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Investigating Low Back Pain Amongst Caregiving Mothers of Children with Cerebral Palsy at NIRM, Islamabad

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ABSTRACT

Background: This study was conducted to determine the prevalence of low back pain among mothers of children with cerebral palsy. To determine the frequency of low back pain among mothers of children with cerebral palsy and to evaluate the severity of symptoms and impact of CP children on mother's LBP. **Material and Methods:** An observational cross-sectional study was performed using demographic data, the Numeric Pain Rating Scale tool was used to assess the severity of back pain, and the ODI questionnaire was used to assess the low back pain disability. The 105 study participants were mothers visiting NIRM for their cerebral palsy children rehabilitation in the Physical Therapy department. The ODI tool assessed the restrictions in daily activities due to low back. Data was analyzed through frequency tables in SPSS version 22. **Results:** Low back pain is prevalent ($n=3$, mean+SD, $p<0.05$) among mothers of children with cerebral palsy in outdoor visitors of NIRM, Islamabad. **Conclusion:** This study concluded a statistically high prevalence of low back pain and functional limitations, affecting the quality of life and daily life activities

Keywords: Numeric Pain Rating Scale; Low Back Pain; Oswestry Disability Index; Functional Disability; Cerebral Palsy

INTRODUCTION

Cerebral palsy (CP) refers to a group of persistent motor and postural disorders that cause activity limitations that are thought to be no progressive disorders that have arisen in the developing fetal or infant brain. CP is a group of permanent movement disorders often requiring extensive caregiving and support. Motor disorders in cerebral palsy are often associated with disorders of sensation, perception, cognition, communication, behavior, epilepsy, or secondary musculoskeletal problems [1]. A child with cerebral palsy needs constant care, frequent medical examinations, and continuous physical and educational rehabilitation therapy, and it influences family dynamics, especially mothers because they are carriers of care, do most of the work related to the child and spend most of their time with the child [2, 3]. CP is the most common neuromuscular disease in paediatric patients. It affects posture and movement and is already noticeable in early childhood. The incidence rate of 2 to 2.5 cases per 1000 live births has been relatively constant since 1970 [4].

Several prenatal factors increase the risk of cerebral palsy. Everyday clinical situations include the preterm infant with an

abnormal cranial ultrasound, the term infant with suspected prenatal hypoxic-ischemic encephalopathy (HIE), and the infant with neonatal seizures and a cortical arterial infarction. These children are at increased risk of developing CP [5]. In the context of childhood disabilities, there is a growing acceptance that family-centred services are desirable and the best-established practice of service providers. While the family-centred approach is crucial, it can increase demands on the family members, requiring them to participate actively in their childcare. Without a doubt, grooming is a part of the life parent of a child. However, one can easily see how providing a high level of care to a child with extended short-term functional restrictions, such as cerebral palsy (CP) [6]. Children with CP struggle with various physical problems, such as weakness, stiffness and clumsiness, and social and emotional issues, such as peer rejection, depression, frustration, anxiety, and Fury [7].

Low back pain is a prevalent and debilitating health issue affecting a significant portion of the global population. While it can impact people of all ages and backgrounds, its prevalence and consequences can be significantly pronounced among mothers who care for children with CP. Two studies have assessed the prevalence of LBP with parenthood. Finkelstein rated police officers and firefighters with LBP; the noted results were a higher prevalence of LBP when the civil servant had many children. The second study by Rossignol et al. primarily examined occupational LBP risk factors in aircraft assemblers and found that parenthood was associated with an increased prevalence of self-reported work impairments [8, 9]. Chronic low back pain is the most common care-related disability among mothers of children with Physical impairments. It is also the most common cause of disability in these mothers and causes undesirable effects on quality of life. Bending, lifting, and repetitive movements as work-related physical factors have been reported to lead to back pain. In this regard, caring activities require various exercises such as bending, twisting, lifting and flexion or extension of body parts, mainly around the lumbar spine, as shown in Figure 1. These movements result in physical stress, which can often lead to injury [10].

Children with cerebral palsy have long-term care needs that vary and often exceed the usual needs of typical children. Because of this, children with cerebral palsy depend on caregivers/parents and, most commonly, mothers for day-to-day support. The everyday lives of mothers with children affected by cerebral palsy are often more involved as they are usually the primary caregivers and are more likely to experience emotions and challenges [11]. Many children with CP may have limited self-care functions such as feeding, bathing, dressing, grooming, and walking and may experience communicative, sensory, and intellectual impairments. Most children with CP are cared for by their mothers, who are the primary caregivers of their children in developing countries. Nursing involves extensive activities such as lifting and turning, bathing, assisting with toileting, falling asleep, dressing and assisting with transfers. Manual handling can be physically taxing for mothers and contribute to a greater degree of pain-deficient back pain [12-14].

