



# **Musculoskeletal Disorders in Mothers with Children with Cerebral Palsy in Pediatric Rehabilitation Center in Khartoum – Sudan 2022**

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**Abstract**

**Background:** Cerebral palsy (CP) is characterized by impaired motor development and cognitive, sensory, and communicative deficits. The disorder develops when the immature brain responds for a variety of reasons. Long-term care and support are especially important for the mother with cerebral palsy child, as well as the whole family.

**Objectives:** The study aims to recognize the Prevalence of musculoskeletal disorders among mothers of a child with cerebral palsy

**Material and Methods:**

A hospital-based descriptive cross-sectional study was conducted in three centers in Khartoum, Sudan (Shaheen pediatric rehabilitation center, Youmna care center, and Roya physiotherapy clinic in Khartoum, Sudan).

51 Sudanese patients and 51 mothers aged between 16 to 50 years were involved in the study. Statistical Package of Social Sciences (SPSS) version 19 was used for data analysis.

**Result:** The most common musculoskeletal disorder in mothers who have cerebral palsy children is low back pain, but researchers found that neck pain is the most common, with neck pain 20% > low back pain 19%

**Conclusion:**

- The standard age of a mother with musculoskeletal disorders ranges between (27-33) years.
- The most Musculoskeletal disorder of the mother is neck pain.
- Children with CP who depend on their mother fully or partially have the same effect of musculoskeletal disorders.

**Keywords:** Cerebral Palsy, Khartoum, Musculoskeletal.

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## Introduction

Cerebral palsy (CP) is characterized by impaired motor development and cognitive, sensory, and communicative deficits. The disorder develops when the immature brain responds for a variety of reasons. Long-term care and support are especially important for the mother with a child with cerebral palsy, as well as whole family. Having a child with a disability is about some specific culture. Personal care, transportation, daily activities, and treatment during which they may be exposed to physical trauma and heavy loads. Chronic physical loading can lead to musculoskeletal problems, and there are a limited number of studies in the literature evaluating musculoskeletal pain and associated factors observed in children. The musculoskeletal system of these mothers is an essential component that is provided support and technique by these mothers. Necessary for the quality of care and rehabilitation support provided to healthy mothers. (1)

The mothers who have children with CP provide active support to their children in terms of personal care, transfer, daily life activities, and treatment, during which they may be exposed to physical trauma and heavy loads. It is known that chronic physical loading could produce problems in the musculoskeletal system. There are a limited number of studies in the literature evaluating musculoskeletal system pain and the related factors that are observed in the mothers of children with cerebral palsy." Knowing the extent and the risk factors of the problems in the musculoskeletal system of these mothers is essential to determine the support and the approach to be provided to this group. It is also essential for the quality of the care and the rehabilitation support that is provided to the healthy children of these mothers. Current study aimed to determine musculoskeletal system pain and the related factors observed in mothers of children diagnosed with cerebral palsy. (1)

A large number of mothers who have children with cerebral palsy suffer from Musculoskeletal Disorders and low back pain as a result of carrying their children. Therefore, our study determines the frequency of mothers.

Cerebral palsy (CP): A persistent, non-progressive disorder resulting from brain insult or injury in the antenatal, perinatal, and postnatal period, is the major developmental disability affecting function in children. It is characterized by an inability to naturally control motor functions, and it has the ability to influence a child's general development by affecting a child's ability to explore, speak, learn, and be independent. Effective management can improve the quality of life of the child and family. (2)

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A drop in muscle size is associated with cerebral palsy, but previous research describes a deficit only in a few muscles. It is unknown how much muscle volume is lost in the extremities. (3)

Abnormal brain development or developing brain damage lead to cerebral palsy, which happens at birth, early infancy, and before a child is born with an unknown cause. Some factors lead to brain development problems:

Gene mutation, blood supply disruption to the developing brain, brain bleeding in newborns or womb, infections in the infants which lead to inflammation in or around the brain, infant traumatic head injury, and birth-related asphyxia.

The symptoms vary from child to child and can affect the whole body or one or two limbs, or even one side of the infant's body.

**Signs and symptoms include:**

Problems with movement and coordination, speech and eating problems, muscles stiffness or spasticity, which is the most common movement disorder, muscle tone variations, ataxia, and imbalance, jerky, slow, and writhing movements, one side of the body favoring, walking difficulty, speech development delay, speaking difficulty, sucking, chewing, or eating difficulty, swallowing problems, difficulties in learning, growth delay, brain damage leads to epilepsy, hearing difficulty, vision problems, problems in bladder and bowel, constipation, and mental health conditions.

Cerebral palsy doesn't change with time and age, and some symptoms become less or more or even less apparent. Muscle shortening and rigidity can worsen if not treated aggressively (4)

A common cerebral palsy type is spastic cerebral palsy, which includes stiff muscles and exaggeration of reflexes.

