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Assessing Caregivers' Strain and Quality of Life in Acute Stroke: Opportunity for Policy and Education

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Abstract

Background

Stroke places a significant physical, emotional, and financial demand not only on patients but also on the informal caregivers, particularly in low- and middle-income countries, where formal support systems are inadequate. Caregivers' burden and quality of life (QoL) remain understudied in the acute phase of stroke care in Nigeria.

Objective

To assess caregivers' strain and the quality of life of caregivers of acute stroke patients and identify associated determinants in two tertiary hospitals in Nigeria.

Methodology:

This hospital-based prospective cross-sectional study was conducted among 161 primary caregivers of acute stroke patients admitted to Benue State University Teaching Hospital, Makurdi, between April 2021 and March 2023. Data were collected using a structured questionnaire and validated instruments: Zarit Burden Interview (ZBI), Caregiver Strain Index (CSI), WHOQOL-BREF, and Hospital Anxiety Depression Scale (HADS). Patients' functional state was assessed using the modified Rankin Scale (mRS). Data was analyzed using SPSS version 21, with statistical significance set at $p < 0.05$.

Result

The mean age of caregivers was 38.9 ± 12.4 years, with females constituting 64.6%. Most caregivers spent (Mean ± SD) 18.14 ± 5.8 hours daily with patients. The mean ZBI score was 23.4 ± 10.7, indicating mild to moderate burden, although 88.2% experienced significant strain on the CSI with mean score of 9.24 ± 2.10. The mean WHOQOL-BREF score was 58.8 ± 8.12 which indicates moderate QoL; the environmental domain scored highest. Monthly income and hospital admission duration were significant determinants of caregiver burden, while monthly income was significantly associated with QoL.

Conclusion

Caregivers of acute stroke patients experienced significant caregiving strain, despite an overall moderate QoL. Financial constraints and prolonged hospital admission significantly increased caregiver burden, underscoring the need for caregiver-focused psychosocial and economic support and education of acute stroke care services.

Introduction

Stroke is a sudden vascular event with neurological consequences that can affect the brain, retina, or spinal cord [1]. Globally, stroke is the second leading cause of death and ranks third as a cause of disability [2]. The global incidence of death from stroke is significantly disproportionate between high-income and low-income countries, as the majority, 70% of strokes and 87% of deaths and disability-adjusted life years from stroke, occur in the latter [3]. Global burden of disease (GBD) reported an increase in stroke lifetime risk in persons greater than 25 years from 22.8% in 2016 to 24.9% in 2021 [4].

A caregiver has been defined as a stroke patient's family member who usually provides the most important support during the acute, recovery, and rehabilitation stages of the illness. The caregiver can also be described as an unpaid person who lives with the physical care or manages the disease and is most closely involved in taking care of them while in the hospital or at home [5].

The attention required by patients who have suffered an acute stroke is meticulous, time-bound, and usually a major factor in the recovery process [6]. The role of the caregiver, often underestimated at this point, extends beyond psychological support to include financial burdens, especially in resource-poor settings where medical insurance remains a distant reality for many [7]. This basis provides every reason to worry, not only for the patient but also for those who, by choice or by force, are saddled with the responsibility to care for the affected [2].

Caregiver role strain, or caregiver strain, is a complex and multidimensional construct that includes subjective and objective factors in which the demands of care, the impact of the patient's disease process, and the physical, psychological, social, and financial implications accompany a negative reaction to care-related activities [8]. Caregiver strain also describes physical, emotional, and mental stress experienced by caregivers when their responsibilities exceed their coping capacity [9]. The strain or stress experienced by caregivers of a stroke patient is a significant concern. Studies have demonstrated that the responsibility of caregiving in acute stroke falls largely on females as well as spouses and children, who are usually non-breadwinners in the family [10, 11]. Unfortunately, the psychological toll itself has also been demonstrated in the form of mental health problems for both patients and caregivers [12, 13]. Furthermore, personal caregiver experiences have recounted feelings of imprisonment, loneliness, and future uncertainty, among others, as they help their loved ones [14].

