

Exploring the Correlation Between Sexual Function, Mental Health, and Quality of Life among Stroke Survivors in South-East Nigeria

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DOI: <https://doi.org/10.51244/IJRSI.2024.1108028>

Received: 06 July 2024; Revised: 21 July 2024; Accepted: 25 July 2024; Published: 02 September 2024

ABSTRACT

Stroke's multifaceted impact necessitates understanding its effects on survivors' psychological well-being, daily functioning, and sexual health. This study aimed to investigate the correlation between sexual function, mental health, and quality of life (QoL) among stroke survivors. This cross-sectional survey involved 82 stroke survivors recruited from selected healthcare centers in Nnewi. The stroke-specific QoL scale and Mental health inventory-38 were used to evaluate the QoL and mental health status of the participants, respectively. Male and female sexual functions were assessed using the International Index for Erectile Function and Female sexual index, respectively. Mann-Whitney U test and Spearman's rank order correlation were used to analyze data. The participants' mean total QoL score was 112.57 ± 37.67 , representing 46% of the maximum possible score, with the highest and lowest scores in vision (68.94%) and social role (24.39%) domains. The participants scored <50% in seven quality-of-life domains. The mean total mental health score was 141.76 ± 13.70 , with the highest and lowest scores in anxiety (70.75%) and emotional tie (50.71%) domains, respectively. Males had a mean total sexual function score of 30.80%, with none reaching the 50th percentile, except overall satisfaction (50.61%), while females scored 16.41%, with none reaching the 50th percentile and 0.0% in the pain domain. This study highlights the significant challenges stroke survivors face in QoL, mental health, and sexual function. The findings underscore the need for holistic and tailored interventions addressing these multidimensional aspects of post-stroke care, focusing on improving sexual well-being to enhance overall life satisfaction in male survivors.

Keywords: Sexual function; Mental health; Quality of life; Stroke survivors; Stroke rehabilitation

INTRODUCTION

Stroke is a devastating medical condition characterized by the sudden disruption of blood flow to the brain, leading to various physical and cognitive impairments, and it is a global health concern with significant implications for individuals and healthcare facilities [1]. This interruption may result from a blockage (ischemic stroke) or rupture of a blood vessel (hemorrhagic stroke) [2]. Common symptoms of stroke include sudden weakness or numbness in the face, arm, or leg, slurred speech, severe headache, and

difficulty walking or maintaining balance [3]. Depending on the severity and location of the stroke, survivors often experience long-term physical, cognitive, and emotional challenges that significantly impact their quality of life (QoL) [4]. Globally, stroke is a leading cause of disability and death [2]. Stroke is responsible for approximately 6.2 million deaths each year, making it the second most common cause of mortality worldwide [5]. The burden of stroke extends beyond mortality, as survivors are left with various disabilities, impacting their daily lives and overall well-being [2]. In the United States, stroke remains a significant public health concern. About 795,000 people experience a new or recurrent stroke each year, resulting in >140,000 deaths annually [6]. In Africa, stroke has an annual incidence rate of 316 per 100,000, a prevalence of 1,460 per 100,000, and a 3-year fatality rate >80% [7]. Nigeria, the most populous African nation, bears a significant portion of this burden [8].

With physical impairments, stroke survivors frequently experience mental health challenges, including depression, anxiety, and emotional distress [9]. The emotional toll of stroke can be debilitating, affecting not only the survivors but also their caregivers and family members [10]. Similarly, stroke survivors often experience several mental health issues, which can have a significant impact on their recovery and QoL [11]. Addressing mental health concerns in stroke survivors is crucial for optimizing rehabilitation outcomes and enhancing their long-term well-being; however, clinicians focus on motor functioning when treating patients with mild stroke [12]. Despite mild symptoms and little disability, depression, anxiety, and fatigue are prominent in mild stroke survivors. Therefore, mental health aspects of recovery and rehabilitation following mild stroke need to be assessed and addressed to promote a better QoL.

The overall QoL for stroke survivors is influenced by a complex interplay of physical, psychological, and social factors [13]. Stroke-related impairments, including limitations in mobility and activities of daily living, can significantly impact a survivor's sense of independence and well-being [4]. Understanding the holistic QoL experienced by stroke survivors is crucial for developing comprehensive healthcare interventions that address their needs. Stroke survivors frequently report a reduced QoL [14].

This study is important because it aimed to address the often-overlooked aspects of mental health and sexual function in stroke survivors, which significantly impact their QoL. Its significance lies in advocating for a holistic approach to stroke rehabilitation, ensuring comprehensive care that improves overall well-being. The justification for this study is to provide insights that can inform more effective, patient-centered interventions. Therefore, this study aimed to evaluate the correlation between sexual function, mental health, and QoL among stroke survivors.

