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Psychosocial and Illness-Related Predictors of Caregiver Burden in Ibadan, Nigeria

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Abstract

Caregiver burden among parents of children with neurological and neurodevelopmental conditions remains an underexplored public health concern in low-resource settings. Perceived stigma and social support may influence caregiver burden, but evidence from Nigeria remains limited. This study examined psychosocial and illness-related predictors of caregiver burden among parents of children with neurological and neurodevelopmental conditions in Ibadan, Nigeria. A cross-sectional survey was conducted among 264 parents recruited from clinical and rehabilitative settings in Ibadan. Data were collected using validated measures of caregiver burden, perceived stigma, and social support. Pearson correlation, hierarchical multiple regression, and one-way analysis of variance (ANOVA) were used for data analysis. Caregiver burden was positively associated with total perceived stigma, enacted stigma, internalised stigma, age, and caregiving duration, while social support was negatively associated with burden at the bivariate level. In the hierarchical regression, age, enacted stigma, and internalised stigma significantly predicted caregiver burden, whereas social support and quality of sleep did not significantly improve the final model. Caregiver burden also differed significantly across illness categories, with higher burden observed among caregivers of children with neuromuscular disorders, stroke/CVO, and cerebral palsy. Perceived stigma, particularly enacted and internalised stigma, was an important correlate of caregiver burden in this sample. The findings highlight the need for stigma-reduction strategies, caregiver-focused psychosocial support, and condition-sensitive approaches to care for families managing childhood neurological and neurodevelopmental conditions in Nigeria.

Keywords: Caregiver burden, neurological disorders, perceived stigma and social support

Introduction

Globally, neurological and neurodevelopmental disorders constitute one of the leading causes of long-term childhood disability, accounting for a substantial proportion of years lived with disability (YLDs) among individuals under 18 years of age. The Global Burden of Disease Study estimates that neurological disorders contribute to approximately 10% of total global years lived with disability (YLDs), with epilepsy alone affecting over 50 million people worldwide, nearly 80% of whom reside in low- and middle-income countries^[1]. Out of the Neurodevelopmental conditions, autism spectrum disorder (ASD) and attention-deficit/hyperactivity disorder (ADHD) have shown rising prevalence rates globally, with autism spectrum disorder currently affecting approximately 1 in 100 children worldwide^[2]. In Sub-Saharan Africa, epidemiological data remain underreported, yet emerging evidence suggests significant unmet needs, delayed diagnoses, and limited specialist services^[3, 4]. Evidence from a Nigerian tertiary paediatric neurology clinic also demonstrates the substantial contribution of neurological disorders to childhood morbidity, with seizure disorders and cerebral palsy among the most frequently reported conditions^[5]. In Nigeria specifically, epilepsy prevalence among children is estimated at 8–13 per 1,000, with treatment gaps exceeding 60% in some regions^[6]. Advances in medical care and decentralised service delivery models have shifted the long-term management of these conditions from hospital-centred systems to community and household contexts^[7]. Within family-centred care paradigms, parents assume sustained responsibility for medication management, behavioural regulation, therapy attendance, crisis response, and service navigation^[8]. While this model enhances continuity of care, it simultaneously transfers clinical labour into domestic spaces, effectively medicalising everyday family life. In resource-constrained settings such as Nigeria; where rehabilitation services are sparse, specialist-to-population ratios are critically low, and healthcare financing is predominantly out-of-pocket leading to the

cumulative burden of care disproportionately resting on households ^[3,10]. Consequently, caregiving becomes not merely a supportive role but a structurally imposed health system responsibility.

Caregiver burden refers to the perceived adverse impact of caregiving on emotional, social, financial, and physical wellbeing ^[11]. Family caregivers in other chronic and psychiatric conditions similarly demonstrate substantial caregiver burden and associated psychosocial demands ^[12]. However, burden cannot be reduced to objective caregiving intensity alone, as caregiver burden is influenced by multiple individuals, caregiving, and contextual factors ^[13, 14]. Meta-analytic evidence indicates that between 30% and 50% of caregivers of children with chronic neurological conditions report clinically significant psychological distress, including depressive symptoms and chronic fatigue ^[15,16].

In Nigeria, smaller-scale studies suggest similarly elevated distress levels, compounded by employment disruption, financial strain, and limited respite care ^[17,18]. Importantly, caregiving trajectories are dynamic; fluctuating symptom severity, developmental transitions, and social reactions to disability shape stress exposure over time ^[19]. In contexts undergoing rapid urbanisation and nuclearisation of family structures, traditional communal buffering systems may be weakening ^[20], thereby intensifying caregiver vulnerability. In this study, two psychosocial determinants warrant particular analytical attention in this context: perceived stigma and social support. Both extend beyond individual psychology and are embedded within social structures that shape inclusion, identity, and access to resources.