Quality of life (QoL) is a complex, multidimensional construct that is useful in addressing the emotional, psychological, and social challenges faced by caregivers. The physical and emotional demands of caregiving make caregivers vulnerable to physical and psychological distress similar to that experienced by patients [15]. Many caregivers report a significant decline in their quality of life, as well as physical and mental health, when fully engaged in caregiving. They often face challenges such as changing family roles, reduced income, sleep deprivation, limited leisure time, and work-related stress [16]. The QoL of stroke patients' caregivers is strongly tied to the disease burden, with an inverse relationship; furthermore, the caregiver's physical health, financial capacity, and relationship with the patient all play significant roles as well [17]. According to a study by Imarhiagbe et al in a tertiary hospital in Benin City,

Edo State, Nigeria, the mean Zarit Burden Index (ZBI) score was significantly higher in those who reported that caregiving was taking a toll on their health compared to those who did not [18].

This study seeks to assess caregivers' strain and the quality of life of caregivers of acute stroke patients and to identify associated factors in two tertiary hospitals in Nigeria. It is anticipated that the findings from this study will provide insight into the needs of caregivers of acute stroke patients and the possibility of integrating caregiver-focused interventions into acute stroke care in Nigeria.

Methodology

Study Design, Size, and Setting

This hospital-based prospective cross-sectional study assessed 161 caregivers of acute stroke patients admitted to the emergency unit or medical wards of a teaching hospital in Nigeria. The sample size was determined by including all eligible consecutive caregivers of acute stroke patients presenting during the study period (April 2021–March 2023). This approach ensured adequate representation of the target population.

This study was carried out at the Benue State University Teaching Hospital in Makurdi, Benue State, Nigeria. Acute stroke patients admitted between April 2021 and March 2023, and their caregivers were studied during this period.

Ethical Issues

Ethical approval

for the study was obtained from the Health Research Ethical Committee with number BSUTH/MKD/HREC/2020/020, and informed consent was obtained from all participants, with strict confidentiality assured and maintained with the data obtained.

Study Procedure

Participants were recruited consecutively for the study if they were the primary caregivers of the acute stroke patients and were at least 18 years old. Acute stroke patients were defined as patients presenting within 30 days of stroke. While primary caregivers of acute stroke patients were defined as the main informal, unpaid individuals who provide care and assistance to manage the daily needs of persons diagnosed with acute stroke during hospitalization. Such persons are the main caregivers who attended to their patient during admission. They were excluded if they were less than 18 years old, declined to participate, were financially compensated for caregiving, or had pre-existing chronic medical illnesses like diabetes mellitus, heart failure, mood disorders, or psychiatric illness. The recruited caregivers were required, under guidance, to complete a structured questionnaire containing demographics and

questions related to caregiving, such as relationship with the patient, family size, hours spent caregiving, etc. The Zarit Burden Interview (ZBI), Caregiver Strain Index (CSI), World Health Organization (WHOQOL) Bref questionnaire, and Hospital Anxiety Depression (HADS) instruments were interviewer-administered to the primary caregivers. The modified Rankin score (mRS) of acute stroke patients was assessed. This is a six-point scale that ranges from 0 to 6, with higher scores denoting worse clinical outcomes [19]. Scores of 0–3 were categorized as a good outcome (no disability), scores of 4–5 as handicapped, and a score of 6 as dead [20]. Data completeness was ensured at the point of collection through interviewer-administered questionnaires. All questionnaires were checked for completeness before data entry. There were no significant missing data, and complete case analysis was performed. Potential sources of bias, including selection bias and interviewer bias, were minimized through consecutive recruitment and the use of standardized interviewer-administered instruments.

Zarit Burden Instrument

Caregiver burden was assessed using ZBI, which has been validated in Nigeria [21]. The Zarit Burden Interview (ZBI) was developed to measure subjective burden among caregivers of adults with dementia. Items were generated based on clinical experience with caregivers and prior studies, resulting in a 22-item self-report inventory that examines burden associated with functional/behavioral impairments and the home care situation. The items are worded subjectively, focusing on the affective response of the caregiver.

