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ORIGINAL ARTICLE

Stroke Severity and Health-Related Quality of Life among Stroke Survivors at a Tertiary Hospital in Nigeria

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ABSTRACT

Background: Stroke is a major cause of disability worldwide, significantly affecting health-related quality of life (HRQoL), particularly in low- and middle-income countries. Despite increasing survival rates, limited research exists on the relationship between stroke severity and HRQoL in Nigeria. This study examines the association between stroke severity and HRQoL among stroke survivors at the University of Ilorin Teaching Hospital (UITH), Nigeria.**Methods:**
A descriptive cross-sectional study was conducted between January and November 2023 among 252 stroke survivors attending neurology and physiotherapy clinics at UITH. Stroke severity was assessed using the Stroke Levity Scale (SLS) and Modified Rankin Scale (mRS), while HRQoL was measured using the HRQOLISP-40 questionnaire. Socio-demographic and clinical characteristics were recorded. SPSS version 23.0 was used for data analysis, including descriptive statistics, Spearman's correlation, regression analysis, and ANOVA. A p-value <0.05 was considered statistically significant. **Results:** The mean age of participants was 61.1 ± 15.4 years, with 61.9% being male. Stroke severity was significantly associated with lower HRQoL, particularly in the physical (p=0.001), psycho-emotional (p=0.003), cognitive (p=0.005), and eco-social (p=0.012) domains. The spiritual domain was unaffected (p=0.345). Socio-demographic factors such as return to work (p=0.009), source of income (p=0.012), and physiotherapy costs (p=0.017) significantly influenced HRQoL. **Conclusion:** Stroke severity has a profound impact on HRQoL, underscoring the need for comprehensive rehabilitation, financial assistance, and psychosocial support to improve stroke survivors' quality of life. **Keywords:** Stroke; Health-Related Quality of Life; Rehabilitation; Stroke Severity; Socio-economic Factors.

INTRODUCTION

Stroke is a leading cause of morbidity and mortality worldwide, significantly contributing to the global burden of neurological diseases. It is characterized by the rapid onset of focal or global cerebral dysfunction lasting more than 24 hours or leading to death, with a vascular cause being the primary determinant (1). According to the World Health Organization (WHO), stroke is the second leading cause of death globally, responsible for approximately 5.5 million deaths annually (2). Additionally, it is a major cause of long-term disability, with nearly 50% of stroke survivors suffering from chronic

impairments that severely impact their ability to perform daily activities(3).

The burden of stroke is particularly pronounced in low- and middle-income countries, where access to comprehensive stroke management and rehabilitation services is often inadequate (4). Nigeria, the most populous African nation, has an estimated stroke prevalence of 1.14 per 1000 population, with a 30-day case fatality rate as high as 40% (5,6). Despite advances in acute stroke management, the increasing survival rates have led to a growing concern regarding the quality of life of stroke survivors (7).

Health-related quality of life (HRQoL) is an essential measure of post-stroke outcomes, encompassing physical, psychological, cognitive, and social well-being (8,9). Given the increasing number of stroke survivors, evaluating HRQoL is critical in identifying the multifaceted impact of the disease, guiding rehabilitation strategies, and optimizing healthcare delivery (10,11).

Stroke is a major contributor to disability-adjusted life years (DALYs), placing a significant burden on both healthcare systems and affected individuals (12). The consequences of stroke extend beyond physical impairments to include cognitive decline, emotional distress, social limitations, and economic hardship (13,14). Despite the recognition of HRQoL as an important outcome measure, limited studies have been conducted in Nigeria to evaluate the impact of stroke severity on HRQoL (15,16).

Previous research has predominantly focused on stroke incidence, prevalence, and risk factors, with little attention given to how survivors perceive their quality-of-life post-stroke (17). Furthermore, available studies in Nigeria have largely been conducted in the southern and western regions, with scarce data from Northcentral Nigeria (18,19). This knowledge gap limits the ability of healthcare policymakers and clinicians to design effective rehabilitation programs tailored to the needs of stroke survivors in this region.