Raising a child with CP requires many additional responsibilities from the parents, especially the mother, and thus significantly affects the family's quality of life. Most often, the mother has to quit her job. The day-to-day care of a paralyzed child always involves overcoming specific external barriers associated with personal hygiene and performing daily physical exercises or assisting the child in locomotion, which often involves lifting and carrying the child. The problem grows over time as the child develops and changes in weight and height, increasing physical stress. Repeatedly handling such loads over many years, often in non-ergonomic positions, is the source of the so-called slow overload, which is often the cause of non-specific back pain [15, 16]. The current study explored the prevalence of low back pain among mothers of children with Cerebral Palsy, shedding light on the unique challenges they face and the importance of addressing this issue within the context of maternal well-being and caregiving responsibilities. Understanding this prevalence can guide healthcare professionals, researchers, and policymakers in developing effective strategies to support and improve the quality of life for these mothers.

The current study aims to determine the prevalence of low back pain in mothers of children with Cerebral Palsy. Here we determine the frequency of low back pain in mothers of children with Cerebral Palsy and assessed the risk factors of back pain associated with dealing with CP children among mothers.

MATERIALS AND METHODS:

Current study is a cross-sectional observational study. Data was collected from the National Institute of Rehabilitation Medicine (NIRM) Islamabad, Pakistan. The study population was mothers of children with CP. A sample of 105 mothers was taken through non-probability convenient sampling. Our inclusion criteria were mothers having children with CP, absence of severe or chronic medical condition and absence of previous back surgery. Exclusion criteria was mothers with a history of chronic illness, mothers

with history of musculoskeletal disorders and mothers who were not involved in the primary care of the child. Data collection tool was pre-structured questionnaire with demographic information, Numeric pain rating scale and modified OSWESTRY low back pain disability index V(ODI). The data was analyzed with the statistical analysis software (SPSS version 22). Research permission was taken from the ethical research committee of Shaheed Zulfiqar Ali Bhutto Medical University and Bashir Institute of Health Sciences to conduct the study. The participants signed the mandatory informed consent before the research started to approve their participation in the study.

RESULTS:

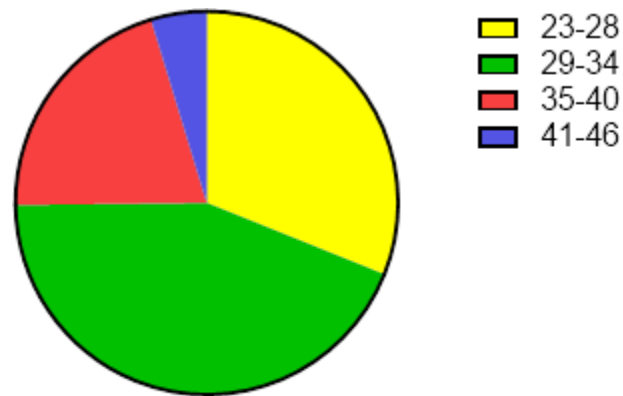
The manuscript documented all the outcomes as the mean and the standard deviation (SD). One-way ANOVA was analyzed to check the significance level of differences between and among the groups. The probability values with $p \leq 0.05$ were considered to be significant.

Demographic Data:

Among 105 recruited participants, the ages ranged from 23 to 46. The age range 29-34 was the most frequent age, i.e. 43.8% (46), followed by the age range 23-28, i.e. 31.4% (33) respectively, as shown in Table 1, Figure 2.