Each question is scored on a 5-point Likert scale ranging from a score of 0 (never) to a score of 4 (nearly always present). Total scores range from 0 (low burden) to 88 (high burden). Score values and interpretation are as follows: 0 to 20 means little or no burden; 21 to 40 means mild to moderate burden; 41 to 60 means moderate to severe burden; and 61 to 88 means severe burden [22].

Caregiver Strain Index (CSI)

CSI was used to estimate the level of burden of caring for stroke survivors with cognitive impairment on caregivers. It is a 13-item questionnaire that measures strain related to taking care of stroke survivors with cognitive impairment (it is reported that the CSI construct validity is supported by correlations with the physical and emotional health of the caregiver and with the subjective view of the caregiving situation). CSI has a high internal consistency (0.86). There is at least one item for each of the following major domains: employment, physical, financial, social, and time. Positive responses to seven or more items on the index indicate a greater level of strain. The CSI consists of 13 items that are posed to caregivers as questions. The caregivers have to answer “Yes” or "No." A “No” is given a value of “0,” while a “Yes” is given a value of "1." The CSI is then computed by summing “0” (No) and “1” (Yes) responses to give a total of 13; in other words, the sum of the scores of several “Yes” answers. This simply means that the CSI scores range from 0 to 13. Positive responses to seven or more on the index indicate a greater level of stress; a score of 7 or more would indicate a greater level of stress. [23].

WHOQOL-Bref Instrument

The World Health Organization Quality of Life Short Version (WHOQOL-BREF) instrument was interviewer-administered to all the participants. The WHOQOL-BREF is a short version of the WHOQOL-100 instrument. The instrument is useful in large research studies or clinical trials and has been utilized worldwide. The WHOQOL-BREF questionnaire is a reliable and valid instrument [24]. This instrument is generic and not disease-specific, as it can be used for assessing HRQoL in patients with diseases like stroke. The WHOQOL-BREF is a 26-item questionnaire made up of domains and facets. Domains are broad groupings of related facets. The four domain types in the instrument include physical health (7 items), psychological health (6 items), social relations (3 items), and environment (8 items), as well as a general health facet (2 items). A facet is a specific aspect of life for which a coherent definition could be articulated. Of the 26 items of the WHOQOL-BREF, the items on overall rating of HRQoL and subjective satisfaction with health are not included in the domains but are used to form a facet on overall HRQoL and general health.

Each item of the WHOQOL-BREF is rated on a 5-point Likert-type scale. Domain scores are scaled in a positive direction (i.e., higher scores denote higher HRQoL). The mean score of items within each domain is used to calculate the mean domain score. After computing the scores, they were transformed linearly to a 0-100 scale using the guidelines through the WHO standardized graph instrument to make them comparable to the scores in WHOQOL-100 [25]. Quality of life was classified as “good” or “poor” based on the mean score. Scores above the mean indicated a good quality of life, while scores at or below the mean indicated a poor quality of life. [26]

Hospital Anxiety Depression Scale (HADS)

This was used to assess the presence of anxiety and depression. The HADS contains 14 items and consists of two subscales: anxiety and depression. Each item is rated on a four-point scale, giving maximum scores of 21 for anxiety and depression each. Scores of 11 or more on either subscale are a significant case of psychological morbidity, while scores of 8–10 represent borderline, and 0–7 are normal [27].

Data Analysis

Data was analyzed using the Statistical Package for Social Sciences (SPSS) software (version 21; IBM SPSS Statistics). Descriptive statistics was used to present the sociodemographic and clinical characteristics of the respondents in frequencies and percentages. The means and standard deviations were computed and presented for the modified Rankin Score (mRS), total ZBI, total WHOQOL-BREF and total CSI. Also, the WHOQOL-BREF's domains’ raw scores were computed and presented alongside their corresponding transformed scores. The relationship between categorical variables like sociodemographic, clinical characteristics and ZBI as well as WHOQOL BREF was tested using Fisher’s Exact Test. Subsequently, Analysis of Variance (ANOVA) was used to test the relationship between

significant socio-demographic and clinical factors with ZBI and WHOQOL BREF. Finally, post hoc comparison was carried out using the Tukey HSD test using the assumption that the variances were equal. The level of significance for all analysis was set at $p \leq 0.05$.

