

ORIGINAL ARTICLE

Low Back Pain and Risk Factors among Caregivers of Children with Disabilities in Zambia

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ABSTRACT

Background: In Zambian culture, caregiving is a shared family responsibility, often led by women as primary caregivers, with support from extended family. This practice helps reduce hospital bed demand but places a significant burden on caregivers. Evidence on how this burden affects caregivers' health, particularly its link to musculoskeletal conditions like low back pain, remains limited.

Objective: To determine the prevalence of LBP and spinal degenerative conditions among primary caregivers of children with disabilities and identify associated risk factors.

Methodology: A quantitative cross-sectional study was conducted among caregivers of children with disabilities attending the outpatient physiotherapy clinic at the University Teaching Hospitals. Data was gathered using a structured two-part questionnaire and analysed using SPSS. Associations between LBP and risk factors were evaluated with ANOVA at a 5% significance level.

Results: Low back pain (LBP) was highly prevalent among caregivers, with 90% reporting LBP in the

past year, 65% at some point in their lives, and 45% in the last 7 days. Degenerative spinal conditions were less common, with 5% reporting lumbar spondylitis and 2.5% lumbar spondylosis. Strenuous caregiving tasks ($p < 0.001$), inadequate orthotic support ($p = 0.016$), and emotional stress ($p = 0.003$) were significant contributors to LBP.

Clinical Implications: Routine screening for LBP and early interventions are vital to prevent chronic pain and disability among caregivers. Healthcare providers should prioritize ergonomic support, training in proper caregiving techniques, access to orthotic devices, and mental health support to reduce physical and emotional strain.

Conclusion: Caregiving places significant physical and emotional demands, leading to a high prevalence of LBP and long-term musculoskeletal risks. Early screening, ergonomic support, and caregiver education are essential to improving caregiver well-being and reducing health risks.

INTRODUCTION

In Zambia, low back pain (LBP) is a common health condition among caregivers, who often face poorer health outcomes compared to non-caregivers.

Keywords: Low back pain, caregivers, spinal degeneration, musculoskeletal strain, caregiving burden, healthcare support.

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Studies report that adult informal caregivers in Zambia are more likely to be in fair to poor health and exhibit higher levels of depressive symptoms than non-caregivers¹. Additionally, caregivers frequently report difficulty sleeping, with 46% of African caregivers experiencing this issue, and 31% describing their health as fair or poor². Caregivers of children with cognitive developmental disabilities experience elevated psychological symptoms and heightened parenting stress, which intensifies with the severity of the child's condition³. Activity limitations due to chronic conditions are also reported by parents of non-institutionalised children with disabilities in Africa⁴. In Southern Africa, ageing parents, often the primary caregivers for disabled children, face significant functional limitations and health challenges, highlighting the critical importance of caregiver well-being⁵.

The quality of care provided to disabled children is closely linked to the health of their primary caregivers, predominantly mothers, whose physical and emotional well-being directly affects caregiving capacity⁶. In Zambia, limited access to healthcare and ergonomic support exacerbates the physical and emotional strain on caregivers. LBP is a major concern, with lifetime prevalence estimates ranging from 70% to 94%, and nerve entrapment contributing to up to 28% of cases, leading to clinical interventions or time off work⁷.

Lumbar spondylosis, a degenerative condition involving intervertebral disc degeneration, is characterised by cyst formation, subchondral sclerosis, osteophyte growth, and joint space narrowing⁸. Spondylitis, an inflammatory condition of the vertebrae, often presents with localised pain that worsens at night and significantly impacts quality of life⁹. Globally, LBP has an annual prevalence rate of up to 45%, with an increasing incidence over the past 13 years¹⁰. While LBP is more common in women and peaks among individuals aged 60–65 years, its association with caregiving, particularly in low-resource settings, remains underexplored.

In Zambia, caregivers, particularly those supporting children with disabilities, often undertake physically demanding tasks without adequate ergonomic support or knowledge of proper techniques to protect their musculoskeletal health. These challenges are compounded by limited healthcare resources and a lack of preventative strategies. As informal caregiving remains the primary mode of care provision in Africa, addressing LBP among caregivers is critical to improving their health and the quality of care for children with disabilities.

