

**IMPACT OF DEPRESSION, FATIGUE, AND ANXIETY ON SLEEP QUALITY AMONG
STROKE SURVIVORS FROM SELECTED GOVERNMENT HOSPITALS IN OSOGBO, OSUN
STATE**

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Received: 19/7/2024; accepted for publication 31/8/2024

ABSTRACT

Background: Stroke is one of the most common diseases that leads to death and varying disabilities. Mood and fatigue levels affect the depth and length of sleep of stroke survivors, leading to sleep disorders which could lead to the recurrence of stroke. Understanding the impact of sleep quality will enhance patient management.

Aim: To determine the impact of depression, anxiety, and fatigue on the sleep quality of stroke survivors.

Method: A cross-sectional design and consecutive sampling technique was used to recruit 50 stroke survivors. The Patient Health Questionnaire-9 was used to determine post-stroke depression, the Fatigue Severity Scale was used to determine post-stroke fatigue, the Generalized Anxiety Disorder-7 was used to determine post-stroke anxiety, and the Pittsburgh Sleep Quality Index was used to evaluate sleep quality. Spearman rank correlation coefficient was used to determine the relationship between these factors.

Result: Post-stroke depression, fatigue, anxiety, and poor sleep quality were observed in 27.4%, 80.4%, 29.4%, and 23.5% of the participants, respectively. A significant relationship was observed between depression, anxiety, and sleep quality.

Conclusion: Poor sleep quality may be a risk factor for depression and anxiety among stroke survivors.

Keywords: *Post-stroke, Depression, Anxiety, Sleep Quality*

INTRODUCTION

The incidence and prevalence of stroke have increased globally by 70% and 102%, respectively.¹ In 2020, approximately 7.08 million deaths were attributed to stroke in the United States.² Africa has the highest incidence and prevalence of stroke, with rates of approximately 316 per 100,000 and 1,460 per 100,000, respectively.³ Nigeria has also seen an increase in stroke incidence to 26.0 per 100,000 and prevalence to 6.7 per 1,000, with a higher ratio in men than women, creating a significant economic burden worldwide.^{4,5}

Stroke survivors have been found to experience a self-perceived burden, impacting their emotional and mental health,⁶ resulting in anxiety and depression, and affecting their quality of sleep.⁷ Sleep quality is determined by restfulness, sufficient and objective sleep depth, time of sleep, and an individual's subjective sleep quality.⁸ Sleep disorders are significantly

associated with factors such as cognitive impairment,⁹ fatigue,¹⁰ anxiety,¹¹ and depression.¹² A systematic review reported a 33% frequency of post-stroke depression impact on sleep quality after 3 months.¹⁰ In contrast, another study revealed that 64.7% of stroke survivors had poor sleep quality.¹³ This burden on stroke survivors, caregivers, society, and the economy creates anxiety, depression, and distress,⁷ impacting their sleep quality and causing delays in recovery.¹⁴ The impact of depression, anxiety, and fatigue on sleep quality has been poorly explored, with sparse data available for referencing in Nigeria. Therefore, this study aimed to determine the impact of depression, anxiety, and fatigue on sleep quality among stroke survivors.

MATERIALS AND METHODS

This was a cross-sectional study. 50 stroke survivors who were >18 years old and were

within 3 months (acute phase of stroke recovery) of experiencing post-ischaemic and haemorrhagic stroke were included in this study and were attending the out-patient units of selected hospitals in Osun state, Nigeria. Stroke survivors with severe aphasia and a decline in cognitive function who were not able to comprehend or interpret questions were excluded from the study. The purpose of the study was explained to both the stroke survivors and their caregivers; consent was sought and obtained before recruitment.

Ethical approval and consent to participate

Ethical approval was obtained from the Redeemer's University Ethics Committee (Directorate of Research Innovation and Partnerships) with Reference number, RUN/REC/2023/030 and Osun State University Ethics Committee with Reference number, UTH/REC/2023/06/09/769. The purpose of the research was explained to the participants and informed consent was obtained.