Perceived stigma is especially salient in neurological and neurodevelopmental conditions because symptoms and functional impairments may be visible and accompanied by persistent public misconceptions ^[20, 21]. Stigma theory distinguishes between enacted stigma (direct discrimination) and exclusion and internalised stigma, wherein individuals absorb societal stereotypes into self-concept ^[22, 23]. In several Nigerian communities, epilepsy and cerebral palsy are sometimes attributed to supernatural causation or moral failing, reinforcing blame-oriented narratives ^[24, 25]. Empirical studies among Nigerian parents of children with ASD and intellectual disabilities report high levels of perceived public rejection and social withdrawal, with stigma significantly predicting parental anxiety and depressive symptoms ^[16,17]. Critically, internalised stigma may exert a more insidious effect than enacted stigma. While enacted stigma operates through observable exclusion, internalised stigma restructures self-perception, undermines parental efficacy, and promotes concealment behaviours that restrict help-seeking ^[26]. Longitudinal evidence from neurological populations suggests that internalised stigma predicts poorer psychological adjustment independent of disease severity ^[27, 28]. Thus, stigma functions not merely as a contextual stressor but as a psychosocial mechanism that amplifies caregiver burden through emotional erosion and social disengagement. Conversely, social support represents a protective resource with robust empirical backing. Emotional, instrumental, informational, and financial support can mitigate stress exposure and enhance coping capacity ^[29]. Studies demonstrate that caregivers reporting high perceived support exhibit significantly lower depressive symptomatology and burnout, even under comparable caregiving intensity ^[30,31]. However, the protective effect of support is contingent on

availability and accessibility. Urban migration, economic precarity, and shifting kinship patterns in Nigeria may reduce the density and reliability of extended support networks ^[19]. Therefore, while social support is theoretically buffering, its protective capacity may be structurally constrained in contemporary Nigerian settings.

The present study draws explicitly on Pearlin's Stress Process Theory ^[32], but critically interrogates its assumptions and applicability in low-resource caregiving ecologies. Stress Process Theory conceptualises caregiver burden as emerging from the interaction of primary stressors (intensive care demands), secondary stressors (role strains such as stigma), and mediating resources (social support) ^[31, 32]. While this framework has strong explanatory utility in Western contexts, its empirical application in Sub-Saharan African settings remains limited and uncritical. In much existing research, stigma is treated as a peripheral psychosocial correlate rather than a core structural stressor that both shapes and reflects societal power dynamics, cultural meanings of disability, and access to healthcare resource ^[33].

Moreover, although Stress Process Theory posits that social support buffers stress effects, there is scant evidence testing this mediation in paediatric neurological caregiving outside high-income settings ^[34]. By differentiating enacted and internalised stigma, this study examines whether internalised stigma operates as a more proximal psychosocial catalyst of caregiver burden than outward discrimination.

Despite growing scholarship on caregiver burden in Nigeria, significant conceptual and empirical gaps remain. Existing Nigerian studies largely examine stigma or social support in isolation, overlooking the dynamic interplay between stressors and resources central to Stress Process Theory. Stigma is also frequently operationalised as a unidimensional construct, obscuring the differential effects of internalised versus enacted stigma on caregiver burden. Importantly, no Nigerian study has systematically compared caregiver burden across neurological illness categories (e.g., epilepsy, autism spectrum disorder, cerebral palsy), despite clear differences in seizure unpredictability, behavioural dysregulation, cognitive impairment, and functional dependence that may generate distinct stress profiles. This limits condition-sensitive intervention design. Furthermore, few study has simultaneously examined multidimensional stigma, social support, and illness type to determine both predictive and group-difference effects. Beyond theoretical advancement, this agenda carries public health urgency, directly advancing SDG 3.4 (mental health and wellbeing) and SDG 10 by addressing disability-related inequities in caregiving contexts.

Guided by Pearlin's Stress Process Theory, this study investigates caregiver burden among parents of children with neurological and neurodevelopmental conditions in Nigeria, with a specific focus on Ibadan. The study conceptualises caregiver burden as the primary outcome variable emerging from the interaction between psychosocial stressors and coping resources. Perceived stigma is operationalised as a multidimensional construct comprising enacted and internalised stigma, while social support is examined as a key buffering resource. Additionally, the study examines variations in caregiver burden across neurological illness categories to determine whether condition-specific symptom profiles produce differential stress experiences.

Materials and Methods

Study Design

The study adopted a cross-sectional survey design, theoretically grounded in the Stress Process Model of caregiving, which conceptualises caregiver burden as an outcome of interacting contextual, psychosocial, and illness-related stressors. This framework informed the selection of key predictors, including child clinical characteristics, parental psychological factors, and psychosocial variables, in explaining burden among parents of children with neurological and neurodevelopmental conditions. The cross-sectional approach enabled simultaneous measurement of these factors and estimation of their independent and combined associations with caregiver burden.

Study Sample

Participants were 264 parents of children with neurological and neurodevelopmental conditions recruited from Oluyole Cheshire Home for the Disabled and the Outpatient Clinic for Children with Neurological Disorders, College of Medicine, University of Ibadan, Nigeria. The inclusion criteria for this study were: (i) being a parent or primary caregiver of a child diagnosed with a neurological or neurodevelopmental condition, (ii) having a child receiving care at either Oluyole Cheshire Home or the outpatient neurology clinic, (iii) willingness to participate in the study, (iv) ability to understand and communicate in English or Yoruba, and (v) provision of informed consent. Parents who did not meet the inclusion criteria were excluded from this study.

Sample and Participant Recruitment

Purposive sampling was employed to recruit participants. This approach was considered appropriate because it enabled the deliberate selection of parents and primary caregivers of children with neurological and neurodevelopmental conditions who met the study's inclusion criteria. Participants were recruited from two care settings in Ibadan, Oyo State: Oluyole Cheshire Home for the Disabled and the Outpatient Clinic for Children with Neurological Disorders, College of Medicine, University of Ibadan. These facilities were selected because they provide access to parents managing children with complex neurological and neurodevelopmental diagnoses, including attention-deficit/hyperactivity disorder (ADHD), Down syndrome, cerebral palsy, epilepsy, seizures, and autism spectrum disorder.