Results

A total of 161 caregivers were recruited into the study.

Table 1 shows the socio-demographic characteristics of the caregivers.

Table 1
Socio-demographic Characteristics of the Caregivers (n = 161)

Characteristic	Frequency (n)	Percent (%)
Age		
≤20	6	3.7
21–30	34	21.1
31–40	52	32.3
41–50	22	13.7
51–60	23	14.3
61–70	15	9.3
71–80	9	5.6
Sex		
Male	57	35.4
Female	104	64.6
Marital Status		
Single	53	32.9
Married	101	62.7
Separated/divorced	1	0.6
Widowed	6	3.7
Level of formal education		
None	52	32.3
Primary	11	6.8
Secondary	34	21.1
Tertiary	64	39.8
Occupation		
Formal	51	31.7

The majority of the respondents were aged 31–40 years 52(32.3%), and the least frequent age group, ≤ 20 years, accounted for 6(3.7%). There were more females 104(64.6%) than males among the caregivers. Most of them were married 101(62.7%), had tertiary education 64(39.8%), were informally employed like artisans, private business etc. 65(40.4%), and earned below N30,000 per month 70(43.5%).

Characteristic	Frequency (n)	Percent (%)
Age		
Informal	65	40.4
Unemployed	45	28.0
Monthly income		
< 30,000	70	43.5
31,000–60,000	38	23.6
61,000-100,000	30	18.6
101,000-200,000	16	9.9
201,000-500,000	6	3.7
≥ 501,000	1	0.6
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Table 2 presents the acute stroke patient's clinical and caregiving characteristics.

Table 2
Acute Stroke Patient Clinical and Caregiving Characteristics

Variable	Frequency	Percentage
Duration of stroke in days		
1–10	98	60.9
11–20	43	26.7
21–30	20	12.4
Duration of admission in days		
1–10	131	81.9
11–20	27	16.9
≥21	2	1.2
Patient's stroke type		
Ischaemic	132	87.9
Primary intracerebral haemorrhage	25	15.5
Subarachnoid haemorrhage	4	2.5
Number of caregivers		
1–4	132	82.0
5–10	29	18.0
Number of hours spent with patient daily		
1–8	11	6.8
9–16	34	21.2
17–24	116	72.0

The majority, 98(60.9%) of the respondents cared for patients whose stroke were within 10 days of onset, stayed on admission for 1–10 days 131(81.9%), and suffered an ischaemic stroke 132(80.7%). Most of the caregivers spent 17–24 hours with their patients 116(72.0%) and the responsibility of caregiving was shared between 1–4 family members in 132(82%).

The mean mRS, ZBI, CSI, WHOQOL-BREF, and HADS scores of caregivers are shown in Table 3.

Table 3
Mean mRS, ZBI, CSI, WHOQOL-BREF and HADS of Caregivers

Variable	Mean	Standard Deviation
Modified Rankin Score (mRS)	3.74	1.16
Zarit Burden Index (ZBI)	23.40	10.70
Caregiver Strain Index	9.24	2.10
WHOQOL Bref	58.8	8.12
HADS Anxiety	4.99	2.49
HADS Depression	8.33	3.85

The patients with stroke had a mean modified Rankin score of 3.74 ± 1.16 while the median score was 4 which indicates moderately severe disability. This means that the patients have suffered a significant neurological deficit following the stroke that has resulted in loss of independence. The mean ZBI score was 23.4 ± 10.7 which implies mild to moderate level of caregiving burden. Also, the mean WHOQOL BREF score was 58.8 ± 8.12 with about one-third of the caregivers, 49(29.2%) having poor quality of life. The mean CSI score was 9.24 ± 2.10 which shows greater level of caregiving stress. While the HADS anxiety was 4.99 ± 2.49 and HADS depression was 8.33 ± 3.85 which implies normal and borderline anxiety and depression respectively.