MATERIALS AND METHODS

Study design

This was an exploratory cross-sectional study. Eighty-two stroke survivors were recruited. Ethical approval was obtained from the Ethical Review Committee of Nnamdi Azikiwe University, Nnewi Campus. All participants provided informed consent. Patient confidentiality was maintained.

Participants and eligibility criteria

Male and female stroke survivors with hemiplegic or other stroke-related disability who could read, comprehend, and respond were recruited. Patients were excluded based on the following criteria: (1) Patients with health conditions other than stroke. (2) Unmarried stroke survivors. (3) stroke survivors without disability. (4) Stroke survivors with existing sexual dysfunction before stroke.

Variables

Information about the participant's age, sex, and religion were collected. QoL, mental health, and sexual

functions were assessed.

Data collection

The Stroke-specific QoL (SSQOL) questionnaire, International Index of Erectile Function (IIEF-5) questionnaire, Female Sexual Function Index (FSFI), and mental health inventory-38 were used to collect data.

Statistical analysis

Data were analyzed using mean, frequency, and percentages. The correlation of sexual function, mental health, and QoL was done using Spearman rank order, while the influence of sexual function on the QoL of male stroke survivors was analyzed using the Kruskal–Wallis, and comparisons were performed using the Mann–Whitney U test. Statistical significance was set at $P < 0.05$.

RESULTS

Socio-demographic profiles of the participants

Eighty-two stroke survivors with a mean age of 57.91 ± 10.75 years participated in this study. Sixty-one percent of the participants were males, while 89.0% were Christians (Table 1).

QoL, mental health, and sexual functions of the stroke survivors

The mean total QoL score of the participants was 112.57 ± 37.67 , which was 46% of the maximum possible score. The participants had the highest and lowest scores in the vision (68.94%) and social role (24.39%) domains of QoL, respectively. The participants scored $< 50\%$ in seven quality-of-life domains. The mean total mental health score of the participants (141.76 ± 13.70) was 62.7% of the maximum possible score. The participants had the highest and lowest in the anxiety (70.75%) and emotional ties (50.71%) domains of mental health, respectively. The mean total sexual function score (141.76 ± 13.70) of the males was significantly low (30.80% of the maximum possible score). None of the domain scores of the male stroke survivors' sexual function reached the 50th percentile except the overall satisfaction domain, which was 50.61%. The male survivors had worse scores in the intercourse satisfaction domain. Additionally, the mean overall sexual function score (5.91 ± 3.73) of the females was worse than that of males (16.41% of the maximum possible score). None of the domains of the female sexual function reached the 50th percentile, with the participants scoring 0.0% in the pain domain (Table 2).

A significant positive correlation was observed between the QoL and sexual function of the male stroke survivors ($\rho = 0.443$, $P = 0.001$) (Table 3), indicating that a decrease in sexual performance is associated with a significant reduction in their QoL. However, no significant correlation was observed between the mental health and sexual function of the male stroke survivors ($P > 0.05$). The female sexual function had no significant correlation between their QoL or mental health ($P > 0.05$). No significant correlation was observed between mental health and QoL of the stroke survivors ($P > 0.05$) (Table 4).

DISCUSSION

Stroke is a global health challenge with significant implications [15]. Stroke survivors face challenges related to sexual function, mental health, and QoL that warrant thorough investigation and tailored interventions [16]. Therefore, we aimed to understand the correlation between sexual function, mental

health, and QoL in stroke survivors in Nnewi, Nigeria, to inform more effective and holistic approaches to post-stroke care and support. The mean total QoL score for the participants was 112.57 ± 37.67 , which was 46% of the maximum possible score, suggesting a significant impairment in the overall QoL among the stroke survivors.

The participants had varying scores across different domains, with the highest and lowest scores in the vision (68.94%) and social role domains (24.39%), respectively. Participants scored below the 50% mark in seven QoL domains, emphasizing a widespread impact on different aspects of their lives. Stroke has a moderate effect on the QoL of Nigerian survivors [17]. The physical, social, and emotional domains of QoL were affected, with language and vision domains having the least affectation, which is similar to this study where the participant's vision was poorly affected but not in the social role.

The participants were in their fifties and possibly tending towards retirement if not retired and may have achieved their life goals. This could be the reason behind the little affectation of the vision domain compared with social roles. Individuals in this age group (≥ 57 years) are mostly without their children in traditional south-eastern communities because they may have started their own lives, increasing the chance of loneliness and social isolation in this population. Furthermore, among the most common disability following stroke is an affectation of mobility [18].