TABLE 1: Shows mothers' age frequency and percentage ($n=3$, mean+SD, $p \leq 0.05$)

Participant's age and frequency		
Age (Years)	Frequency (mean $\pm$ SD)	Percentage (%)
23-28	33 $\pm$ 0.02	31.4
29-34	46 $\pm$ 0.04	43.8
35-40	22 $\pm$ 0.01	21.0
41-46	4 $\pm$ 0.11	3.8
Total	105 $\pm$ 0.02	100



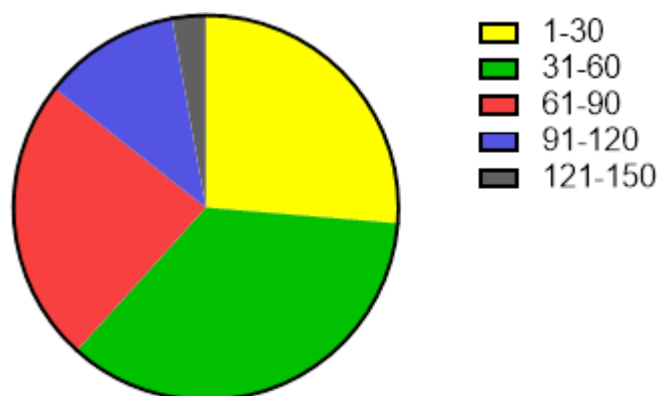
Total= 100

Figure 2: Pie chart of mother's age percentage (n=3, mean+SD, $p \leq 0.05$).

The child's age ranges from 1 month to 150 months. The age ranges from 31 (2.5 y/o) to -60 (5 y/o) months, being the most frequent age, i.e. 35.2 % (37) shown in Table 2, Figure 3.

TABLE 2: Shows the child's age, frequency and percentage (n=3, mean+SD, $p \leq 0.05$).5

Participant's age and frequency		
Age (Years)	Frequency (mean $\pm$ SD)	Percentage (%)
1-30	28 $\pm$ 0.11	26.7
31-60	37 $\pm$ 0.01	35.2
61-90	25 $\pm$ 0.06	23.8
91-120	12 $\pm$ 0.02	11.4
121-150	3 $\pm$ 0.03	2.9
Total	105 $\pm$ 0.03	100



Total= 100

Figure 3: Pie chart of child's age, frequency percentage (n=3, mean+SD, $p \leq 0.05$).

In the current study, 81 participants are housewives, and 10 do jobs. At the same time, 14 study participants left their jobs, as shown in Table 3, Figure 4.

TABLE 3: Shows frequency of mothers' job percentage (n=3, mean+SD, $p \leq 0.05$).

Frequency of Mothers' Job		
Job-status	Frequency (mean $\pm$ SD)	Percentage (%)
NO	81 $\pm$ 0.10	77.1
YES	10 $\pm$ 0.03	9.5
Left Job	14 $\pm$ 0.02	13.3
Total	105 $\pm$ 0.11	100

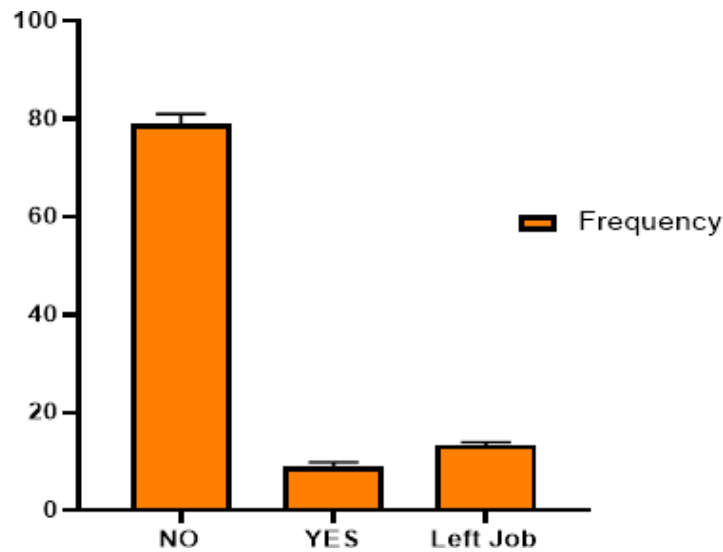


Figure 4: Graphical presentation of the frequency of mothers' jobs ($n=3$, mean $\pm$ SD, $p\leq 0.05$).

A numeric pain rating scale measured pain Intensity. 1.9% (2) participants lie in no pain, 19% (20) in mild pain, 21.9% (23) in moderate pain and 57.1% (60) in severe pain shown in Table 4, Figure 5.

