

Impact of Chronic Low Back Pain (CLBP) On Quality of Life (QOL) of Parents with Physically Handicapped Children

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ABSTRACT

INTRODUCTION: Parents of physically disabled children are susceptible to chronic low back pain (CLBP) due to sustained physical demands and psychosocial stress associated with caregiving. However, data on the prevalence of CLBP and its impact on quality of life (QOL) among parental caregivers in Malaysia remain limited. This study aimed to determine the prevalence of CLBP among parents of physically disabled children and to examine its relationship with children's functional level and parental QOL. **MATERIALS AND METHODS:** A retrospective analysis of data from a cross-sectional survey was conducted among 94 parents of physically disabled children aged 2-14 years in Bandar Puncak Alam, Selangor. Participants were primary caregivers aged 18 years and above who lived with the child and reported low back pain (LBP) lasting more than three months. Data collected included demographic characteristics, children's functional level, pain-related disability, and QOL. Descriptive and inferential analyses were performed to examine prevalence and associations. **RESULT:** CLBP was reported by 70% of parents (n=66). No significant association was found between children's functional level and the prevalence of CLBP ($\chi^2=3.47$, $p=0.48$). Pain-related disability showed significant negative correlations with QOL domains, including role limitations due to physical health ($p=0.002$), fatigue ($p=0.001$), pain ($p=0.002$), general health ($p=0.001$), and perceived health change ($p=0.004$). **CONCLUSION:** Our findings reveal a high prevalent of CLBP among parents of physically disabled children and are associated with substantial impairments in QOL.

Keywords

Handicapped, Musculoskeletal, Pain, Physiotherapy, Rehabilitation

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INTRODUCTION

Chronic low back pain (CLBP) is a major global public health concern and a leading contributor to years lived with disability across all age groups.¹⁻³ Epidemiological evidence consistently demonstrates that CLBP affects a substantial proportion of the adult population worldwide, with increasing prevalence attributed to aging populations, sedentary lifestyles, and cumulative occupational and caregiving demands. Beyond its clinical

implications, CLBP imposes considerable socioeconomic burdens through healthcare utilization, work absenteeism, reduced productivity, and long-term disability, underscoring its significance as a priority condition in public health planning.

Informal caregivers represent a high-risk subgroup within the population burdened by CLBP, particularly parents of physically disabled children who provide

long-term, unpaid care. From an epidemiological perspective, caregiving-related musculoskeletal disorders are increasingly recognized as a neglected public health issue, as caregivers are routinely exposed to repetitive biomechanical loading, manual handling tasks, and prolonged static or awkward postures. These exposures substantially elevate the risk of developing low back pain that may transition into chronicity.⁴⁻⁵ The cumulative nature of these physical stressors, compounded by psychosocial strain and limited access to preventive healthcare services, positions caregiver CLBP as both a clinical and population-level concern.

The public health implications of CLBP among parents of physically disabled children extend beyond individual morbidity. Persistent pain in caregivers is associated with reduced functional capacity, diminished workforce participation, increased healthcare-seeking behaviour, and impaired quality of life (QOL).⁷⁻⁹ Importantly, caregiver health directly influences caregiving quality and continuity, with potential downstream effects on child health outcomes and broader family well-being. Despite these implications, epidemiological data on CLBP among parental caregivers remain limited in low- and middle-income countries, including Malaysia, where community-based prevalence estimates are scarce, particularly in rapidly developing regions such as Selangor.^{6,10,11}

From a population health perspective, identifying factors associated with CLBP in caregivers is essential for informing targeted preventive strategies. The functional severity of a child's physical disability, commonly classified using the Gross Motor Function Classification System (GMFCS), may serve as an important exposure variable influencing caregiving intensity and musculoskeletal load. However, the relationship between GMFCS levels and parental CLBP has not been sufficiently examined, limiting the ability to stratify risk and allocate resources effectively within caregiver support programs.

Therefore, this study aimed to determine the prevalence of CLBP among parents of physically disabled children in Bandar Puncak Alam, Selangor, Malaysia. In addition, the study examined the association between children's GMFCS levels and the occurrence of CLBP, as well as the relationship between CLBP and QOL among parents. By providing localized epidemiological evidence, the findings of this study may inform public health policies, caregiver health surveillance, and the development of context-specific interventions aimed at reducing the burden of CLBP and improving quality of life among parental caregivers.