Figure 2 illustrates the caregiving strain index distribution among the respondents.

Table 4 shows the WHOQOL-BREF domain scores among the caregivers.

Table 4
WHOQOL-BREF domains' scores among the Caregivers

Domain	Raw Score	Transformed Score (0-100)
Physical Health	22.06	56
Psychological Health	21.06	63
Social Relationship	10.60	56
Environment	28.91	69
General Health	5.99	50

The environmental domain recorded the highest mean transformed score 69. indicating relatively better satisfaction with environmental factors such as safety, financial resources, accessibility to healthcare services, and living conditions. Psychological health also demonstrated a relatively favorable score of 63, suggesting moderate emotional well-being and coping ability among caregivers. The physical health and social relationship domains had a comparable transformed mean score of 56, reflecting a moderate

quality of life in relation to physical functioning, energy levels, social support, and interpersonal relationships. However, the general health perception domain recorded the lowest score of 50.

Table 5
Relationship between Caregivers Characteristics and Zarit Burden Index

Variable	Little or no Burden	Mild to Moderate Burden	Moderate to Severe Burden	Severe Burden	Fischer's exact test p -value
Age					
18–39 years	42	38	2	0	0.024*
≥ 40 years	36	31	11	1	
Sex					
Male	22	25	9	2	0.008*
Female	56	43	3	2	
Marital status					
Married	29	26	5	0	0.895
Unmarried	49	43	8	1	
Educational status					
Educated	52	42	13	1	0.019*
Uneducated	26	26	0	0	
Employment status					
Employed	55	49	12	0	0.139
Unemployed	23	20	1	1	
Monthly income					
< 100,000 Naira	67	53	11	1	0.341
≥ 100,000 Naira	10	16	2	0	
Stroke type					
Ischaemic	67	53	11	1	0.477
Haemorrhagic	11	16	2	0	
Stroke onset duration					
1–14 days	59	58	9	1	0.444
15–30 days	19	11	4	0	

Variable	Little or no Burden	Mild to Moderate Burden	Moderate to Severe Burden	Severe Burden	Fischer's exact test p -value
Age					
Admission duration					
1–14 days	72	64	9	1	0.184
≥ 15	5	5	3	0	
Modified Rankin Score					
1–3 (Good outcome)	36	19	3	0	0.029*
4–5 (Handicapped)	37	47	10	1	

Table 5 shows the relationship between caregivers' characteristics and Zarit Burden Index categories. There was a significant relationship between ZBI groups and some variables like age of caregivers (p = 0.024), sex (p = 0.008), educational status (p = 0.019), and the modified Rankin stroke outcome score of the patients (p = 0.029).

Table 6 presents the analysis of variance for sociodemographic and clinical characteristics associated with caregiver burden (ZBI).

Table 6
Analysis of Variance for sociodemographic/clinical characteristics and ZBI among the caregivers

Characteristics	*df*	F	p
Age of caregivers	42	0.912	0.623
Monthly income of caregivers	5	3.392	0.007*
Stroke duration	23	0.969	0.513
Admission duration	16	2.039	0.017*

Monthly income and admission duration are significantly associated with ZBI (p = 0.007 and p = 0.017), respectively, while the remaining characteristics are not significant as shown above. Post hoc comparisons using the Tukey HSD test revealed no significant difference in ZBI between any two specific groups of monthly income. Post hoc tests were not performed for admission duration because it was not a categorical variable.

Table 7 presents the analysis of variance for socio-demographic and clinical characteristics associated with WHOQOL-BREF scores.