Other cerebral palsy types include movement disorders (poor balance and coordination (ataxic)) and difficulty controlling voluntary muscles (dyskinetic). (5)

Risk factors such as inbreeding, maternal distress, preterm birth, birth asphyxia, low birth weight, multiple pregnancies, neonatal spasticity, jaundice, postpartum CNS infection, and brain injury were recorded. (6)

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**Musculoskeletal disorders of mothers who have CP children:**

Musculoskeletal disorders (MSDs) (7, 8), Neck pain (9,10), Shoulder pain (11,12,13), Elbow pain (14), Wrist pain (15), Low back pain (16), Hip pain (17-20), Knee pain (21-23), Foot pain (24,25)

**Objective:**

To determine the frequency of musculoskeletal disorders among mothers of children with cerebral palsy, evaluate if the mother's career is affected by musculoskeletal disorders, assess types of musculoskeletal disorders are common in mothers of children with cerebral palsy, determine mother pain and the pain intensity, and to evaluate the level of independence of child on his mother.

**Materials and Methods:****Study design and Study area:**

A hospital-based descriptive cross-sectional study was conducted in three centers in Khartoum, Sudan (Shaheen pediatric rehabilitation center, Youmna care center, and Roya physiotherapy clinic in Khartoum, Sudan).

**Study population:** 51 Sudanese patients, 51 mothers aged between 16 to 50 years, were involved in the study.

**Inclusion criteria:** Mother with musculoskeletal disorders and suffer from pain after getting a cerebral palsy child.

**Exclusion criteria:** Mother who has musculoskeletal disorders before getting a cerebral palsy child.

**Ethical considerations**

The university administration granted permission, verbal and written approval from the head department to conduct the current study will obtain. Verbal and written consent from the mothers.

**Data analysis:** Statistical Package of Social Sciences (SPSS) version 19 was used.

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## Results

25 (49 %) of the participants were aged less than 32 years old, and 26 (51 %) were older than 32 years old. 96.1 % of women in the study were married, while others were divorced. Regarding body mass index, 62.4 % of women in the study had average body mass index, 33.7 % were overweight, and 3.9 % were underweight.

Regarding the number of children, 11.8 % of women in the study have CP children only, 49 % of women have less than three children, one of them CP children, and 39.2 % have three children or more, including CP children.

3 (5.9 %) of mothers have more than one CP child. 14 (27.5 %) of the women in the study had jobs while others were not working, and half of them (7 women) not carrying their CP children caused problems in the musculoskeletal while others were not.

19 (37.3 %) mothers didn't have any musculoskeletal problems before getting a cerebral palsy child, and 32 (62.7 %) mothers had a musculoskeletal pain before calling a cerebral palsy child.

The majority of mothers (64.7 %) suffer from neck pain, while 41.2 % suffer from shoulder pain. (Table 1)

No statistical significance between the dependence of the CP child on his mother and low back pain, while there is statistical significance between the reliance of the CP child on his mother and low back and neck pain, P-value (less than 0.005). 18 (35.3 %) women have neck pain due to dependence on their children on them.

There is no relationship between shoulder pain and the dependency of a child on his mother, despite 30 (58.8 %) women having shoulder pain due to dependence of their children on them.

There is no relationship between Elbow pain and the dependency of a child on his mother despite there being 16 (31.4 %) women having elbow pain due to complete child dependency.

There is no relationship between Wrist pain and the dependency of a child on his mother, despite 14 (27.5 %) women having wrist pain due to complete child dependency.

There is no relationship between hip pain and the dependency of a child on his mother, despite 16 (31.4 %) women having hip pain due to complete child dependency.

There is no relationship between Knee pain and the dependency of a child on his mother, despite 17 (33.3 %) women having hip pain due to full child dependency.

There is no relationship between foot pain and the dependency of a child on his mother, despite 18 (35.3 %) women having foot pain due to complete child dependency.

31 (60.8 %) mothers felled pain during daily activities, 11 (21.6 %) felled pain during the day, 6 (11.8 %) during the night, and 3 (5.8 %) felled pain in the morning.