Furthermore, this study's result is similar to a previous study, which suggested that the overall QoL of stroke survivors was low [19]. A study contrasted this low QoL, where high health-related QoL was recorded after 8 weeks of rehabilitation with a significant increase in muscle strength, emotion, and mobility; however, this was only in comparison between stroke survivors who furthered their rehabilitation treatment and those who did not after inpatient discharge [20]. They suggested that the QoL of life of stroke survivors should be in every clinician's interest from admission, especially regarding social participation restrictions.

Regarding mental health, the mean total score for the participants was 141.76 ± 13.70 , which was 62.7% of the maximum possible score. The highest and lowest scores were observed in the anxiety (70.75%) and emotional ties (50.71%) domains, respectively. While participants exhibited a moderate level of mental health, the variation in scores across domains indicates specific areas of concern, particularly in emotional ties. Studies have shown high rates of anxiety, depression, and other emotional difficulties among stroke survivors, which aligns with the findings of this study. These psychological challenges can further impact the mental well-being and quality of life of survivors ([21]–[23]). Clinicians, including physiotherapists, should pay special attention to survivors of hemorrhagic stroke, as they are at a higher risk of anxiety.

The assessment of sexual function among males revealed a significantly low mean total score of 30.80% of the maximum possible score. None of the domain scores for male stroke survivors reached the 50th percentile, except for overall satisfaction, which reached 50.61%. The lowest scores were observed in the intercourse satisfaction domain, suggesting a significant impact on male survivors' sexual well-being. A similar decline in sexual function was observed in a study [24]. They found a decrease in erection, ejaculation, and orgasm among $< 60\%$ of the males. This highlights the need for targeted interventions to address sexual function issues among male stroke survivors.

For females, the mean overall sexual function score was 16.41% of the maximum possible score (5.91 ± 3.73). None of the domains of female sexual function reached the 50th percentile, with a score of 0.0% in the pain domain. A study reported a $> 70\%$ decrease in libido and coital frequency, indicating a substantial impairment in the sexual function of female stroke survivors, demanding attention to this aspect of their post-stroke care [24]. Males and females faced significant challenges in sexual function, with females exhibiting worse conditions. A previous study observed a greater prevalence of sexual dysfunction among females than males following stroke (95 vs. 75%) [25]. This similarity in these studies could be

attributed to functional decline suffered by both sexes. Physical limitations can play a significant role in developing persistent sexual issues.

Strokes affecting the right-middle cerebral artery can induce hemi-anesthesia and perceptual neglect, where there is an inability to interpret the left side of the environment. These effects may interfere with erotic sensations, complicating the experience of individuals facing such physical impairments. The findings underscore the importance of holistic care and targeted interventions to address the multidimensional impact of stroke on the QoL, mental health, and sexual function of survivors. This study provides valuable insights into the specific domains that require focused attention, guiding future research and intervention strategies in stroke rehabilitation.

A significant positive correlation was observed between the QoL and sexual function of male stroke survivors, implying that as the sexual performance of male stroke survivors decreases, there is a corresponding significant reduction in their overall QoL, which is similar to a previous study [26]. However, no significant correlation was observed between mental health and sexual function among male stroke survivors ($p > 0.05$). This contradicts some previous studies, which suggest a correlation between mental health and sexual function in individuals with chronic health conditions, including stroke survivors ([25], [27]). This may be attributed to the uniqueness of the stroke suffered and how severe it affected this study's participants. Furthermore, no significant correlation was observed between female sexual dysfunction and other variables, suggesting that menopause may play a role since the participants were already in their late fifties and may likely have lost interest in sexual relationships.

The positive correlation between QoL and sexual function in male stroke survivors may be owing to the strong link between sexual health and overall well-being. Sexual satisfaction can boost self-esteem and emotional well-being, which are critical components of QoL. The lack of a similar correlation in females might be influenced by factors such as menopausal status or differing social and cultural attitudes towards sexuality.

No significant difference was observed in the QoL and mental health between males and females. Female stroke survivors have worse QoL than males, which is partly attributable to women's advanced age, more severe strokes, pre-stroke dependency, and post-stroke depression, suggesting targets to reduce the differences [28]. The findings of this study may be because the QoL and mental health outcomes for stroke survivors are primarily influenced by factors such as the severity of the stroke, access to healthcare, rehabilitation efforts, social support, and coping mechanisms rather than sex. If male and female stroke survivors receive similar levels of care, support, and access to resources, no significant difference may be observed in their QoL and mental health outcomes. Stroke affects the brain, which may lead to similar challenges and adjustments for both sexes regardless of biological differences. If we had used an equal number of male and female participants, the results may change, offering a more balanced understanding of sex-specific challenges and potentially revealing different correlations between QoL, mental health, and sexual function.