Table 7
Analysis of Variance for some Socio-demographic/Clinical Characteristics and WHOQOL BREF among the Caregivers

Characteristics	***df***	**F**	**p**
Age of caregivers	42	0.895	0.648
Monthly income of caregivers	5	4.027	0.004*
Stroke duration	23	0.404	0.992
Admission duration	16	1.310	0.209

Monthly income (p=.004) is significantly associated with WHOQOL BREF, while the remaining variables are not. Post hoc comparison using the Tukey HSD test reveals that the mean score for those earning less than N30,000 per month (M = 60.4, SD = 7.8) is significantly lower than for those earning N61,000 – N100,000 (M = 66.6, SD = 7.2, p=.012), while the rest were not.

Discussion

This study assessed caregiver strain and quality of life among caregivers of acute stroke patients in two tertiary hospitals in Nigeria. The findings highlight a substantial caregiving burden, high levels of strain, and moderate impairment in quality of life among caregivers. The predominance of female caregivers, 64.4% observed in this study is consistent with reports from Nigeria and other low- and middle-income countries, where caregiving roles are culturally assigned to women and close family members rather than formal care systems [10, 11, 28, 29].

The majority of patients were within 10 days of stroke onset and had short hospital stays (1–10 days), reflecting the acute phase of stroke, when care demands are typically highest. Most patients had an ischaemic stroke, consistent with global and Nigerian epidemiological patterns where ischaemic stroke accounts for the majority of cases [30].

Caregivers in this study spent prolonged hours (17–24 hours daily) with patients, and caregiving was mostly shared among 1–4 individuals. This reflects the family-centered caregiving model common in Nigeria, where formal institutional care is limited. Similar findings have been reported in sub-Saharan Africa, where caregiving responsibilities are intensive and largely informal [31].

The mean Zarit Burden Index (ZBI) score of 23.4 indicates a mild-to-moderate burden, although a smaller proportion experienced severe burden. This aligns with studies by Adeloye et al, which reported moderate caregiver burden among stroke caregivers in Nigeria [32]. However, the Caregiver Strain Index (CSI) mean score of 9.24 suggests high caregiver strain, with the majority (88.2%) experiencing significant stress. The high level of strain observed is consistent with findings from a study by Rigby et

al., which shows that early post-stroke caregiving is particularly stressful due to sudden role changes, uncertainty, and high dependency levels of patients [33]. In contrast, our finding was lower than the 96.7% reported by Akosile et al in a tertiary hospital among informal primary caregivers of acute stroke patients [34]. This difference may not be unconnected to environmental and cultural factors that could heighten caregivers' strain. Also, the apparent discrepancy between ZBI and CSI in the present study may be due to differences in measurement constructs: while ZBI assesses perceived burden, CSI captures day-to-day strain and stress, which may be more pronounced in the acute phase of stroke.

The mean Modified Rankin Score (mRS) of 3.74 indicates moderate to severe disability, implying that most patients were dependent on caregivers for activities of daily living. This level of disability significantly contributes to caregiver burden. A statistically significant association was found between mRS and caregiver burden, supporting existing evidence that greater patient disability is a key predictor of caregiver burden [35]. Caregivers of patients with poorer functional outcomes (mRS 4–5) experienced higher levels of burden [35].

The mean score of the WHOQOL-BREF (58.8) indicates moderate quality of life, with about one-third of caregivers experiencing poor QoL. Domain analysis showed the highest score in the environmental domain (69)—suggesting relative satisfaction with external conditions such as safety and healthcare access. Moderate scores in psychological (63), physical (56), and social (56) domains, and the lowest score in general health perception (50). This pattern suggests that while caregivers may adapt psychologically and socially, their perceived overall health is compromised, likely due to physical exhaustion and emotional stress. Similar trends have been reported in studies from low- and middle-income countries, where caregivers often report reduced physical well-being and general health despite moderate coping ability [36].

The Hospital Anxiety and Depression Scale (HADS) results showed normal anxiety levels (mean 4.99) and borderline depression (mean 8.33). This suggests that depressive symptoms may be emerging even in the early phase of caregiving, possibly due to sustained stress and uncertainty. A previous study by Greenwood et al. has similarly reported higher rates of depression than anxiety among stroke caregivers [37].