Before recruitment commenced, ethical approval was obtained from the UI/UCH Ethics Review Committee, with institutional endorsement from the Chief Medical Advisory Committee (CMAC) at UCH. Formal approval was then secured from the Head of the Paediatrics Department for data collection at the Children's Outpatient Clinic, while a separate approval letter was submitted to the management of Oluyole Cheshire Home before commencement of field activities. Following institutional permissions, collaboration was established with clinicians and relevant care staff, who facilitated identification of eligible participants through clinic records and routine service contact points.

Eligible participants were parents or primary caregivers aged 25 to 65 years who had children diagnosed with neurological or neurodevelopmental conditions, were able to communicate in English or Yoruba, and provided informed consent. Individuals who did not meet these criteria were excluded. A total of 264 participants were recruited.

Data Collection

Data collection was conducted over a three-month period using structured questionnaires administered in English and Yoruba. To improve inclusiveness across varied educational backgrounds and to enhance comprehension, both self-administered and interviewer-administered formats were used. This dual approach supported participation among respondents who preferred verbal administration and helped improve response accuracy.

In the outpatient clinic, questionnaires were administered directly to eligible parents during clinic attendance. In Oluyole Cheshire Home, where some parents were not resident with their children, facility-supported distribution procedures were used to ensure that questionnaires reached parents and were completed by them. Across both settings, 264 questionnaires were administered and retrieved for analysis.

The response rate was moderate, which contributed to the extended three-month data collection window. Delays in questionnaire return, difficulty reaching non-resident parents, and variable willingness to participate affected response speed. Despite these challenges, repeated follow-up and sustained field engagement strengthened coverage of the target caregiver population and improved the representativeness of the final sample.

These two facilities were selected because they provide access to a diverse population of families managing chronic childhood neurological and neurodevelopmental conditions, including epilepsy, Down syndrome, attention deficit hyperactivity disorder (ADHD), seizures, cerebral palsy, and autism spectrum disorder. The outpatient clinic, as a specialised service point within a tertiary medical setting, offers structured clinical management for children with complex neurological needs and enables recruitment of parents actively engaged in ongoing treatment. Oluyole Cheshire Home for the Disabled was included to capture caregiver experiences within a residential and rehabilitative care context. Together, these settings provided complementary healthcare and social care perspectives relevant to caregiver burden.

Instruments

Data for this study were collected using a self-report questionnaire, which was divided into the following sections: Socio-demographic information in the present study comprised participants' gender, age, highest educational qualification, marital status, religious affiliation, ethnicity, employment status, and caregiving duration, also nature of illness.

Zarit Burden Interview - Short Version

The Caregiver Burden was measured using Zarit Burden Interview - Short Version. ZBI measures the emotional and psychological burden experienced by parents. It was developed by Steven Zarit, the ZBI initially contained 22 items, but the short version consists of 12 items to reduce the time burden while maintaining validity and reliability^[35]. A high score of each item is rated on a 5-point Likert scale ranging from 0 (never) to 4 (nearly always), with a total score between 0 and 48. Higher scores reflect a greater burden, with cut-off points categorizing burden levels as little to none (0–10), mild to moderate (10–20), moderate to severe (20–30), and severe (30–48). Cronbach's alpha values often exceeding

0.85, the ZBI-12 is widely validated and frequently used in research and clinical settings to measure caregiver distress in parents, helping professionals design appropriate interventions to reduce stress and improve well-being.

Stigma Scale for Chronic Illnesses (SSCI-8)

Perceived stigma one of the psychosocial variables were collected using the Stigma Scale for Chronic Illnesses (SSCI-8) is a brief, self-report measure designed to assess the perceived stigma experienced by individuals with chronic health conditions [24]. This 8-item short version was adapted from the original SSCI to offer a more efficient tool for research and clinical use, while still capturing the essential aspects of stigma related to chronic illness. The scale measures enacted and internalized stigma and is reported separately. The Cronbach's alpha typically ranging between 0.88 and 0.91, indicating high reliability. Responses are rated on a 4-point Likert scale from 1 (strongly disagree) to 4 (strongly agree), with higher scores indicating greater levels of stigma. This tool is particularly relevant for parents, as many experience social judgment and self-stigmatization due to their caregiving responsibilities. This scale has been used in studies to measure both enacted and internalized dimensions of stigma to understand how negative perceptions affect psychological well-being, interpersonal relationships, and mental health outcomes [24].

The Multidimensional Scale of Perceived Social Support (MSPSS)

The Multidimensional Scale of Perceived Social Support (MSPSS), developed by Zimet is a 12-item questionnaire designed to measure perceived social support from three key sources: family, friends, and significant others. Items are rated on a 7-point Likert scale from 1 (very strongly disagree) to 7 (very strongly agree), yielding a total score between 12 and 84. Higher scores indicate greater levels of perceived support, with categorization into low (12–35), moderate (36–60), and high (61–84) social support [37]. This tool is especially useful in parents research, as social support is a crucial factor in buffering stress, reducing emotional burden, and improving mental well-being. The MSPSS is widely validated across different populations and is frequently used in mental health, social work, and caregiving studies to assess the availability and impact of support systems.