Research shows that caregiving adversely impacts the physical and psychological well-being of caregivers¹¹. LBP, predominantly mechanical in nature, can progress to chronic conditions associated with disc degeneration or spondylosis¹². This study aimed to assess the prevalence of LBP among primary caregivers of children with disabilities, examine the link between caregiving activities and LBP, and identify risk factors for degenerative spinal conditions. Findings from this study are expected to inform targeted interventions to improve caregiver health, enhance care quality, and reduce stress and depressive symptoms among caregivers. These measures will ultimately benefit both caregivers and children, strengthening families and communities.

METHODOLOGY

Study Design and Population: This study employed a quantitative, cross-sectional design, chosen for its cost-effectiveness and suitability for capturing population-based data¹³. The design facilitated a focused examination of caregivers' experiences with low back pain (LBP) and its associated risk factors. While appropriate for identifying prevalence and correlations, this design has inherent limitations, including the inability to establish causation between caregiving activities and LBP. These limitations were acknowledged in interpreting the findings. The study population consisted of primary caregivers, including biological parents and others

providing care to children with disabilities for at least one year. Participants were recruited from the outpatient physiotherapy clinic at the University Teaching Hospitals, Zambia, between January and August 2024. On average, 13 children attended the clinic daily, with 12 accompanied by caregivers. The inclusion criteria encompassed caregivers from diverse age groups, genders, and socioeconomic backgrounds to ensure varied representation.

Sample Size: A total of 40 participants were recruited for this study. This was fewer than the anticipated 65 due to declining clinic attendance and participant refusals. While the sample size provided valuable insights, its small size limits the generalisability of the findings to broader populations. Future studies with larger, more representative samples are needed to strengthen external validity.

Data Collection: Data collection was facilitated using a structured, researcher-administered questionnaire. The questionnaire comprised two main sections: Section A included demographic information and employed the Standardised Nordic Questionnaire, a validated tool widely used for assessing musculoskeletal complaints^{14, 15}. Section B focused on caregiver burden using a modified four-part caregiver burden assessment questionnaire¹⁶. Modifications were made to suit the study context, tailoring questions to reflect the unique caregiving challenges in Zambia, such as physically demanding tasks and limited access to ergonomic support. While these adaptations enhanced relevance, further detailed documentation is necessary to ensure transparency and facilitate replication in similar settings.

Bias Minimisation: Efforts were made to minimise potential biases. Participants were recruited through departmental registers to reduce selection bias and capture a wide range of experiences. Recall bias was addressed by structuring questions to focus on recent caregiving experiences, including LBP occurrences

within the past 7 days, year, or lifetime. Despite these measures, potential biases may not have been fully eliminated, and this limitation was explicitly acknowledged in interpreting the findings.

Data Analysis: Data were analysed using SPSS version 30.0. Descriptive statistics were employed to calculate means and standard deviations for key variables. Associations between LBP and potential risk factors—such as caregiving duration, physical workload, and ergonomic practices—were analysed using ANOVA. Statistical significance was set at the 5% level, ensuring robust analytical rigour.

Ethical Considerations: Ethical approval was obtained from the University of Zambia School of Health Sciences Undergraduate Research Ethics Committee (UNZASHUREC), Protocol ID 20231270285, and the University Teaching Hospitals management. Informed consent was obtained from all participants before data collection. Data confidentiality was ensured by securely storing all data in password-protected and biometric-secure databases, with cloud backups protected by two-factor authentication.

RESULTS

Demographic Details of the Participants

Table 1 provides a summary of the demographic details of the study participants. The majority (85%) were female, with the most common age group being 31 to 34 years (40%). A notable 55% of participants were single, and the vast majority (87.5%) were unemployed. Regarding education, 42.5% had completed secondary school. The children of the caregivers were predominantly under the age of 5, representing 45% of the total sample.

Table 1: Demographic details of the participants

Demographic Details	Frequency (N= 40)	Percentage (%)
Gender		
Male	6	15
Female	34	85
Age		
17 years and below	1	2.5
18 years to 22 years	6	15
23 years to 26 years	7	17.5
27 years to 30 years	4	10
31 years to 34 years	16	40
35 and above	6	15
Marital status		
Married	18	45
Single	22	55
Economic status		
Employed	5	12.5
Unemployed	35	87.5
Educational Background		
Primary School	14	35
Secondary School	17	42.5
University	9	22.5
Age of Children		
5 years and below	18	45
6 years to 10 years	15	37.5
11 years to 15 years	6	15
16 years to 17 years	1	2.5

Prevalence of Low Back Pain and Degenerative Conditions

The prevalence of low back pain (LBP) was high among participants. As shown in Table 2, 90% of participants reported experiencing LBP in the past year, while 65% had experienced it at some point in their lives. However, degenerative spinal conditions were less common, with only 5% reporting lumbar spondylitis and 2.5% reporting lumbar spondylosis. Additionally, 45% of participants reported experiencing LBP in the last 7 days.