Factors found to have a significant relationship with caregivers' burden were age, sex, educational status, and modified Rankin score. Older caregivers experienced a higher burden, possibly due to reduced physical resilience and competing health issues. Female caregivers had a higher burden, consistent with cultural expectations where women often assume primary caregiving roles. This aligns with global evidence showing female caregivers experience greater emotional and physical strain [38]. Caregivers' educational level may influence coping strategies and access to information, thereby affecting perceived burden. As expected, greater disability increases caregiving demands and burden [39].

Furthermore, monthly income and admission duration were significantly associated with caregiver burden. Lower income likely increases financial stress, contributing to a higher burden, while a longer

hospital stay increases caregiving demands and emotional fatigue. These findings are consistent with studies highlighting socioeconomic status as a key determinant of caregiver burden [40]. In the same vein, the present study demonstrated that monthly income is a significant determinant of caregivers' quality of life, while age, stroke duration, and admission duration were not significantly associated. The significant association between income and QoL underscores the critical role of financial capacity in caregiving, particularly in low-resource settings such as Nigeria, where healthcare financing is largely out-of-pocket. Caregivers with higher incomes are more likely to afford supportive care, medications, and ancillary services, thereby reducing stress and improving overall well-being.

This finding aligns with previous studies, which reported that financial strain is a major contributor to reduced quality of life among caregivers [37, 40]. In contrast, caregivers with limited financial resources often experience increased psychological stress, reduced access to care resources, and poorer living conditions. Interestingly, age was not significantly associated with QoL in this study, despite being associated with caregiver burden. This suggests that while older caregivers may experience greater burden, their overall perception of quality of life may be influenced by adaptation, cultural expectations, or coping mechanisms.

Similarly, stroke duration and admission duration were not significantly associated with QoL. This may reflect the acute nature of the study population, where caregiving experiences are still evolving, and long-term effects on quality of life may not yet be fully established. Previous studies have shown that the impact of caregiving on QoL becomes more pronounced in the chronic phase of stroke [41]. These findings highlight that economic factors play a more critical role in determining caregivers' quality of life than clinical variables in the acute phase of stroke.

Overall, the findings emphasize the need for holistic stroke care models that incorporate caregiver assessment, psychosocial support, financial protection strategies, particularly in low-resource settings, and caregivers' education to enhance coping strategies. As such, it may be generalizable to similar tertiary healthcare settings in low-resource environments.

Limitations

This study has some limitations. Firstly, the cross-sectional design precludes causal inferences between caregiver burden, quality of life, and associated factors. Longitudinal studies would better elucidate changes in caregiver outcomes over time.

Secondly, caregivers were assessed during the acute phase of stroke while patients were hospitalized, which might have underestimated the magnitude of burden experienced during long-term home-based care following discharge.

Thirdly, it was conducted in a single tertiary hospital; hence, the findings may not be fully generalizable to caregivers in primary or secondary healthcare settings or rural communities. Finally, detailed patient

factors such as cognitive impairment and post-discharge functional outcomes were not explored and may further influence caregiver burden and QoL.

Conclusion

Caregivers of acute stroke patients experienced a high level of caregiving strain, mild to moderate caregiving burden, and moderate quality of life. The elderly, female caregivers, those with lower educational levels, and those with greater disability were particularly vulnerable, with socio-economic factors playing a critical role in caregivers' burden and QoL. Although severe burden was uncommon in the acute phase, objective strain was prevalent, highlighting the hidden impact of caregiving responsibilities. substantial caregiving burden, high levels of strain, and moderate impairment in QoL among caregivers. These findings underscore the importance of integrating caregiver-focused interventions into stroke care, including early psychosocial screening, caregiver education, and financial support mechanisms. Addressing caregiver needs is essential for improving both caregiver well-being and stroke recovery outcomes. Future longitudinal and interventional studies are recommended to guide sustainable caregiver support policies in resource-limited settings.

Declarations

Ethics approval and consent to participate

Ethical approval for this study was obtained from the Health Research Ethics Committees of Benue State University Teaching Hospital, Makurdi, Nigeria. The study was conducted in accordance with the ethical principles outlined in the Declaration of Helsinki. Written informed consent was obtained from all participants before enrollment in the study. Participation was voluntary, and confidentiality of all collected data was strictly maintained.