MATERIALS AND METHODS

Study Design

The current study employed a retrospective study design, which aimed to analyse data collected from a cross-sectional survey.

Study Setting and Participant Recruitment

The study was conducted at Universiti Teknologi MARA Selangor, Bandar Puncak Alam, Selangor. The retrospective data were drawn from a cross-sectional survey conducted among parents with physically disabled children within Bandar Puncak Alam from November 2022 until March 2023.

Only data that met the following inclusion criteria were included: i) experienced CLBP lasting more than 3 months, ii) age above 18 years old (≥ 18 years old), iii) having a physically handicapped child aged between 2 and 14 years old, iv) being the main caregiver responsible for the daily provision of care to the child, and v) living with the child in the same place.

Data were excluded if the parent had the following criteria: i) need to care for more than one physically disabled child, ii) have additional caregiving responsibilities apart from their usual parenting care, iii) caregivers of children with other conditions like Down syndrome, Leukodystrophy and Autism are excluded, and iv) caregivers who has chronic illnesses

like diabetes mellitus, chronic obstructive pulmonary disease, hypertension, carcinoma, or a history of chronic psychological disorder or depression.

Size Calculations

One of the aims of the current study is to explore the prevalence of CLBP incidence among parents with physically disabled children. Hence, the sample size was calculated based on parents attending physiotherapy services and Community Rehabilitation Centre at Puncak Alam. The known population of parents with physically disabled children is 148. The following steps were used to calculate the sample size.¹⁵⁻¹⁶

The infinite sample size calculation was identified using the following formula

$$n = \frac{Z^2 \cdot p \cdot (1 - p)}{E^2}$$

Where, **n** is the required sample size.

Z is the Z-value corresponding to the desired confidence level (e.g., 1.96 for 95% confidence).

p is the estimated prevalence of the condition.

E is the margin of error.

$$n = \frac{(1.96)^2 \cdot 0.20 \cdot (1 - 0.20)}{(0.05)^2}$$

$$n = 246$$

Since the known population is 150, the Finite Population Correction (FPC) calculation was applied based on the infinite calculation to adjust for the smaller population size.

$$n_{adj} = \frac{n}{1 + \frac{n-1}{N}}$$

Where, **n** is the initial sample size from the infinite population formula.

n_{adj} is the adjusted sample size for the finite population.

N is the total population size (150).

$$n_{adj} = \frac{246}{1 + \frac{246-1}{148}}$$

$$n_{adj} = 92.5$$

$$n_{adj} \approx 93$$

Based on the calculation, with an estimated prevalence of 20%, a 95% confidence level, and a 5% margin of error, the required sample size after applying the finite population correction was a total of 93 data was needed for the study.

Data Collection

Data were retrospectively collected from previous surveys conducted in November 2022 until March 2023. The parameters of interest are demographic details (age, gender, marital status, the number of physically disabled children, history of low back pain, child's functional level), the Oswestry Low Back Pain Disability Questionnaire total score, and the 36-Item Short Form Survey (SF-36) total score. Data screening was performed by a research assistant who was not involved with the previous survey. All data were anonymously screened to maintain participants' confidentiality. Once data were available, the research team entered and organized it.

Statistical Analysis

Data were analysed using IBM Statistical Package for the Social Sciences (SPSS) Statistics 29.0.2.0. The descriptive statistics (frequency, percentage, minimum, maximum, mean $\pm$ SD) were used to report the prevalence of CLBP, participant's demographic data, Oswestry total score, and SF-36 total score. The Shapiro-Wilk test yielded that the p-value is greater than 0.05 ($p=0.08$). Hence, the Oswestry and SF-36 data is considered not significantly to deviate from normality and can be assumed to have a normal distribution. The Chi-Square test for independence was conducted to explore the association between GMFCS level with CLBP incidence. Next, the Spearman Correlation Coefficient was used to identify the relationship between Oswestry and SF-36 score. Significance values were set a p is less than 0.05

($p < 0.05$) to indicate that CLBP (Oswestry score) has significantly affected the parents' QOL (SF-36 scores).