Table 2: Prevalence of low back pain and degenerative conditions

Low Back Pain	Frequency (N=40)	Percentage (%)
Lifetime Low Back Pain experience		
Yes	26	65
No	14	35
Low Back Pain in the last 1 year		
Yes	36	90
No	4	10
Low Back Pain in the last 7 days		
Yes	18	45
No	22	55
Degenerative conditions		
Lumbar Spondylitis		
Yes	2	5
No	38	95
Lumbar Spondylosis		
Yes	1	2.5
No	39	97.5

Risk Factors Influencing Low Back Pain and Degenerative Conditions

Table 3 presents significant risk factors for LBP and degenerative conditions. The most strenuous caregiving activity was strongly associated with LBP ($p < 0.001$), highlighting that physically demanding caregiving tasks contribute to back pain. Additionally, the availability of orthotic devices ($p = 0.016$) and emotional stress ($p = 0.003$) were significant factors, indicating that inadequate support for the spine and psychological burden increase the risk of LBP among caregivers.

Table 3: Risk factors influencing low back pain and degenerative conditions

Risk Factors	F value	Significance
Gender	0.334	0.567
Hours of care	1.431	0.239
Marital Status	0.607	0.441
Economic Status	3.938	0.054
Educational Background	0.271	0.605
Physical demand of caregiving	0.109	0.744
Heavy lifting in relation to caregiving	0.795	0.378
Age range of the child	<0.001	1.000
Most strenuous activity of caregiving	21.380	< 0.001*
Availability for orthotic devices	6.333	0.016*
Emotional Stress	10.282	0.003*

*Significant at level 0.05

Severity of Low Back Pain and Degenerative Conditions

As detailed in Table 4, most participants (47.5%) reported severe LBP, as measured on the visual analogue scale (VAS). Additionally, 45% of participants indicated that the pain lasted less than five days. Despite the severity of pain, only 17.5% sought medical help, suggesting a potential underutilisation of healthcare services. Stress levels were also high, with 40% reporting severe stress related to their caregiving responsibilities.

Table 4: Severity of low back pain and degenerative conditions

Severity	Frequency (N= 40)	Percentage (%)
Duration of pain		
Less than 5 days	18	45
6 to 10 days	17	42.5
More than 11 days	5	12.5
Visual analogue scale for pain		
1 to 3 Mild	7	17.5
4 to 7 Moderate	14	35
8 to 10 Severe	19	47.5
Level of stress		
1 to 3 Mild	9	22.5
4 to 7 Moderate	15	37.5
8 to 10 Severe	16	40
Sought medical help		
Yes	7	17.5
No	33	82.5

Participants' Coping Strategies for Back Pain and Degenerative Conditions

Table 5 highlights the coping strategies employed by participants. The most used strategy was pharmacological treatment, with 55% of participants relying on over-the-counter medication. Rest (32.5%) and herbal concoctions (10%) were also commonly used. Remarkably, only 2.5% of participants used exercise as a coping strategy, indicating a significant underuse of potentially effective non-pharmacological interventions for LBP management.

Table 5: Participants coping Strategies for back pain and degenerative conditions

Coping strategies	Frequency (N=40)	Percentage (%)
Pharmacological		
Over the counter medication	22	55
Non -pharmacological		
Rest	13	32.5
Exercise	1	2.5
Herbal concoctions	4	10

DISCUSSION

Caregivers of children with disabilities face significant physical and emotional challenges, particularly in resource-limited settings like Zambia. This discussion highlights the substantial burdens these caregivers endure, with caregiving demands affecting various aspects of their lives, including family dynamics, financial stability, and emotional well-being. The unique challenges faced by caregivers in Zambia, such as limited access to healthcare, ergonomic support, and financial resources, exacerbate these burdens. This study provides valuable insights into the health issues faced by caregivers in Zambia, focusing on the prevalence of low back pain (LBP) and its connection to caregiving activities. The findings are consistent with global trends but also reveal specific contextual factors that influence caregiving in Zambia. These include the absence of structured caregiver support programmes and the cultural expectation for women to assume caregiving roles.