Consent for publication

Not applicable. The manuscript does not contain any person's identifiable data in any form.

Declarations

The authors declare that they have no competing interests.

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Author Contribution

EUI, EON and YAA conceptualized the study and the design; data collection was carried out by SSU, and EON; data analysis and interpretation were done by MA and EUI. Initial manuscript was drafted by SSU and revised by EUI, OE and EON. All authors actively critically reviewed the manuscript for important intellectual content and approved the final version of the manuscript.

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Data Availability

The datasets generated and/or analyzed during the current study are not publicly available due to institutional data protection policies. Still, they can be provided through the corresponding author upon reasonable request.

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Figures

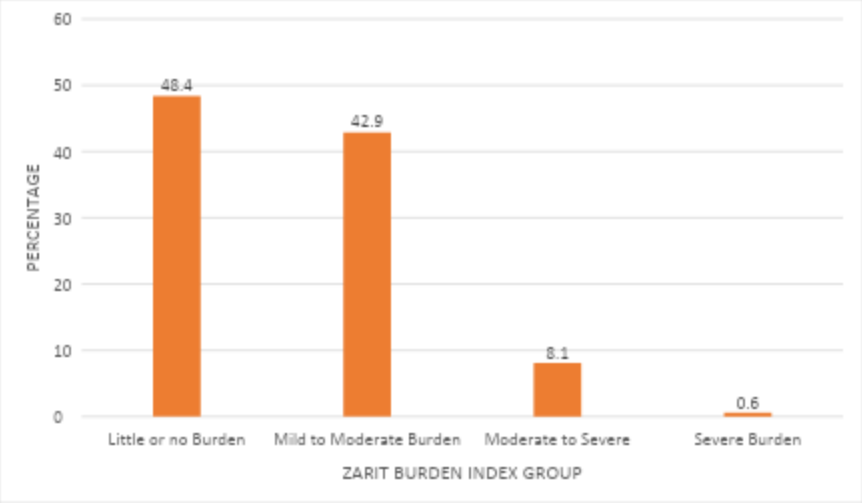


Figure 1

Distribution of the Caregivers across the Zarit Burden Index Groups

About half, 78(48.4%) of the caregivers had little to no burden while 4(0.6%) had severe burden. Other details are as in Figure 1 above.

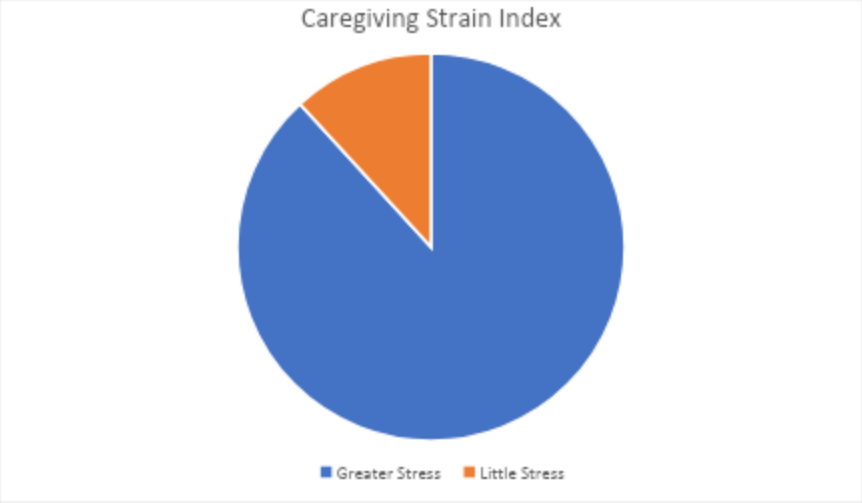


Figure 2

Caregiving Strain index of the respondents (n=161)

Most caregivers 142 (88.2%) experienced greater stress, while the minority 19(11.8%) experienced mild stress.