RESULTS

The prevalence of CLBP among parents of physically disabled children in Bandar Puncak Alam, Selangor

Overall, 94 data (21 male / 73 female) of parents with physically handicapped children were included. Most of the parents were aged between 26 to 44 years old ($n=62$), with an average age is 41.6 ± 7.1 years old. Around 70% of the participants declared that they have CLBP. The majority of children have a high level of impairment. Around 65% of children have GMFC level IV ($n=21$; 22.3%) and level V ($n=44$; 46.8%). Of 94 children, 67 (71.3%) of them are underweight, 13 (13.8%) have normal BMI, 8 (8.5%) are pre-obese, and 6 (6.4%) children have BMI Obesity Class I (Table I).

Association Between GMFCS Level and CLBP Incidence

The Chi-Square test for independence revealed that there was no significant association between the child's GMFC level and CLBP prevalence ($\chi^2(1)=3.468$, $p=0.483$).

The Impact of CLBP on QOL of Parents with Physically Disabled Children

The Spearman Correlation analysis reveals that CLBP has significantly affected 5 QOL domains of the parents ($p < 0.05$) (Table II), which are role limitations due to physical health, fatigue, pain, general health, and health change.

Table I: Parents' and children demographic characteristic

Characteristics	(n) %	Min	Max	Mean $\pm$ SD	Chi-Square (p)
Parent's detail					
Age (years old)	94	25	56	41.6 ± 7.1	
18 -25	1 (1.1)				
26-44	62 (66)				
45-59	31 (33)				
Gender					
Male	21 (22.3)				
Female	73 (77.7)				
Ethnicity					
Malay	87 (92.6)				
Indian	4 (4.3)				
Chinese	3 (3.2)				

Cont.

Incidence of CLBP					
Yes	70 (74.5)				
No	24 (25.5)				
Duration of CLBP (months)		0	18	4.6± 4.0	
Child's detail					
Age		2	22	9.1± 4.4	
GMFCS level					0.483
I	4 (4.3)				
II	10 (10.6)				
III	15 (16.0)				
IV	21 (22.3)				
V	44 (46.8)				
Gender					
Boy	53 (56.4)				
Girl	41 (43.6)				
Height (meter)		0.60	1.76	1.2± 0.6	
Weight (kilogram)		6.80	70	26 ±14	
Body Mass Index (BMI) (kg/m2)		4.70	34.60	17.3 ±6.0	

Table II: Impact of CLBP on Quality of Life

Questionnaire	Min	Max	Mean $\pm$ SD	p
Oswestry	0	100	9.7 ± 7.9	
SF-36				
Physical function	10	100	74.9 ± 21.6	0.58
Role limitation due to physical health	0	100	81.8 ± 23.7	0.002*
Role limitation due to emotional	0	100	81.3 ± 23.8	0.171
Fatigue	0	100	58.1 ± 22.5	0.001*
Emotional wellbeing	28	100	71.9 ± 16.4	0.25
Social function	25	100	78.8 ± 15.5	0.557
Pain	12.5	100	71.2 ± 20.2	0.002*
General Health	20	100	64.7 ± 23	0.001*
Health Change	25	100	61.0 ± 25.7	0.004*

($p < 0.05$)*

DISCUSSION

The present study found that 70% of parents caring for physically disabled children experienced chronic low back pain (CLBP), indicating a substantial burden of musculoskeletal morbidity within this caregiving population. This prevalence is comparable to that reported in previous studies involving caregivers of children with disabilities, which consistently demonstrate high rates of CLBP attributable to

sustained physical demands and caregiving-related biomechanical stressors.^{17,18} Activities such as repetitive lifting, manual transfers, prolonged forward-flexed postures, and continuous physical support have been identified as key contributors to lumbar spine overload and the development of chronic pain.^{19,20} From a public health perspective, these findings underscore caregiving as an occupational-like exposure that warrants greater recognition in musculoskeletal health surveillance.

Previous literature suggests that the severity of a child's motor impairment, as classified by the Gross Motor Function Classification System (GMFCS), is associated with increased caregiver physical burden and higher prevalence of CLBP, particularly among parents of children classified at GMFCS levels IV and V.^{19,21} However, contrary to these findings, the present study did not demonstrate a significant association between GMFCS level and CLBP prevalence. This discrepancy may be partly explained by contextual factors within the studied population, such as the relatively low body mass index (BMI) of the children, even among those with severe functional limitations.¹³ Lower child body weight may reduce the absolute mechanical load experienced by parents during caregiving tasks, potentially attenuating the relationship between GMFCS level and CLBP.²⁸ Additionally, variability in caregiving techniques, use of assistive devices, and informal coping strategies may further moderate this relationship.^{6,19} Nonetheless, the high overall prevalence of CLBP observed highlights the need for targeted preventive interventions regardless of GMFCS level, including ergonomic training and caregiver-focused musculoskeletal health programs.