TABLE 4: Shows frequency of pain intensity ($n=3$, mean $\pm$ SD, $p\leq 0.05$)

Frequency of Pain Intensity		
Pain Intensity	Frequency (mean $\pm$ SD)	Percentage (%)
No Pain	2 $\pm$ 0.04	1.9
1-3=mild	20 $\pm$ 0.05	19
4-6=moderate	23 $\pm$ 0.03	21.9
7-10=severe	60 $\pm$ 0.02	57.1
Total	105 $\pm$ 0.02	100

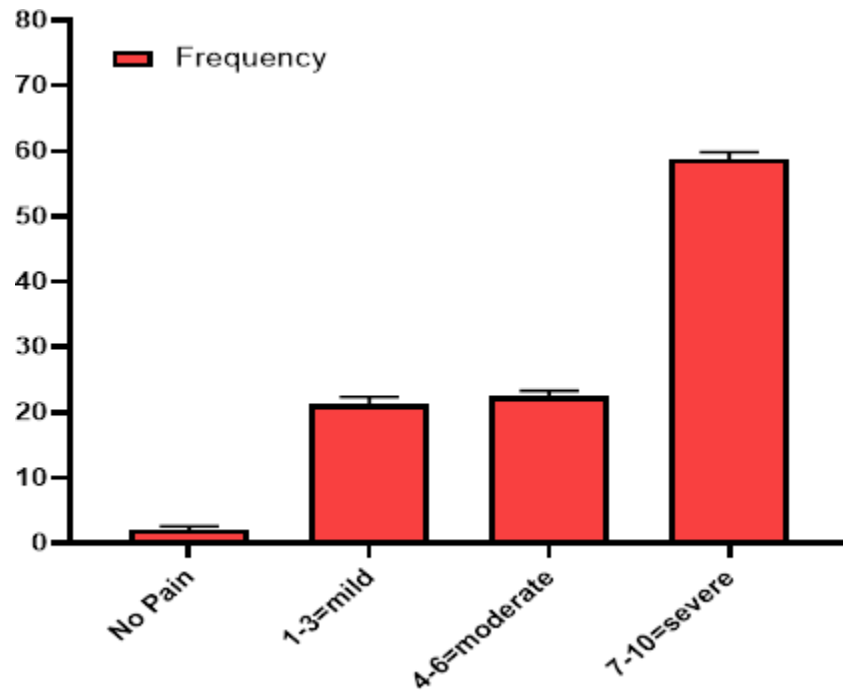


Figure 5: Pain Rating Scale (n=3, mean $\pm$ SD, $p \leq 0.05$)

Oswestry low back pain disability index is a standard tool for low back pain. The results showed that 9.5%(10) study participants have no disability, 16.2%(17) have a mild disability, 29.5%(31) have a moderate disability, 42.9%(45) have a severe disability, and 1.9%(2) lies in complete disability shown in Table 5, Figure 6.

TABLE 5: ODI Index percentage (n=3, mean $\pm$ SD, $p \leq 0.05$)

ODI index	Frequency (mean $\pm$ SD)	Percentage
0-8%= no disability	10 $\pm$ 0.07	9.5
10-28%= mild disability	17 $\pm$ 0.02	16.2
30-48%= moderate disability	31 $\pm$ 0.05	29.5
50-68%= severe disability	45 $\pm$ 0.01	42.9
70-100%= complete disability	2 $\pm$ 0.01	1.9
Total	105 $\pm$ 0.03	100

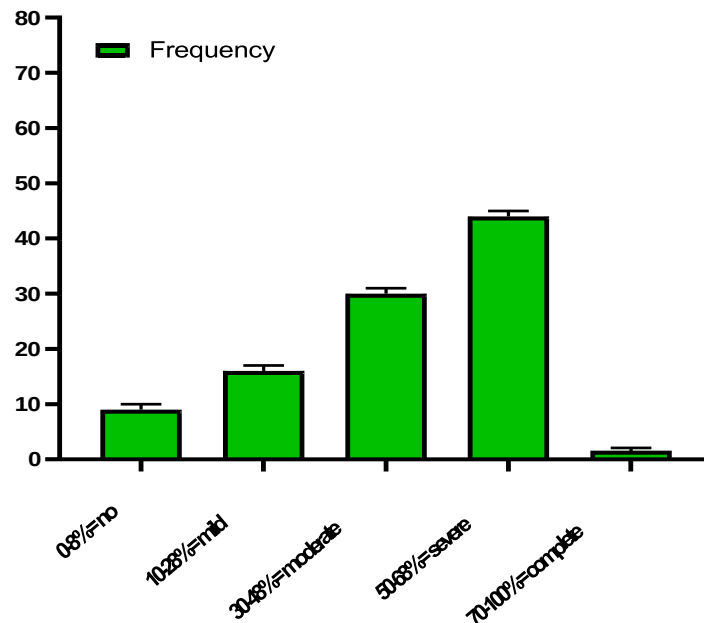


Figure 6: ODI INDEX (n=3, mean $\pm$ SD, $p \leq 0.05$)

