How would you like the exercises to be?

1. Simple
2. Fun
3. Daily activities

24 Do you agree with home treatment?

Yes

No

25/ If you comply how? With treatment

1. Daily
2. 3-4 times a week
3. 1-2 times a week

26/ What does your compliance depend on?

1. The training of the physiotherapist
2. From the program

27/ Did your child had pain during the last month before starting the physiotherapy?

(Single Option)

1/ Yes

2/ No

3/Do not know

28/Which type of pain?

1. Head
2. Abdomen
3. Leg – left
4. Legg – right
5. Hip – left
6. Hip – right
7. Shoulder / arm – left
8. Shoulder / arm – right

9. Back
10. Foot – left
11. Foot – right
12. Do not know

29/ How often?

1. Daily
2. Weekly
3. Seldom
4. Do not know

16/ How strong?

1. Very weak
2. Weak
3. Moderate
4. Strong
5. Very strong
6. Do not know

30/What measures have parents and/or the child taken to relieve or reduce pain?

(Multiple Choice)

1. Rest
2. Massage
3. Change position / rest position
4. Prescription Free Medicines (Paracet, Ibux, etc.)
5. Physical therapy directed at pain
6. Consult the general practitioner
7. Consulted the habilitation service
8. No measures
9. Do not know

31/ The cost of physiotherapy for children with cerebral palsy is?

1. high
2. moderate
3. low

32/ What do you think about the physiotherapy of children with cerebral palsy?

FOR PHYSIOTHERAPISTS:

- 1/ How many hours the children with cp being training in the day?**

- 2/ How many days in the week the children with cp come to physiotherapy center for training?**

- 3/ What is the duration of physiotherapy for children with cp?**

- 4/ How the therapist creates a treatment plan for children with cp? (Depending on what).**

- 5/ What are the types of exercise programs for children with cerebral palsy? and each program on which focusing?**

- 6/ What are the techniques and equipment's is used to improve movement for children with cp?**

- 7/ To which degree the physiotherapy can improve the child's specific issues?**

- 8/ Is there is creation of pain during or after physiotherapy that Abstain from treatment?**

- 9/ If the child with cp come complain of pain, is that pain is relived after completion of physiotherapy?**

- 10/ With multiple problems that the children of CP come with, what are the most of these problems show rapid and obvious improvement (respond) with physiotherapy?**

- 11/ What are the factors that effects on the successful of physiotherapy on children with cerebral palsy?**

- 12/ What are the outcomes measures that were used to assess the effects of exercise program?**

13/ What are the supplementary exercises for children with cp performed at home?

14/ Is the intense physical therapy intervention in children with cerebral palsy show improvement on gross motor function, community walking and participation?

15/ Is the response to physical therapy in the specified period of time associated with the condition of the child with the CP if it was prenatal or postnatal?

16/ What is the opinion of physiotherapist about parents of children with cerebral palsy?

1. compliance
2. Care ability
3. Stress
4. Anxiety