The present study also demonstrated significant correlations between CLBP and multiple domains of quality of life (QOL), particularly role limitations due to physical health, fatigue, pain, general health perception, and perceived health changes. These findings are consistent with existing evidence showing that chronic musculoskeletal pain substantially compromises caregivers' functional capacity and well-being.^{17,22} Role limitations related to physical health emerged as a

prominent concern, reflecting caregivers' reduced ability to perform daily activities, occupational responsibilities, and caregiving tasks. Such limitations may lead to psychological distress, including frustration, guilt, and perceived inadequacy, which can further exacerbate pain and emotional burden.^{23,24}

Fatigue was also significantly associated with CLBP, highlighting the multidimensional impact of chronic pain on caregiver health. CLBP is known to disrupt sleep quality and recovery, contributing to persistent fatigue and reduced energy levels. For parents of physically disabled children who already experience heightened physical and emotional demands this fatigue may significantly impair caregiving capacity and overall functioning. These findings align with previous studies reporting elevated fatigue levels among caregivers with chronic musculoskeletal pain, reinforcing the interrelationship between pain, sleep disturbance, and diminished QOL.¹⁷⁻¹⁸

Pain severity demonstrated a significant association across all assessed QOL domains, underscoring pain as a central determinant of caregiver well-being. Chronic pain not only limits physical activity but also restricts social participation and contributes to emotional distress, including symptoms of anxiety and depression.²⁵⁻²⁷ Psychological distress, in turn, may amplify pain perception, creating a bidirectional cycle that further deteriorates QOL.^{17,25} These findings emphasize the importance of comprehensive pain management strategies that address both physical and psychosocial dimensions of CLBP in caregivers.

Furthermore, caregivers with CLBP reported poorer perceptions of general health and negative health changes over time, reflecting a broader decline in self-rated health status. This observation is consistent with prior research indicating that prolonged caregiving responsibilities combined with chronic pain contribute to cumulative health deterioration among caregivers.^{27,28} Negative health perceptions may reduce motivation to seek healthcare or engage in preventive behaviours,

thereby perpetuating poor health outcomes and increasing long-term healthcare utilization.^{10,24,27}

Overall, the findings of this study align with the growing body of literature demonstrating the detrimental impact of CLBP on the quality of life of caregivers of children with disabilities.²⁹ While some studies have reported inconsistent associations between pain severity and caregiving intensity, such variability may reflect differences in caregiving environments, access to support systems, individual coping mechanisms, and cultural expectations surrounding caregiving roles.²⁷⁻³⁰ These factors highlight the need for a holistic, context-sensitive approach to caregiver health that integrates ergonomic, physical, and psychosocial interventions.

From a public health perspective, the high prevalence of CLBP and its significant association with reduced QOL among parents of physically disabled children indicate an urgent need for caregiver-focused musculoskeletal health policies. Early screening, ergonomic education, access to rehabilitation services, and structured caregiver support programs should be incorporated into disability and family health services to mitigate long-term health consequences and sustain caregiving capacity.⁶⁻⁷

CONCLUSION

This study provides evidence that chronic low back pain (CLBP) is highly prevalent among parents of physically disabled children and is significantly associated with poorer quality of life, particularly in relation to role limitations, fatigue, pain, and perceived general health. These findings reinforce the need to recognize parental caregiving as a significant risk context for chronic musculoskeletal conditions. Addressing CLBP in this population requires integrated, caregiver-centred approaches that combine musculoskeletal health management with psychosocial support. Future research should focus on longitudinal and intervention-based studies to inform evidence-driven strategies that promote caregiver health, functional capacity, and caregiving sustainability.

INSTITUTIONAL REVIEW BOARD (ETHIC COMMITTEE)

Ethical approval for the cross-sectional survey was gained from the university Research Ethics Committee (FERC/FSK/MR/2022/0283).

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DECLARATION OF GENERATIVE AI AND AI-ASSISTED TECHNOLOGIES IN THE WRITING PROCESS

During the preparation of this work, the author(s) used ChatGPT to draft the manuscript text. The author(s) subsequently reviewed, revised, and approved all content, and accept full responsibility for the final manuscript

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