DISCUSSION

Previous studies showed that mothers of children with cerebral palsy and parents of other disabled children had a low quality of life and low back pain. Our study showed that as the child's age increases, the mother experiences more backache because the child's weight continues to grow, so they are more dependent on the mother. This is evident from another study by Henry C [17]. Tong et al. 2003 found that the prevalence of LBP (80.3%) when the child required physical assistance during transfer was significantly higher than the prevalence (40.5%) when the child did not require physical assistance during transfer. Their study's results suggest that physical and psychological factors contribute to the onset of a mother's LBP outside of work [18].

Using the Numeric Pain Rating Scale, our study assessed the low back pain intensity. Our study showed that 57.1% of females experience severe back pain, while 21.9% experience moderate and 19% mild back pain. Our data is supported by another study, which showed that mothers were evaluated for the most painful joint pain during activity; a numerical rating scale (NRS) was used to assess pain. This scale ranges from 0 to 10 (with 0 points = no pain and 10 points = severe pain). The numerical rating scale value was 3.57 ± 2.96 in the patient group [19]. Our study used the Oswestry Low Back Pain questionnaire score to determine the physical disability. We found that OBPdq scores among mothers of children with cerebral palsy were significantly high. The mothers assessed in our study showed the most evident difficulties in performing daily life activities due to back pain as they are the primary caregivers of their CP child. Our study results showed that 42.9% lies in severe disability, 29.5% lies in moderate, 16.2% in mild disability, and 9.5% lies in no disability. This is also evident in work done by Tonga E Dürger T. They also used the Oswestry Low Back Pain Questionnaire Scale (OBPDQ) to determine physical disability, and they showed study similar results that pain intensity, duration of time and OBPdq were higher in mothers of non-ambulatory disabled children ($p < 0.05$) [20].

One study by Glinac et al. in 2017 investigated whether there are differences in quality of life between mothers of children with cerebral palsy and mothers of healthy children and whether the quality of life of mothers of children with cerebral palsy depends on their level of education, the child's mobility and the child's functional status [21]. A total of 141 mothers took part in the study. A multidimensional questionnaire, PedsQL™ 2.0 Family Impact Mode, was used to assess the impact of children's chronic health conditions on maternal functioning. The child's level of functional disability was measured using the Gross Motor Function Classification System (GMFCS Levels I-V) scale. There was a statistically significant negative correlation between a child's active status as measured by GMFCS and maternal social functioning, maternal daily activities, parental functioning, family functioning,

and overall maternal quality of life [22].

In another study by Rabia Terzi & Gülten Tan (2016), 85 mothers of children with cerebral palsy were included as a treatment group and 42 mothers of healthy children as a control group. Back pain was reported most frequently by mothers in the treatment group (44.7%) [20].

RECOMMENDATIONS

In the light of current work, we would hereby recommend conducting a large-scale epidemiological study to determine the prevalence of low back pain among mothers of children with CP across different demographics and regions. Utilize standardized assessment tools and diagnostic criteria to ensure the accuracy and consistency of data. Consider longitudinal research to track this population's development and progression of low back pain over time. Investigate factors contributing to low back pain's onset and persistence, including caregiving intensity and duration. Assess the psychosocial factors contributing to low back pain among these mothers, including stress, depression, and anxiety. Explore the impact of social support systems on their well-being and pain management. Evaluate the impact of low back pain on mothers' overall quality of life, physical functioning, and emotional well-being. and quality of life

CONCLUSION:

We concluded that there is a significantly high prevalence of pain intensity and low back pain among mothers of children with cerebral palsy. As caring for CP children is both demanding and challenging, the requirement of long-term daily care for a child with a physical disability such as CP can develop back pain syndrome in the mother. Preventing hazardous physical activities, maintaining body weight, and knowledge about accurate handling and lifting techniques can help avoid LBP among mothers of children with CP.

AUTHORS CONTRIBUTION:

Hina Javed: Supervision ,data analysis and final proofreading, Sana Gul: Data collection, Hammad Ahmad, Anam javed, Haseeb Muhammad Khan: Supervision data analysis and final proofreading, Muhammad Abdul Moiz: Writing and collection of data, Anum Tariq: Manuscript writing and analysis.

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CONFLICT OF INTEREST:

The authors declare no conflict of interest.

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