The degree of pain felled by mothers was severe for 5 (9.8 %), moderate for 27 (52.9 %), and mild for 19 (37.3 %). (Table 2)

Only 3 (5.9 %) mothers did visit physiotherapists, while the other 48 (94.1%) didn't see physiotherapists. (Table 3)

The majority (80.4 %) of CP children were less than seven years old, while others were more than seven years old. (Table 4)

The majority (51 %) of CP children were of average weight, 41.2 % were underweight, and 7.8 % were overweight. (Table 5)

There are 13 mothers (25.5%) with hemiplegic paralysis, while ten mothers (19.7%) have quadriplegic. (Table 6)

There are 19 children (37.3 %) who entirely depend on their mothers, 19 children who are partially dependent (37.3 %), and there are 13 children (25.4 %) who do not depend on their mothers (Table 7)

Type of pain	Frequency (%)
Neck	33 (64.7)
Shoulder	21 (41.2)
Elbow	4 (7.8 )
Wrist	10 (19.6)
Low back	32 (62.7)
Hip	1 (1.7 )
Knee	2 (3.4 )
Feet	1 (1.7)

**Table 1:** Frequencies of pain type in women with CP children (n=51).

Degree of pain	Frequency (%)
Mild	19 (37.3 %)
Moderate	27 (52.9 %)
Severe	5 (9.8 %)

**Table 2:** Degree of the pain felled by mothers (n=51).

Visit physiotherapist	Frequency (%)
Yes	3 (5.9)
No	48 (94.1)

**Table 3:** Mothers visit a physiotherapist for their pain (n=51).

CP child age (years old)	Frequency (%)
Less than 7	41 (80.4)
More than 7	10 (19.6)

**Table 4:** CP child age (n=51).

CP child weight	Frequency (%)
Overweight	4 (7.8)
Normal	26 (51)
Underweight	21 (41.2)

**Table 5:** Weight of CP child (n= 51).



<b>Paralysis type</b>	<b>Frequency (%)</b>
Hemiplegic	13 (25.5)
Hemi paresis	9 (17.6)
Quadriplegic	10 (19.7)
Quad paresis	9 (17.6)
Mono pelagic	2 (4)
Para pelagic	8 (15.6)
<b>Total</b>	<b>51 (100)</b>

**Table 6:** CP children paralysis type:

<b>Level of dependence</b>	<b>Frequency (%)</b>
Full dependence	19 (37.3)
Partial dependence	19 (37.3)
Not dependent	13 (25.4)
<b>Total</b>	<b>51 (100)</b>

**Table 7:** Level of independence of the child:

## Discussion

The presented study showed that the incidence of musculoskeletal disorders common for mothers has children with cerebral palsy in the age group between (33-37) years old, which is same as done by Glinac, A. (31) and the study done by Ilknur Albayrak and et al. which was performed on 101 mothers who had children with CP (43 girls and 58 boys) and 67 mothers who had a healthy child as the control group, the mean age was  $34.93 \pm 8.7$  years for the mothers in the CP group and the mean age was  $34.28 \pm 7.51$  years

for the mothers in the control group. (32) “No dissenting studies were mentioned due to the difference in the size of the sample and the location of the study.

Our study showed that the incidence of neck pain was the most common (20%), more than Low back pain (19%) in mother's have children with cerebral palsy. This result is opposite to a study done by Khan, S. and et al. study, which found that the frequency of the disorders is followed: low back pain was 80%, neck pain 56.3%, appropriate attention, and precautionary measures should be taken to minimize these musculoskeletal disorders. (26) This difference might be attributed to the variation in methods of diagnosis between countries.

In the area of CP paralysis, our study showed that the incidence of hemiplegia was the most common (25.5%), and less common were monoplegia and mono paresis (2%) in children with cerebral palsy. This result opposite to a study done by Kavlak E et al., which were found that (44%) had tetraplegia, and one child (1%) had mono paresis. (32,34) This difference between studies may be related to variations in geographical areas.

The presented study showed that incidence of 2 mothers who weight under average weight, 32 (62.7 %) mothers they have average weight, and there were 11 (21.6 %) mothers overweight, and 6 (11.8%) mothers their weight obese; this indicates that there was no relationship between mother's weight and musculoskeletal disorders that affect a mother who has a child with cerebral palsy. In this area, there were no previous studies in line with or opposite our findings.

Regarding jobs, our study found that 14 (27.5%) of mothers have jobs, and 37 (72.5%) mothers do not have a job. This indicates that there was no relationship between the mother's job and musculoskeletal disorders that affect a mother with a child with cerebral palsy. There are no previous studies in line with or opposite this study.

Regarding the age of CP child, 32 (62.7 %) mothers have a child aged between (2 to 4), 9 (17.6%) mothers they're a child aged between (5 to 7), 8 (15.7%) mothers they're a child aged between (8 to 10), and 2 (3.9%) mothers their child aged between (11 to 13). There are no previous studies in line with or opposite to this study cause most research studied cerebral palsy children only; they did not focus on the relationship between children's age and their mother's injury.

## Conclusion

- The typical age of mothers with musculoskeletal disorders ranges between (27-33) years.
- The most Musculoskeletal disorder in mothers is neck pain
- Children with CP who depend on their mother fully or partially have the same effect of Musculoskeletal disorders.

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