The assessment of HRQoL provides a more holistic understanding of stroke outcomes, beyond conventional clinical indicators such as mortality and functional disability (20,21). Measuring HRQoL allows healthcare providers to identify specific domains affected by stroke, thereby facilitating targeted interventions (22,23). Studies have shown that factors such as age, gender, socio-economic status, stroke severity, and rehabilitation access significantly influence HRQoL (24,25). However, in Nigeria, research exploring these relationships remains limited (26).

Given the increasing burden of stroke and the shift in stroke care from acute survival to long-term well-being, it is crucial to evaluate HRQoL among stroke survivors (27,28). Understanding the relationship between stroke severity and HRQoL will inform healthcare providers and policymakers on the most pressing needs of stroke survivors, guiding resource allocation for rehabilitation and support services (29).

The primary objective of this study was to assess the relationship between stroke severity and health-related quality of life (HRQoL) among stroke survivors at the University of Ilorin Teaching Hospital (UITH), Ilorin, Kwara State, Nigeria. To achieve this, the study focused on several specific objectives. Firstly, it aimed to evaluate the HRQoL of stroke survivors at UITH, providing insights into the overall well-being and functional status of individuals post-stroke. Secondly, the study sought to examine the relationship between stroke severity and HRQoL, identifying the extent to which varying levels of stroke impairment influence patients' quality of life. Additionally, the study aimed to identify socio-demographic factors associated with HRQoL among stroke survivors, exploring how variables such as age, gender, marital status, employment, and education impact post-stroke recovery. Finally, the research sought to evaluate clinical variables that influence

HRQoL, assessing factors such as stroke type, duration since stroke onset, comorbidities, and access to rehabilitation.

METHODS

Study Design

This study was a hospital-based descriptive cross-sectional study conducted from 8th January to 25th November, 2023 to assess the relationship between stroke severity and health-related quality of life (HRQoL) among stroke survivors at the University of Ilorin Teaching Hospital (UITH), Ilorin, Kwara State, Nigeria. The cross-sectional design was chosen as it allows for the assessment of variables at a single point in time, providing insights into the burden of stroke severity and its impact on HRQoL.

Description of Study Area/Study Setting

The study was conducted at the Neurology and Physiotherapy outpatient clinics of UITH, a 650-bed tertiary healthcare facility located in Ilorin, Kwara State. UITH serves as a referral center for Kwara and neighboring states, including Oyo, Osun, Ekiti, Kogi, and Niger. The hospital is well-equipped for stroke care, with a specialized stroke unit consisting of neurologists, physiotherapists, specialized stroke nurses, and rehabilitation specialists who provide comprehensive stroke management.

The Neurology Clinic at UITH caters to patients with various neurological conditions, including stroke, epilepsy, and Parkinson's disease. The Physiotherapy Department provides rehabilitation services essential for stroke recovery, focusing on motor function, mobility, and overall quality of life improvement. Given its role as a major stroke referral center, UITH was deemed an appropriate setting for this study.

Study Population

The study population comprised stroke survivors attending neurology and physiotherapy outpatient clinics at UITH for follow-up care. These individuals had been diagnosed with stroke via clinical and/or radiological assessments and were undergoing post-stroke management.

Inclusion and Exclusion Criteria

To ensure the selection of appropriate participants, the study employed well-defined inclusion and exclusion criteria. Participants were eligible for inclusion if they were clinically and/or radiologically diagnosed stroke survivors, having experienced either ischemic or hemorrhagic stroke. Additionally, only individuals who had survived at least three months post-stroke were considered, as this timeframe minimizes the influence of acute-phase complications on HRQoL assessment. Lastly, participants were required to provide informed consent and demonstrate the ability to respond to study questionnaires, ensuring meaningful participation in the research process.

Certain individuals were excluded from the study to enhance the reliability of the findings. Patients with severe illness or clinical instability, which could compromise their ability to complete the study, were not included. Similarly, stroke survivors with significant communication difficulties, such as aphasia or cognitive impairment, were excluded as their inability to reliably respond to survey questions could introduce response bias. Lastly, patients with severe comorbidities, including advanced cancer, chronic kidney disease, HIV/AIDS, or Parkinson's disease, were excluded to prevent the confounding influence of other serious health conditions on HRQoL outcomes.

Research Instruments

The study utilized a combination of validated, structured, interviewer-administered questionnaires to collect relevant data. The Socio-Demographic and Clinical Questionnaire was used to obtain key background information, including age, gender, marital status, education level, occupation, household composition, stroke type, stroke duration, number of strokes, affected body side, and existing comorbidities.