Quality of Sleep (Pittsburgh Sleep Quality Index - Short Version)

The shortPSQI was created using an exploratory factor analysis (FA) to select 13 questions from the original PSQ. The PSQI assesses sleep quality over a one-month period using a 7-item scale. It was Originally developed by Buysse, the short version of the PSQI consists of 7 core items, which provide a comprehensive evaluation of sleep quality, duration, disturbances, and daytime dysfunction. The items have a cronbach alpha of 0.94. Each component is scored on a 0–3 scale, leading to a global score ranging from 0 to 21. Higher scores reflect worse sleep quality, with a cut-off score of ≤ 4 indicating good sleep quality and > 4 indicating poor sleep quality. The PSQI is widely utilized in clinical and research settings to identify sleep disturbances in parents, who often experience disrupted sleep due to nighttime caregiving responsibilities. Understanding sleep patterns in parents is crucial, as poor sleep quality has been linked to

increased stress, emotional exhaustion, and reduced caregiving efficiency.

Ethical Approval

Ethical approval for the study was obtained from the University of Ibadan/University College Hospital (UI/UCH) Ethics Review Committee (Ref: UI/EC/24/0098). Institutional permission for data collection was also obtained from the Chief Medical Advisory Committee (CMAC) and the Head of the Paediatrics Department, UCH, as well as the management of Oluyole Cheshire Home for the Disabled. The study adhered to core ethical principles, including informed consent, confidentiality, voluntary participation, and the right to withdraw at any point without penalty. Before data collection, the study purpose and procedures were clearly explained to all participants in English or Yoruba. Responses were anonymised and securely handled to protect privacy. Participants were assured that non-participation would not affect the care or services received by them or their children.

Data Analysis Strategy

Data were analysed using the Statistical Package for the Social Sciences (SPSS, version 27). Descriptive statistics, including means, standard deviations, and frequency distributions, were computed to summarise participants' demographic characteristics. Hierarchical multiple regression analysis was conducted to examine the independent and combined effects of psychosocial and illness-related predictors on caregiver burden. Assumptions of normality, linearity, homoscedasticity, independence of errors, and multicollinearity were assessed and met. Residuals were approximately normally distributed based on histogram and normal P–P plot inspection. Scatterplots indicated linearity and homoscedasticity. The Durbin–Watson statistic fell within the acceptable range, and tolerance and Variance Inflation Factor values indicated no multicollinearity concerns.

Caregiver burden was treated as the dependent variable. Perceived stigma and social support were entered as continuous predictors, while demographic variables were coded as categorical controls. Nature of illness was included as a categorical variable. Variables were entered hierarchically in four blocks based on theoretical considerations. Model 1 included demographic and caregiving characteristics (gender, age, and caregiving duration). Model 2 added enacted and internalised stigma. Model 3 added social support variables (family support, friend support, and significant-other support). Model 4 added quality of sleep. Statistical significance was set at $p < .05$. One-way analysis of variance (ANOVA) was conducted to examine differences in caregiver burden across illness categories, with post-hoc tests performed where appropriate.

Results

The demographic characteristics of the participants are presented in Table 1. A total of 264 parents of children with neurological and neurodevelopmental conditions participated in the study. The sample consisted predominantly of female caregivers ($n = 196$, 74.2%), while 68 participants (25.8%) were male. Participants' ages ranged from 25 to 65 years, with a mean age of 38.66 years ($SD = 7.87$). Most participants identified as Yoruba ($n = 242$, 92.4%),

while smaller proportions were Igbo (n = 14, 5.3%) or belonged to other ethnic groups (n = 6, 2.3%). Regarding religious affiliation, 148 participants (56.5%) were Christians and 114 (43.5%) were Muslims.

Educational attainment varied across the sample. The largest proportion of participants reported Higher National Diploma (HND) qualifications (n = 92, 35.4%), followed by Senior Secondary Certificate Examination (SSCE) (n = 68, 26.2%), Bachelor's degree (BSc) (n = 54, 20.8%), and National Diploma (ND) (n = 34, 13.1%), while 10 participants (3.8%) reported postgraduate qualifications (MSc/PhD). Most participants were married (n = 228, 86.4%), while 30 (11.4%) were single, 4 (1.5%) were divorced, and 2 (0.8%) reported being separated. Participants reported diverse employment backgrounds. The most commonly reported occupations included business-related work (n = 48, 18.2%), trading (n = 44, 16.7%), self-employment (n = 38, 14.4%), and teaching-related occupations (n = 54 combined for teacher/teaching, 20.4%), with smaller proportions engaged in civil service,

farming, engineering, fashion design, and other occupations. Caregiving duration varied substantially, ranging from 1 to 16 years. The most frequently reported durations were 1 year (n = 64, 24.2%) and 3 years (n = 64, 24.2%), followed by 2 years (n = 42, 15.9%) and 5 years (n = 40, 15.2%). Regarding the nature of the child's illness, seizure and epilepsy-related conditions were the most prevalent (n = 118, 44.7%), followed by cerebral palsy or motor developmental impairment (n = 52, 19.7%). Other reported conditions included Down syndrome (n = 22, 8.3%), other or unspecified neurological conditions (n = 22, 8.3%), autism spectrum disorder (n = 18, 6.8%), neuromuscular disorders (n = 16, 6.1%), ADHD (n = 8, 3.0%), and stroke/CVO (n = 8, 3.0%).