The Patient Health Questionnaire-9 was used to determine post-stroke depression, the Fatigue Severity Scale was used to determine post-stroke fatigue, Generalized Anxiety Disorder-7 was used to determine post-stroke anxiety, and the Pittsburgh Sleep Quality Index was used to evaluate sleep quality. Spearman's rank

correlation coefficient was used to determine the relationship between post-stroke depression, anxiety, fatigue, and sleep quality.

RESULTS

Forty-five participants (90%) were married, 4 (8%) were widowed, and 1 (2%) was single. The mean age and duration of stroke were 59.42 ± 10.753 and 36.54 ± 31.878 , respectively. Of the 50 participants, 4 (8%) had no formal education, 11 (22%) were primary school graduates, 21 (42%) were secondary school graduates, and 14 (28%) were tertiary school graduates. Of the 50 participants, 14 (27.5%) were depressed, 41 (80.4%) were fatigued, 15 (29.4%) had anxiety, 38 (74.5%) had good sleep quality, and 12 (23.5%) had poor sleep quality (Table 1).

Correlation among post-stroke depression, fatigue, anxiety, and sleep quality

A significant correlation was observed between post-stroke depression ($P < 0.001$), post-stroke anxiety (0.008^*), and sleep quality; however, no significant correlation was observed between post-stroke fatigue ($P = 0.139$) and sleep quality (Table 2).

Table 1. Post-stroke depression, fatigue, anxiety, and sleep quality

Variable	N (%)	Median	Interquartile range
Post-stroke depression			
No depression symptoms	36 (70.6%)	5.0000	8.00
Depression symptoms	14 (27.4%)		
Post-stroke fatigue			
No fatigue	9 (19.6%)	37.0000	22.00
Fatigue	41 (80.4%)		
Post-stroke anxiety			
No anxiety	35 (68.6%)	4.0000	8.00
Anxiety	15 (29.4%)		
Sleep quality			
Good sleep quality	38 (74.5%)	3.0000	3.25
Poor sleep quality	12 (23.5%)		

Table 2. Correlations between post-stroke depression, fatigue, anxiety, and sleep quality

Variable	Sleep quality		r_s	p-value
	Good sleep quality	Poor sleep quality		
Post-stroke depression	8	6	0.450*	0.001
Post-stroke fatigue	32	9	0.212	0.139
Post-stroke anxiety	12	3	0.373*	0.008

DISCUSSION

This study revealed that 27% of stroke survivors experienced post-stroke depression, 80% experienced fatigue, and 29.4% experienced anxiety. However, higher prevalences were recorded in other studies.^{12,15,16,17} These differences may be because of environmental factors, different assessment tools, and sample sizes. This study also found that 23.5% of participants had poor sleep quality, similar to a study reporting a 25% prevalence.¹⁸ However, some studies reported even higher rates of poor sleep quality.^{19,20} The reason for this difference may be because the participants in this study were still in the acute phase of stroke recovery. Most stroke survivors regain strength and cope with their new life conditions after the acute stage.¹⁸ Furthermore, the participants in this study were older and better adapted to life changes and difficulties owing to their experiences.

Significant correlations were observed among post-stroke depression, anxiety, and sleep quality, which is similar to studies that reported sleep quality to be significantly associated with depression and as a precursor to developing anxiety among stroke survivors, resulting in delayed recovery and poor stroke outcomes, worsening disability and reducing quality of life. This study had some limitations, which included the small sample size and the fact that persons with aphasia were excluded. Thus, these results may not apply to all stroke survivors.

CONCLUSION

Persistent poor sleep may result in depression and anxiety which will result in delay in recovery and cause further functional disability among this

population. Managing poor sleep quality will reduce reoccurrence of stroke and also the length of stay in hospitals thereby reducing the physical and emotional burden on the caregivers and can inform updates on stroke care guidelines in Nigeria.

Acknowledgement: The authors acknowledge the efforts of the patients and caregivers who participated in this study.

Funding: This research received no external funding.

Competing interests

The authors declare no conflicts of interest.

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