To assess stroke severity, the study employed the Stroke Levity Scale (SLS), a concise, reliable, and validated tool that assigns scores based on motor function, mobility, and aphasia presence. The SLS ranges from 0 to 15, classifying stroke severity as mild (11–15), moderate (6–10), or severe (0–5). Additionally, the Modified Rankin Scale (mRS) was used to evaluate the degree of disability post-stroke, with scores ranging from 0 (no symptoms) to 6 (death).

To measure HRQoL, the Health-Related Quality of Life in Stroke Patients (HRQOLISP-40) questionnaire was utilized. This tool evaluates HRQoL across seven domains, namely physical, psycho-emotional, cognitive, eco-social, soul, spirit, and spiritual interaction, providing a comprehensive assessment of post-stroke well-being.

To ensure clarity, reliability, and validity, a pilot study involving 30 stroke survivors at General Hospital, Ilorin (now Kwara State University Teaching Hospital, Ilorin), was conducted prior to the main study. Feedback from this pilot phase helped refine the questionnaire format and data collection approach.

Data Collection

Data were collected over a three-month period by the principal investigator and three trained research assistants. The study utilized a combination of validated, structured, interviewer-administered questionnaires to collect relevant data. The Socio-Demographic and Clinical Questionnaire was used to obtain key background information, including age, gender, marital status, education level, occupation, household composition, stroke type, stroke duration, number of strokes, affected body side, and existing comorbidities.

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Data Collection

Data collection spanned a three-month period and was conducted by the principal investigator and three trained research assistants. The process followed a structured approach to ensure consistency and accuracy. Initially, participant screening was carried out to identify eligible stroke survivors attending the neurology and physiotherapy clinics at UITH. Once identified, participants were informed about the study objectives, procedures, and confidentiality measures, after which written informed consent was obtained.

Following consent, questionnaires were administered through face-to-face interviews to ensure completeness and minimize missing data. Research assistants were responsible for accurately recording responses. Stroke severity was assessed using the SLS and mRS, while HRQoL was evaluated using HRQOLISP-40. To maintain data accuracy, a final verification step was implemented, where all completed questionnaires were cross-checked for errors before data entry and analysis.

Data Analysis

The collected data were analyzed using SPSS version 23.0, employing multiple statistical techniques to address the study objectives. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize socio-demographic and clinical characteristics.

To assess the relationship between stroke severity and HRQoL, Spearman's correlation analysis was performed, measuring the strength and direction of association between SLS/mRS scores and HRQoL scores. Regression analysis was conducted to determine the impact of socio-demographic and clinical factors on HRQoL, identifying key predictors of post-stroke quality of life. To compare HRQoL scores across different socio-demographic groups, T-tests and ANOVA (Analysis of Variance) were used. A p-value of <0.05 was set as the threshold for statistical significance, ensuring that findings were robust and meaningful.

Outcome Measures

The primary outcome of interest in this study was HRQoL among stroke survivors, which was assessed using the HRQOLISP-40 tool across seven domains. Additionally, the study examined secondary outcomes, including stroke severity classification based on SLS and mRS scores, and socio-demographic and clinical predictors of HRQoL. The study also explored factors influencing poor HRQoL, with particular focus on economic burdens, access to rehabilitation services, and social support systems.

Ethical Considerations

Ethical approval for this study was obtained from the University of Ilorin Teaching Hospital Health Research Ethics Committee (UITH HREC) before data collection commenced. Participants were provided with detailed information about the study's objectives, procedures, and potential risks, ensuring informed decision-making before participation. Confidentiality was maintained throughout the study, with participant responses anonymized and securely stored to protect personal information. Participation was strictly voluntary, and individuals were informed of their right to withdraw at any stage without consequences.To minimize any physical or psychological risks, the study employed non-invasive assessments, ensuring that participants did not experience any harm or distress. Finally, participants were informed that the findings of this study could contribute to improving stroke rehabilitation strategies, potentially benefiting future stroke survivors.