With respect to caregivers' personal health status, the majority reported no medical condition (n = 232, 87.9%), while 24 participants (9.1%) reported hypertension and 8 (3.0%) reported persistent headaches.

Table 1: Descriptive statistics of study variables for the total Sample

Category	Subcategory	n	%	$\bar{X}$	SD
Gender	Male	68	25.8		
	Female	196	74.2		
Age (years)		264		38.66*	7.87*
Highest educational qualification	MSc/PhD	10	3.8		
	BSc	54	20.5		
	HND	92	34.8		
	ND	34	12.9		
	SSCE	68	25.8		
	Other/invalid	2	0.8		
Marital status	Single	30	11.4		
	Married	228	86.4		
	Divorce	4	1.5		
	Separated	2	0.8		
Religion	Christianity	148	56.5		
	Islam	114	43.5		
Ethnicity	Yoruba	242	92.4		
	Igbo	14	5.3		
	Others	6	2.3		
Employment status (grouped)	Trading	64	24.2		
	Business	48	18.2		
	Teaching	54	20.4		
	Self-employed	38	14.4		
	Civil servant	10	3.8		
	Other occupations	42	15.9		
	Unemployed/None	2	0.8		
	Student	2	0.8		
Caregiving duration (grouped)	< 1 year	64	24.2		
	1–<2 years	42	15.9		
	2–<3 years	64	24.2		
	3–<5 years	14	5.3		
	5–<8 years	60	22.7		
	8+ years	20	7.6		
Nature of illness	Seizure and epilepsy related	118	44.7		
	Cerebral palsy/motor developmental impairment	52	19.7		
	Autism spectrum	18	6.8		
	Down syndrome	22	8.3		
	ADHD	8	3.0		
	Stroke/CVO	8	3.0		
	Neuromuscular disorder	16	6.1		
	Other/unspecified neurological or developmental conditions	22	8.3		

*Mean and standard deviation reported for continuous variable.

Table 2 presents the zero-order Pearson correlation coefficients among caregiver burden, perceived stigma (total, enacted, and internalised), social support (total support and its subscales), quality of sleep, and selected demographic and caregiving variables.

Several significant relationships were observed in relation to caregiver burden. Caregiver burden showed significant positive correlations with total perceived stigma ($r = .52, p < .01$), enacted stigma ($r = .50, p < .01$), and internalised stigma ($r = .50, p < .01$), indicating that higher levels of perceived stigma were associated with greater caregiver burden. Caregiver burden was also positively associated with age ($r = .32, p < .01$) and caregiving duration ($r = .20, p < .01$), suggesting that older caregivers and those who had provided care for longer periods reported higher levels of burden.

In contrast, caregiver burden demonstrated significant negative correlations with total social support ($r = -.22, p < .01$), family support ($r = -.13, p < .05$), friend support ($r = -.21, p < .01$), and significant-other support ($r = -.16, p < .05$). These results indicate that higher levels of perceived support were associated with lower caregiver burden. Associations between caregiver burden and quality of sleep ($r = .12, p = .051$) were positive but did not reach statistical significance. Strong intercorrelations were observed within the stigma measures. Total perceived stigma was highly correlated with

enacted stigma ($r = .99, p < .01$) and internalised stigma ($r = .94, p < .01$), while enacted stigma and internalised stigma were also strongly related ($r = .87, p < .01$). Similarly, the social support indices showed strong positive relationships, with total social support correlating with family support ($r = .80, p < .01$), friend support ($r = .79, p < .01$), and significant-other support ($r = .69, p < .01$), indicating substantial overlap among the support sources.

Additional associations were also observed among demographic variables and psychosocial indicators. Age was positively associated with caregiving duration ($r = .40, p < .01$) and with stigma indicators, while it showed negative correlations with total social support ($r = -.22, p < .01$) and its subscales. Caregiving duration was positively associated with stigma measures and quality of sleep, indicating that longer caregiving periods were linked to higher perceived stigma and poorer sleep quality.

The correlation analysis indicates that stigma variables demonstrated the strongest positive relationships with caregiver burden, while social support variables showed protective associations, highlighting the importance of psychosocial factors in shaping caregiver burden among parents of children with neurological and neurodevelopmental conditions.

Table 2: Zero-order correlations of demographic variables, caregiver burden, psychosocial and illness indicators (perceived stigma and social support)

Variable	M	SD	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender	1.74	0.44	1.00												
2. Age	38.66	7.87	-.00	1.00											
3. Caregiving Duration	3.64	2.90	-.01	.40**	1.00										
4. Nature of Illness	2.80	2.34	.02	.16*	-.01	1.00									
5. Total Perceived Stigma	15.86	6.94	-.13*	.18**	.33**	-.01	1.00								
6. Enacted Stigma	12.18	5.49	-.11	.16*	.32**	-.02	.99**	1.00							
7. Internalised Stigma	5.67	2.60	-.15*	.17**	.34**	.01	.94**	.87**	1.00						
8. Total Social Support	53.37	15.97	-.04	-.22**	.04	-.14*	-.17**	-.16**	-.14*	1.00					
9. Family Support	19.54	6.98	-.04	-.17**	.13*	-.07	-.13*	-.13*	-.07	.80**	1.00				
10. Friend Support	12.09	7.97	.00	-.18**	-.07	-.15*	-.16**	-.16*	-.17**	.79**	.43**	1.00			
11. Significant Other Support	21.74	5.90	-.06	-.15*	.04	-.10	-.08	-.08	-.05	.69**	.40**	.29**	1.00		
12. Quality of Sleep	9.60	6.16	-.16**	.13*	.24**	.01	.16**	.19**	.09	-.10	.04	-.16**	-.09	1.00	
13. Caregiver Burden	20.81	9.40	-.01	.32**	.20**	.01	.52**	.50**	.50**	-.22**	-.13*	-.21**	-.16*	.12	1.00

Table 3 presents the results of a hierarchical regression analysis conducted to examine the independent and joint prediction of demographic characteristics, caregiving factors, perceived stigma, social support, and sleep quality on caregiver burden among parents of children with neurological and neurodevelopmental conditions in Ibadan, Nigeria.