Consistent with global trends, most caregivers in this study were women, reflecting the disproportionate burden they bear in providing informal care¹⁷. The high prevalence of LBP among caregivers is a significant finding, indicating that caregiving duties, particularly those involving physically demanding tasks, contribute significantly to musculoskeletal strain. The diverse range of disabilities among the children further complicates caregiving, as each condition requires unique physical and emotional support¹⁸. The discrepancy between the high prevalence of LBP (90%) and the low prevalence of degenerative conditions (5%) suggests that most LBP cases are mechanical in nature and reversible with timely intervention. This finding underlines the importance of early identification and management of LBP to prevent progression to chronic conditions. While LBP was common, it was notable that many caregivers did not seek medical attention, possibly due to prioritising the child's needs over their own health, financial constraints, or limited access to healthcare. This reluctance aligns with other research, which suggests that the heavy

responsibilities of caregiving often lead to both physical and psychological strain, exacerbating the condition^{19, 20}. Improving caregivers' access to affordable healthcare and creating awareness about the importance of self-care are critical to addressing this gap.

The relationship between stress and the severity of LBP is a significant concern. The study found that high levels of emotional stress are closely linked to the intensity of physical pain, supporting existing literature that highlights the role of psychological factors such as stress, anxiety, and depression in the onset and exacerbation of LBP²². This highlights the need for integrated health interventions that address both physical and psychological aspects of caregiver well-being. The study explored the risk factors for LBP among caregivers, revealing that the most physically demanding caregiving tasks, such as lifting or transferring the child, significantly increase the risk of developing LBP. Emotional stress was also identified as a key risk factor, highlighting the negative impact of psychological strain on physical health. The availability of supportive equipment, including orthotic devices, was found to reduce some of the physical strain associated with these tasks, in line with previous research that emphasises the importance of providing caregivers with appropriate support to reduce the risk of musculoskeletal injuries such as LBP²³. Healthcare systems in Zambia must prioritise the provision of ergonomic support tools, such as orthotic devices, and train caregivers on their proper use.

When examining coping strategies for managing LBP, the study found that caregivers primarily relied on pharmacological treatments and rest. However, exercise, a known effective strategy for managing LBP, was rarely utilised. This may be due to time constraints, lack of awareness about its benefits, or barriers such as physical limitations. Notably, the study also revealed a significant association between the use of orthotic devices and more effective coping strategies, emphasising the importance of access to appropriate resources in alleviating both physical and emotional strain²⁴. Integrating physiotherapy-

based education and exercise programmes into caregiving support services could enhance LBP management.

CONCLUSION

The study highlights the significant physical and emotional challenges faced by caregivers, particularly in relation to LBP. The findings emphasise the importance of addressing both the physical and psychological health needs of caregivers, with a focus on providing practical resources, support, and education. Although degenerative spinal conditions were not prevalent, the high rates of LBP emphasise the need for targeted interventions such as caregiver training, ergonomic support, and stress management programmes. While the study provides valuable insights, its findings are limited by the small sample size and cross-sectional design. Future research with larger, longitudinal studies is necessary to explore causation, identify long-term impacts, and develop sustainable policies for supporting caregivers.

Study Limitations

With only 40 respondents, the findings may not be generalised to a broader caregiver population, because the outcomes are based on individual responses, which limits the study's external validity. The reliance on a single study site due to budget constraints further limits representativeness, and expanding study locations in future research is recommended. Although quantitative cross-sectional studies are useful for finding correlations and comprehending prevalence, they are less appropriate for studies that require more in-depth understanding of cause-and-effect relationships or changes over time due to their limitations, particularly with regard to causality, temporal changes, and confounding variables. The small sample size also precluded the use of advanced statistical analyses, such as factor analysis. Future studies should aim for larger sample sizes to allow for more robust analytical methods .

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Competing interest

The authors affirm that neither financial interests nor personal relationships influenced the development of this article.

Author's contribution

All participants contributed significantly to the successful completion of this project. The initial manuscript was drafted by F.A.M.O. Koitsiwe, while the conceptualisation and planning of the research were led by L.A. Nkhata. The final version of the manuscript underwent thorough review and received approval from all contributors.

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