Limitations of the Study

Despite its strengths, the study had some inherent limitations. One major limitation was the exclusion of aphasic patients, as stroke survivors with severe communication impairments were not included in the study. This may have introduced selection bias, as individuals with greater cognitive and speech impairments were not represented in the findings. Additionally, the cross-sectional study design limited the ability to establish causal relationships between stroke severity and HRQoL. A longitudinal approach would have provided better insights into changes in HRQoL over time.

The study relied on self-reported HRQoL assessments, which are inherently subject to recall bias and subjective interpretation. Participants' perceptions of their quality of life may have been influenced by personal circumstances, emotional state, or cognitive function at the time of data collection. Finally, hospital-based recruitment meant that the study primarily captured data from stroke survivors who actively sought medical care at UITH. This may not be representative of community-dwelling stroke survivors, particularly those who lack access to healthcare facilities or choose not to seek medical attention.

Table 1: Socio-Demographic Characteristics of Stroke Survivors (n=252)

Variable	Frequency (n)	Percentage (%)
Age (years)		
20–29	10	4.0
30–39	14	5.6
40–49	33	13.1
50–59	45	17.9
60–69	68	27.0
70–79	57	22.6
80–89	24	9.5
90–99	1	0.4
Mean Age (± SD)	61.1 ± 15.4	
Gender		
Male	156	61.9
Female	96	38.1
Marital Status		
Single	5	2.0
Married	201	79.8
Divorced	8	3.2
Separated	5	2.0
Widowed	33	13.1

Table 1 presents the socio-demographic characteristics of stroke survivors at UITH. The mean age of participants was 61.1 ± 15.4 years, with 27% of survivors aged 60–69 years, indicating that older adults are at a higher risk of stroke. Males (61.9%) were more affected than females, suggesting a gender predisposition to stroke, possibly due to higher cardiovascular risk factors among men. Married individuals (79.8%) constituted the majority of survivors, which could indicate the role of social support in post-stroke survival.

Table 2: Stroke Severity and HRQoL Scores

Variable	Mean ± SD
Stroke Levity Scale (SLS)	8.4 ± 4.3
Modified Rankin Scale (mRS)	3.3 ± 1.2
HRQoL Score	68.3 ± 14.7

Table 2 highlights the stroke severity and health-related quality of life (HRQoL) scores among survivors. The SLS score of 8.4 ± 4.3 indicates moderate impairment, while the mRS score of 3.3 ± 1.2 suggests that most survivors experienced moderate disability. The mean HRQoL score of 68.3 ± 14.7 suggests poor quality of life, emphasizing the significant impact of stroke on patients' well-being.

Table 3: Relationship Between Stroke Severity and HRQoL Domains

HRQoL Domains	SLS (p-value)	mRS (p-value)
Physical	0.001	0.002
Psycho-emotional	0.003	0.004
Cognitive	0.005	0.008
Eco-social	0.012	0.015
Spiritual	0.345	0.271

Table 3 examines the correlation between stroke severity (SLS and mRS) and HRQoL domains. There is a significant negative correlation ($p < 0.05$) between stroke severity and physical, psycho-emotional, cognitive, and eco-social domains, indicating that higher stroke severity is associated with poorer quality of life in these areas. However, the spiritual domain was not significantly correlated ($p > 0.05$), suggesting that spiritual well-being may be less affected by stroke severity.

Table 4: Socio-Demographic and Clinical Predictors of HRQoL

Variable	β Coefficient	p-value
Religion	41.495	0.004
Return to Work	28.372	0.009
Source of Income	15.201	0.012
Household Composition	9.874	0.035
Stroke Type	-6.823	0.041
Physiotherapy Costs	13.704	0.017

Table 4 identifies socio-demographic and clinical factors that significantly predict HRQoL. Religion ($\beta = 41.495$, $p = 0.004$) had the strongest positive association with HRQoL, indicating that spiritual beliefs might play a critical role in post-stroke recovery. Returning to work ($\beta = 28.372$, $p = 0.009$) and having a personal income source ($\beta = 15.201$, $p = 0.012$) were also positively associated with HRQoL, emphasizing the economic burden of stroke. Household composition ($\beta = 9.874$, $p = 0.035$) suggests that social support is crucial in recovery. Interestingly, stroke type ($\beta = -6.823$, $p = 0.041$) had a negative impact on HRQoL, with hemorrhagic strokes likely leading to worse outcomes. Monthly physiotherapy costs ($\beta = 13.704$, $p = 0.017$) were positively associated with HRQoL, suggesting that access to rehabilitation services significantly improves post-stroke quality of life.