Finally, the research on sexual function, mental health, and QoL among stroke survivors in Nnewi revealed a significant positive correlation between the QoL and sexual function of male stroke survivors. However, no significant correlation was observed between mental health and sexual function for male stroke survivors. Female sexual function showed no significant correlation with either QoL or mental health. Additionally, no significant correlation was observed between mental health and QoL for male and female stroke survivors. These findings highlight the complex interplay between sexual function, mental health, and QoL in stroke survivors and suggest a need for detailed sexual dysfunction, mental health, and QoL assessment and intervention while paying attention to their physical disability.

CONCLUSIONS

Our findings shed light on the correlation between sexual function, mental health, and QoL among stroke survivors in Nnewi. The positive correlation observed between the QoL and sexual function in male stroke survivors underscores the importance of addressing sexual well-being to enhance overall life satisfaction in this population. However, the lack of significant correlations between mental health and sexual function for both sexes and the absence of correlations for female stroke survivors highlights the need for a further understanding of the factors influencing mental health and QoL. These implications emphasize the necessity for tailored interventions that address the multidimensional aspects of post-stroke care, acknowledging unique experiences and challenges.

ACKNOWLEDGMENTS

The authors thank the patients, staff, and management of the tertiary hospitals in Anambra State, Nigeria where this study was conducted.

FUNDING

None.

COMPETING INTERESTS

The authors declare that they have no competing interests.

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APPENDIX

Table 1. Socio-demographic profiles of the stroke survivors

Variables	Class	Frequency (percentage)	Mean±SD
Age (years)	–	–	57.91±10.75
Sex	Male	50 (61.0)	–
	Female	32 (39.0)	–
Religion	Christianity	73 (89.0)	–
	Islam	1 (1.2)	–
	Others	8 (9.8)	–

Table 2. Quality of life, mental health, and sexual functions of the stroke survivors

Scores	Mean	Mean as percentage of maximum possible score (%)
Quality of life		
Energy	5.40±4.21	36.02
Family roles	4.59±3.03	30.57
Language	16.61±8.85	66.44
Mobility	10.07±6.46	33.58
Mood	16.96±7.86	67.85
Personality	8.20±5.46	54.63
Self care	10.76±7.08	43.02
Social roles	6.10±3.45	24.39
Thinking	8.93±4.70	59.51
Upper extremity function	10.27±6.29	41.07
Vision	10.34±4.90	68.94
Work/productivity	4.35±2.87	29.02
Total quality of life	112.57±37.67	45.95
Mental Health		
Anxiety	38.20±7.96	70.75
Depression	16.84±3.68	73.22
Loss of behaviour or emotional control	38.17±6.18	72.02
General positive effect	37.91±8.07	63.19
Emotional ties	6.09±2.0	50.71
Life satisfaction	4.18±1.62	69.72
Total emotional health	141.76±13.70	62.72
Male sexual function		
Erectile function	2.47±2.41	49.39
Orgasmic function	0.78±1.67	15.51

Sexual desire	1.51±2.33	30.20
Intercourse satisfaction	0.69±1.53	13.88
Overall satisfaction	2.53±1.80	50.61
Total sexual performance	7.70±7.26	30.80
Female sexual function		
Desire	2.06±0.35	34.34
Arousal	0.21±0.74	3.54
Lubrication	0.27±1.07	4.55
Orgasm	0.61±1.75	10.10
Satisfaction	2.82±2.49	46.97
Pain	0.00±0.00	0.00
Total	5.91±3.73	16.41

maximum

Table 3. Spearman rank order correlation testing the relationship between quality of life, mental health, and sexual functions of the stroke survivors

Variable		Quality of life	Mental health
Mental health	Rho=	0.097	–
	P=	0.387	–
Male sexual function	Rho=	0.443	0.108
	P=	0.001	0.457
Female sexual function	Rho=	0.142	-0.322
	P=	0.432	0.068

Table 4. Mann–Whitney U test testing for sex differences in quality of life and mental health of the participants

Variable	sex	Mean rank	U	P
Quality of life	Male	42.54	748.00	0.621
	Female	39.88		
Mental Health	Male	41.20	785.00	0.887
	Female	41.97		