In Model 1, the demographic and caregiving variables (gender, age, and caregiving duration) were entered. The model was statistically significant, $F(3,252) = 10.51, R = 0.33, R^2 = 0.11, p < 0.001$, indicating that these variables jointly accounted for 11% of the variance in caregiver burden. Among the predictors, age emerged as a significant positive predictor of caregiver burden ($\beta = 0.27, t = 4.19, p < 0.001$), suggesting that older caregivers reported higher levels of burden. Gender and caregiving duration did not significantly predict caregiver burden ($p > 0.05$).

In Model 2, stigma variables (enacted stigma and internalised stigma) were added to the predictors. The inclusion of these variables significantly improved the model, $F(5,250) = 23.99, R = 0.57, R^2 = 0.32, \Delta R^2 = 0.21, p < 0.001$, indicating that stigma variables explained an additional 21% of the variance

in caregiver burden beyond the demographic variables. Both enacted stigma ($\beta = 0.29, t = 2.71, p < 0.01$) and internalised stigma ($\beta = 0.22, t = 2.04, p < 0.05$) significantly predicted caregiver burden, indicating that higher levels of stigma were associated with greater caregiver burden.

In Model 3, social support variables (significant-other support, family support, and friend support) were introduced. The overall model remained statistically significant, $F(8,247) = 15.50, R = 0.58, R^2 = 0.33, p < 0.001$, explaining 33% of the variance in caregiver burden. However, the addition of social support variables did not produce a significant improvement in explained variance ($\Delta R^2 = 0.01, p > 0.05$). None of the social support subscales significantly predicted caregiver burden ($p > 0.05$), although stigma variables and age remained associated with caregiver burden.

In Model 4, quality of sleep was added to the predictors. The overall model remained statistically significant, $F(9,246) = 13.76, R = 0.58, R^2 = 0.34, p < 0.001$, explaining approximately 34% of the variance in caregiver burden. However, the inclusion of sleep quality did not significantly improve the model ($\Delta R^2 = 0.001, p > 0.05$), and quality of

sleep did not significantly predict caregiver burden ($\beta = 0.03$, $t = 0.46$, $p > 0.05$). In the final model, age ($\beta = 0.24$, $p < 0.001$), enacted stigma ($\beta = 0.28$, $p < 0.05$), and internalised stigma ($\beta = 0.22$, $p < 0.05$) remained significant predictors of

caregiver burden, while caregiving duration, social support variables, and sleep quality were not significant predictors ($p > 0.05$).

Table 3: Hierarchical multiple regression predicting caregiver burden among parents of children with neurological and neurodevelopmental conditions in Ibadan, Nigeria

Variables	Model 1 B	SE	B	Model 2 B	SE	β	Model 3 B	SE	β	Model 4 B	SE	β
Gender	.269	1.256	.013	1.507	1.112	.071	1.402	1.114	.066	1.500	1.136	.071
Age	.324	.077	.272***	.301	.068	.253***	.282	.070	.237***	.281	.070	.236***
Caregiving duration	.368	.214	.112	-.168	.198	-.051	-.157	.205	-.048	-.174	.209	-.053
Enacted stigma				.491	.181	.290**	.490	.183	.289**	.467	.190	.276*
Internalised stigma				.794	.390	.223*	.757	.392	.212	.801	.404	.224*
Family support							.053	.084	.040	.048	.085	.036
Friend support							-.089	.069	-.076	-.084	.071	-.071
Significant other support							-.108	.091	-.069	-.104	.091	-.066
Quality of sleep										.040	.086	.026

Model	R	R ²	Adj. R ²	ΔR^2	ΔF	Sig. ΔF
1	.334	.111	.101	.111	10.51	.000
2	.569	.324	.311	.213	39.42	.000
3	.578	.334	.313	.010	1.23	.298
4	.579	.335	.311	.001	0.21	.646

Table 4 presents the results of a one-way analysis of variance conducted to examine whether caregiver burden differed across the nature-of-illness categories among parents of children with neurological and neurodevelopmental conditions in Ibadan, Nigeria.

The overall test was statistically significant, $F(7,256) = 4.07$, $p < 0.001$, indicating that caregiver burden significantly differed across illness categories. Descriptive statistics showed variation in mean caregiver burden across the illness groups. The highest mean burden was observed among caregivers of children with neuromuscular disorders ($M = 25.75$, $SD = 10.12$) and stroke/CVO ($M = 25.25$, $SD = 13.38$), followed by cerebral palsy or motor developmental impairment ($M = 24.19$, $SD = 9.79$) and Down syndrome ($M = 23.64$, $SD = 6.02$). Lower mean burden scores were observed among caregivers of children with seizure and epilepsy-related conditions ($M = 19.36$, $SD = 8.99$), autism spectrum disorder ($M = 18.22$, $SD = 9.39$), and ADHD ($M = 18.25$, $SD = 6.65$). The lowest mean caregiver burden was reported among caregivers of children with other or unspecified neurological or developmental conditions ($M = 15.64$, $SD = 7.65$).