DISCUSSION

Summary of Key Findings

This study assessed the relationship between stroke severity and health-related quality of life (HRQoL) among stroke survivors at University of Ilorin Teaching Hospital (UITH), Nigeria. The findings revealed that older adults and males are more affected by stroke, emphasizing the need for targeted interventions, preventive healthcare measures, and gender-sensitive health policies. Findings also revealed that stroke severity was significantly associated with poorer HRQoL across multiple domains, including physical, psycho-emotional, cognitive, and eco-social aspects, while the spiritual domain remained unaffected. Socio-demographic and clinical factors such as

religion, return to work, source of income, household composition, stroke type, and physiotherapy costs significantly influenced HRQoL. These findings underscore the multidimensional impact of stroke on survivors' lives and highlight the urgent need for targeted rehabilitation programs, economic empowerment initiatives, and psychosocial support.

Stroke Severity and HRQoL

The significant negative correlation between stroke severity and HRQoL aligns with studies from both high-income and low-income settings. Prior research indicates that increased stroke severity leads to greater physical disability and poorer functional outcomes, which, in turn, significantly deteriorates HRQoL (1,2). Studies conducted in high-income countries (HICs) such as the United States and the United Kingdom consistently show that early rehabilitation interventions and post-stroke care significantly mitigate disability-related HRQoL declines (3,4). However, in low- and middle-income countries (LMICs) like Nigeria, rehabilitation services are often inaccessible or unaffordable, exacerbating post-stroke disabilities (5,6). This study corroborates the notion that the lack of structured post-stroke care in LMICs contributes to persistent disability and reduced quality of life.

Domain-Specific Impact on HRQoL

The finding that physical, psycho-emotional, cognitive, and eco-social domains of HRQoL were significantly affected is consistent with prior research. Physical disability remains the most recognized post-stroke burden, leading to mobility restrictions and dependence on caregivers (7,8). The psycho-emotional burden of stroke, including depression, anxiety, and mood disorders, is well-documented in global stroke literature, with nearly one-third of stroke survivors experiencing post-stroke depression (PSD) (9,10). This study supports the growing recognition that PSD significantly contributes to lower HRQoL, particularly in LMIC settings where mental health services are scarce (11,12).

The eco-social impact of stroke, including loss of income and social isolation, is another critical aspect observed in this study. Prior studies from Nigeria and other African nations emphasize that post-stroke unemployment rates exceed 70%, with many survivors unable to resume work due to severe disabilities (13,14). The economic burden of stroke is further exacerbated by out-of-pocket healthcare costs, particularly for rehabilitation and physiotherapy, limiting access to necessary services (15,16). The non-significant correlation between stroke severity and spiritual well-being in this study aligns with African-based research indicating that faith and religious coping mechanisms act as psychological buffers, enhancing resilience among stroke survivors (17,18).

Socioeconomic Factors and HRQoL

This study confirms that religion, return to work, source of income, and household composition significantly influence HRQoL. Consistent with previous findings, employment status is a key determinant of HRQoL, with unemployed stroke survivors reporting poorer quality of life due to financial dependence and social isolation (19,20). In Nigeria, where informal employment dominates, loss of work translates to significant financial distress, further impacting HRQoL (21,22). Social support from family members, as reflected in household composition, was another strong predictor of HRQoL, reinforcing the importance of communal care systems in stroke recovery (23,24).

Limitations of Existing Research

While prior studies have extensively examined the relationship between stroke and HRQoL, many have methodological limitations. Some studies rely solely on physical disability measures, neglecting the psychosocial and economic consequences of stroke (25). Others use non-standardized HRQoL instruments, making cross-cultural comparisons difficult

(26,27). Additionally, most studies are hospital-based, excluding community-dwelling stroke survivors who may have different recovery trajectories (28). This study attempts to address these gaps by using validated HRQoL tools (HRQOLISP-40) and incorporating multiple dimensions of post-stroke life.