Post-hoc comparisons using the Least Significant Difference (LSD) test revealed several statistically significant pairwise differences. Caregivers of children with cerebral palsy reported significantly higher caregiver burden than those caring for children with seizure and epilepsy-related conditions ($p = .001$) and autism spectrum disorder ($p = .016$). Similarly, caregivers of children with neuromuscular disorders reported significantly higher burden than those caring for children with seizure and epilepsy-related conditions ($p = .008$), autism spectrum disorder ($p = .016$), and other or unspecified neurological conditions ($p = .001$).

In addition, caregivers of children with stroke/CVO reported significantly higher caregiver burden than those caring for children with other or unspecified neurological conditions ($p = .011$). Caregivers of children with Down syndrome also reported significantly higher burden than those caring for children with seizure-related conditions ($p = .043$) and other neurological conditions ($p = .004$).

Overall, these findings suggest that caregiver burden varies significantly across illness categories, with higher burden particularly associated with neuromuscular disorders, stroke-related conditions, and cerebral palsy.

Table 4: One-way ANOVA comparing caregiver burden across nature-of-illness categories

Source	Sum of Squares	Df	Mean Square	F	P
Between groups	2330.110	7	332.873	4.071	.000
Within groups	20930.421	256	81.759		
Total	23260.530	263			

LSD

Illness Category (I)	Illness Category (J)	Mean Difference (I-J)	SE	p
Seizure/epilepsy	Cerebral palsy	-4.84*	1.51	.001
Seizure/epilepsy	Down syndrome	-4.28*	2.10	.043
Seizure/epilepsy	Neuromuscular disorder	-6.39*	2.41	.008
Cerebral palsy	Autism spectrum	5.97*	2.47	.016
Cerebral palsy	Other neurological conditions	8.56*	2.30	.000
Down syndrome	Other neurological conditions	8.00*	2.73	.004
Stroke/CVO	Other neurological conditions	9.61*	3.73	.011
Neuromuscular disorder	Seizure/epilepsy	6.39*	2.41	.008
Neuromuscular disorder	Autism spectrum	7.53*	3.11	.016
Neuromuscular disorder	Other neurological conditions	10.11*	2.97	.001

Discussion

The present study examined the psychosocial and illness-related predictors of caregiver burden among parents of children with neurological and neurodevelopmental conditions in Ibadan, Nigeria. Grounded in Pearlin's Stress Process Theory, the study sought to move beyond descriptive accounts of caregiver strain by systematically analysing how stigma, social support, and illness characteristics interact to shape caregiving outcomes. The findings indicate that caregiver burden is not simply a function of caregiving intensity but emerges from a complex interaction of psychosocial stressors, structural constraints, and illness-related demands. Most notably, perceived stigma both enacted and internalised emerged as the most robust predictor of caregiver burden, while social support demonstrated a weaker and conditional role than theoretically anticipated. In addition, caregiver burden varied significantly across illness categories, underscoring the importance of condition-specific caregiving demands. These findings extend existing caregiving literature by highlighting the centrality of stigma within low-resource contexts such as Nigeria.

Stigma as a Central Psychosocial Mechanism

One of the most significant findings of this study is the strong and consistent association between perceived stigma and caregiver burden. Both enacted and internalised stigma showed moderate positive correlations with caregiver burden and significantly increased explained variance in the regression model. This finding is consistent with prior research demonstrating that stigma is a major predictor of psychological distress and caregiver strain among parents of children with developmental and neurological conditions [16,17]. These studies suggest that stigma contributes to emotional exhaustion by exposing caregivers to social rejection, blame, and isolation.

From a theoretical perspective, this finding aligns with Pearlin's Stress Process Theory, which conceptualises stigma as a secondary stressor that exacerbates caregiving burden. However, the strength of the association observed in this study suggests that stigma may function as more than a secondary stressor in the Nigerian context. Empirical evidence indicates that in low- and middle-income settings, stigma is often structurally embedded in cultural beliefs and social institutions, shaping caregiving experiences at multiple levels [22]. For example, it was found that Nigerian caregivers of children with autism frequently experience blame and moral judgement, which intensifies psychological distress and discourages help-seeking [25].

The distinction between enacted and internalised stigma further explains this relationship. While enacted stigma involves direct discrimination, internalised stigma reflects the psychological internalisation of societal attitudes. Research shows that internalised stigma is particularly harmful because it undermines self-efficacy and promotes social withdrawal [27]. This may explain why caregivers in the present study who reported higher stigma also experienced greater burden internalised negative beliefs likely reduced coping capacity and increased emotional strain.

Moreover, the strong intercorrelation between enacted and internalised stigma suggests that these processes are mutually reinforcing rather than independent. Exposure to discrimination may lead caregivers to internalise negative societal beliefs, which in turn increases sensitivity to perceived judgement. This cyclical process has been

documented in stigma research, where external and internal stigma interact to produce sustained psychological distress [37].