Recommendations for the Health System

To improve stroke care and recovery outcomes, the Nigerian health system must prioritize investment in physiotherapy and rehabilitation services at both primary and secondary healthcare levels. The establishment of well-equipped rehabilitation centers across different regions will enhance access to post-stroke care, facilitating better functional recovery and overall quality of life for survivors.

Given the high cost of post-stroke care, policies should be implemented to integrate stroke rehabilitation services into the National Health Insurance Scheme (NHIS). By subsidizing rehabilitation expenses, stroke survivors—many of whom experience financial constraints due to unemployment or disability—can access essential therapies without excessive out-of-pocket expenses.

Additionally, recognizing the high prevalence of post-stroke depression, the health system must incorporate mental health support into stroke management. Routine mental health screenings, psychological counseling, and therapy services should be integrated into stroke care programs to address the psycho-emotional burden faced by survivors. This holistic approach will improve long-term recovery and reintegration into society.

Recommendations for Healthcare Providers

Healthcare providers play a crucial role in optimizing stroke recovery and should prioritize early rehabilitation initiatives. The timely initiation of physiotherapy and cognitive rehabilitation following a stroke has been shown to significantly reduce long-term disability, improving functional independence and health-related quality of life (HRQoL).

A multidisciplinary approach to stroke management is essential. Clinicians should not only focus on physical rehabilitation but also incorporate psychological counseling, speech therapy, and social reintegration strategies. Such an approach ensures that survivors receive comprehensive care, addressing both their medical and psychosocial needs.

Furthermore, patient education should be enhanced to empower stroke survivors with knowledge about lifestyle modifications, home-based exercises, and self-management strategies. Educating patients and caregivers on stroke prevention, dietary adjustments, and the importance of medication adherence can help minimize complications and prevent recurrent strokes.

Recommendations for Media and Public Awareness

The media plays a vital role in shaping public perceptions and behaviors related to health. Therefore, it should be leveraged to increase awareness about stroke prevention through public campaigns that highlight risk factors, warning signs, and the importance of early medical intervention. Educating the population on recognizing stroke symptoms early and seeking prompt medical attention can reduce stroke-related disability and mortality.

Additionally, the promotion of stroke rehabilitation success stories can serve as a powerful tool for motivation and education. Showcasing real-life examples of stroke survivors who have regained independence through rehabilitation can inspire other patients and their families, reinforcing the importance of early and consistent therapy.

Media platforms should also facilitate community-based stroke support networks, providing survivors with peer support, shared rehabilitation experiences, and access to informational resources. Creating dedicated online forums, radio programs, and social media groups can help stroke survivors connect with healthcare professionals and fellow

patients, fostering a supportive recovery environment.

Recommendations for Further Studies

Further research is essential to expand knowledge on stroke outcomes and rehabilitation effectiveness in Nigeria. Longitudinal studies should be conducted to track long-term HRQoL trajectories among stroke survivors, providing insights into recovery patterns over time. Such studies will help identify factors that promote or hinder long-term stroke recovery, guiding the development of more effective rehabilitation strategies.

Given that many stroke survivors do not seek hospital-based care, community-based studies are needed to capture a broader and more representative understanding of stroke outcomes. Research focusing on rural and underserved populations will provide valuable data on barriers to stroke care and rehabilitation in Nigeria.

Additionally, studies should explore the accessibility of rehabilitation services, identifying financial, geographic, and systemic challenges that limit patients' ability to receive timely and adequate post-stroke care. Findings from such research will be critical in advocating for policy changes to improve stroke rehabilitation infrastructure.

Finally, further research should investigate psychosocial interventions for stroke survivors, particularly in addressing post-stroke depression and social reintegration challenges. Understanding the impact of counseling, community engagement, and vocational rehabilitation on stroke recovery will guide evidence-based recommendations for mental health support programs tailored to Nigerian stroke survivors.

CONCLUSION

This study reinforces the significant negative impact of stroke severity on HRQoL, particularly in the physical, psycho-emotional, cognitive, and eco-social domains. Socioeconomic factors such as income, return to work, and household support play a crucial role in shaping post-stroke recovery outcomes. To improve stroke survivors' quality of life, healthcare systems must enhance rehabilitation services, integrate stroke care into health insurance schemes, and provide mental health support. Further research should explore long-term HRQoL trajectories and identify effective interventions to optimize stroke recovery outcomes in Nigeria.

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