Importantly, cultural interpretations of neurological conditions in Nigeria may intensify stigma. Conditions such as epilepsy and cerebral palsy are sometimes associated with supernatural or moral explanations, which can reinforce blame-oriented narratives directed at parents. Such beliefs create a social environment in which caregivers are not only managing care demands but also navigating social scrutiny and judgement. This dual burden likely contributes to the strong relationship between stigma and caregiver burden observed in this study.

Social Support as a Conditional Resource

Contrary to expectations, social support did not emerge as a significant predictor of caregiver burden in the multivariate model, despite showing protective associations at the bivariate level. This pattern suggests that the role of social support may be more complex and context-dependent than traditionally assumed. While the stress-buffering model posits that social support mitigates the impact of stressors, empirical evidence indicates that its effectiveness may be limited under conditions of high psychosocial strain [29].

One possible explanation is that stigma may suppress or mediate the effects of social support. Previous studies have shown that caregivers experiencing high levels of stigma are more likely to withdraw from social networks and avoid seeking help due to fear of judgement. In such cases, the availability of support does not necessarily translate into its utilisation. This could explain why social support did not significantly predict caregiver burden once stigma was accounted for in the regression model.

Additionally, the nature and quality of support available to caregivers may influence its effectiveness. The Multidimensional Scale of Perceived Social Support measures perceived availability but does not capture adequacy or cultural relevance. In resource-constrained settings like Nigeria, support networks may be inconsistent or insufficient to meet the demands of caregiving. Studies have shown that urbanisation and economic pressures are weakening traditional extended family systems, reducing the reliability of informal support [19].

Furthermore, social networks themselves may sometimes reinforce stigma rather than alleviate it. Caregivers may encounter judgement or misunderstanding within their communities, which can transform potential support systems into sources of stress. This aligns with findings from 30, who reported that social relationships do not always function as protective factors in caregiving contexts.

Taken together, these findings suggest that social support should not be conceptualised as universally protective. Instead, its effectiveness depends on broader social conditions, including stigma and structural resource availability. This calls for a more comprehensive understanding of social support within caregiving research.

Illness-Related Differences in Caregiver Burden

The study found significant differences in caregiver burden across illness categories, with the highest burden reported among caregivers of children with neuromuscular disorders, stroke-related conditions, and cerebral palsy. This finding is consistent with existing literature indicating that caregiver burden is strongly influenced by the level of functional

impairment and caregiving intensity associated with a child's condition [38,18].

Conditions such as cerebral palsy and neuromuscular disorders typically involve high levels of physical dependency, requiring continuous assistance with daily activities, mobility, and medical care. These demands are both time-intensive and physically exhausting, particularly in contexts where formal support services are limited. It was reported that parents of children with cerebral palsy often experience significant physical and emotional strain due to the constant nature of caregiving tasks [38].

In contrast, conditions such as epilepsy may involve episodic symptoms that, while stressful, do not require continuous physical caregiving. This distinction highlights the importance of differentiating between caregiving intensity and diagnostic category. Caregiver burden appears to be more closely linked to daily care demands than to the illness label itself.

These findings also reflect structural limitations within the Nigerian healthcare system. Limited access to rehabilitation services, assistive devices, and specialised care places additional responsibility on caregivers, increasing burden. As noted in previous research, when healthcare systems lack capacity, caregiving responsibilities are effectively transferred to families [7].

Age and Caregiver Burden

The finding that age significantly predicted caregiver burden is consistent with prior research showing that older caregivers often report higher levels of strain [14]. This may be due to declining physical health, reduced energy levels, and the cumulative effects of long-term caregiving.

However, age may also reflect broader structural and contextual factors. Older caregivers in Nigeria may face economic constraints, limited access to healthcare, and reduced social support. Additionally, caregiving responsibilities may accumulate over time, leading to chronic stress and burnout. These findings suggest that age-related differences in caregiver burden are not solely due to individual factors but are shaped by systemic conditions.

Practical and theoretical Implications

The findings of this study have important implications for caregiving theory, particularly the application of Stress Process Theory in low-resource contexts. First, the central role of stigma suggests that psychosocial stressors may be more structurally embedded than the model assumes. Rather than functioning solely as secondary stressors, factors such as stigma may shape the entire caregiving experience. Also, the limited role of social support challenges the assumption that support universally buffers stress. Instead, support appears to be conditional, depending on the presence of stigma and the availability of resources. Then, the variation in caregiver burden across illness categories highlights the need to incorporate illness-specific factors into theoretical models. Caregiving is not a uniform experience, and models must account for differences in care demands and disease trajectories.

These findings suggest the need for a more context-sensitive adaptation of Stress Process Theory that incorporates structural and cultural factors.

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Conclusion

Caregiver burden among parents of children with neurological and neurodevelopmental conditions in Ibadan, Nigeria, is substantially associated with psychosocial stressors, particularly perceived stigma, alongside differences in caregiving demands across illness categories. The major findings include the significant predictive roles of enacted and internalised stigma and age, the limited independent contribution of social support and sleep quality in the final regression model, and significant variations in burden across illness categories. Addressing these challenges requires stigma-reduction interventions, accessible psychosocial support, and condition-sensitive caregiver services. Applying Stress Process Theory within the Nigerian context is essential for understanding how psychosocial stressors, available resources, and illness-related demands interact to shape caregiver burden. Future efforts should prioritise culturally appropriate interventions, stronger caregiver support systems, and further research across diverse settings to inform targeted strategies for reducing caregiver burden among affected families.

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