Quality of life and associated factors among poststroke clinic attendees at a University Teaching Hospital in Nigeria

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ABSTRACT

Background: Quality of life (QOL) measures are effective in quantifying disease burden after stroke, more so than levels of debility. The objective of this study is to determine QOL and associated factors of stroke survivors in Lagos, Nigeria. **Materials and Methods:** Seventy stroke survivors (study sample) and seventy stable hypertensive patients (control sample) attending clinics at a Nigerian hospital were recruited for the study. Respondents were assessed using sociodemographic/clinical questionnaires, modified mini-mental state examination, modified Rankin Scale, schedule for clinical assessment in neuropsychiatry, and World Health Organization-QOL-BREF. **Results:** Mean ages of the study and control respondents were 57.43 (±9.67) years and 57.33 (±9.33) years, respectively. Each sample comprised 38 male and 32 female respondents. Stroke survivors were significantly more likely to: be unemployed ($P = 0.001$), pay more for healthcare ($P = 0.001$), consume alcohol ($P = 0.02$), and have physical impairments ($P = 0.001$) compared with control. The mean QOL scores of stroke survivors were significantly lower than controls across all spheres. Stroke survivors who were unemployed, younger, female, paying more for healthcare, more disabled, with right stroke lateralization, having comorbidities, and sexual dysfunction had significantly poorer QOL specific grades. Depression or anxiety poststroke was also associated with reduced QOL means scores. **Conclusion:** Besides, clinical variables such as levels of disability and stroke lesion lateralization, other factors such as unemployment, health costs, age, gender, and emotional problems influenced QOL after stroke.

Key words: Associated factors, clinic attendees, Nigeria, poststroke, quality of life, University Teaching Hospital

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INTRODUCTION

Stroke is a leading cause of death and neurological disability in adults, inflicting a heavy burden on affected individuals and their families.[1] Stroke studies currently indicate that the disorder is assuming a significant dimension among noncommunicable diseases in developing countries.[2] The burden prolonged hospitalization has on informal caregivers, economic implications of treatment costs, and losses in productivity has been previously explored.[3]

The World Health Organization (WHO) defines quality of life (QOL) as individual perceptions of their position in life in the context of the culture and value systems, in which they live and also in relation to their goals, expectations, standards, and concerns. It is a broad ranging concept affected in a complex way by physical health, psychological state, level of independence, personal benefits, and their relationship to salient features of the environment an individual resides.[4] When specifically related to health, it is

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referred to as health-related QOL (HRQOL) because there are wide valued aspects of life not generally considered as "health." HRQOL refers to the ways in which health, illness, and medical treatment influence individual perceptions of functioning and well-being.[5] HRQOL measures are important in quantifying disease burden and evaluating the effects of therapies.[6]

Stroke is often catastrophic and affects most aspects of its survivor's life. Unlike other chronic disabling illnesses, the onset of stroke is sudden, leaving survivors and family ill prepared to deal with its sequele.[7] Evaluating QOL poststroke often reveals a condition with multilayered impact,[8] affecting even survivors with mild consequences of stroke and those who have achieved full independence in activities of daily living.[9] Results from different studies show that emotional disorders,[6] gender,[9] and other demographic/clinical variables,[6,9] negatively impact QOL post stroke. Individual QOL domains have also been reported to be affected in varying degrees among stroke survivors in different populations.[10]

There is a dearth of studies focusing on QOL among chronically ill patients in Africa generally and Nigeria in particular. Research in the aforementioned area would help guide policy formulation and qualitative treatment of people with chronic illnesses including stroke. This study looks at the QOL and associated factors of stroke survivors attending outpatient clinics at a Nigeria hospital.

MATERIALS AND METHODS

This study was comparative and cross-sectional in design. Data collection was completed in 5 months (October 2013–February 2014). A total of 70 stroke survivors with an equal number of controls made up of individuals with controlled hypertension were recruited for the study. The study was carried out at the Lagos University Teaching Hospital, Lagos, Nigeria. Data of the study sample were collected consecutively from adult stroke survivors attending neurology and physiotherapy outpatient clinics while data of the control sample were consecutively collected from adult patients with a history of hypertension (and no other chronic medical problems) who have had stable blood pressure for at least 3 months prior to data collection and attending the general outpatient department clinic. Adjustments with matching for age and sex were considered before recruitment of the control sample (±2 years and same sex).

Ethical approval was obtained from the Health Research and Ethics Committee of the hospital before commencement of the study. Purpose of study, study procedure, expected duration of involvement, or whether any risk was involved was explained to participants. Other issues such as confidentiality and voluntariness regarding participation were also explained.

After obtaining written consent, stroke survivors were administered: Sociodemographic/clinical questionnaires designed by the authors, modified mini-mental state examination[11] (to assess degree of cognitive deficits), and modified Rankin scale[12,13] (to assess severity of stroke debility). Stroke survivors with severe cognitive deficits or having other chronic and severely debilitating medical conditions were excluded from the study. Stroke survivors were subsequently administered the Schedule for Clinical Assessment in Neuropsychiatry (SCAN) which evaluates, classifies and measures psychopathology and behavior in adults.[14]

The SCAN examination involves comparing the described subjective experience of respondents elicited by the interviewer against glossary description of clinical phenomenon.[14] The elicited phenomena are then used to generate clinical diagnoses as described in the international classifications of diseases, tenth edition (ICD-10) through data imputed into the SCAN algorithm computer software.[14] The SCAN was used in our study to diagnose emotional distress in the form of depression or anxiety disorders in stroke survivors. Finally WHOQOL BREF[15] questionnaire, a 26-item self-administered instrument that measures health-related quality of life with emphasis on subjective responses in the preceding two weeks was administered to stroke survivors. Controls were however administered: Sociodemographic/clinical questionnaires and the WHO QOL-BREF.[15]

The WHO QOL-BREF consists of six spheres which include two general categories of overall health and health satisfaction and four specific domains of physical, psychological, social, and environmental health. The range of each sphere of QOL is from 0 to 100; poor QOL is indicated by numbers pointing to "0" and high quality is characterized by numbers pointing to "100."[16] Since scores for each QOL sphere follow a normal distribution, categorization was done around the value of the mean ± 1 standard deviation (SD), with "good" representing values greater than the mean plus one standard deviation (>+1SD); "moderate/fair" representing values equal to the mean plus or minus one standard deviation (=±1SD); and "poor" representing values less than the mean minus one standard deviation (<−1SD).[17]

All data collected were coded and entered into the computer for analysis. Data was analyzed using the Statistical Package for Social Sciences (SPSS) version 17.0 by SPSS Inc., 233 South Wacker Drive, 11th floor, Chicago, IL. USA.[18] Means, frequencies, and percentages were used to analyze data. Independent *t*-test was used to test for significance between numerical variables. Chi-square tests were used to test for significance between nominal variables when the minimal expected cell count was 1 and where at least 80% of the cells had expected values of 5 and above.[19] The Fischer's exact test was used when the

criteria for Chi-square was not met.[20] A confidence interval of 95% was used which allows for 5% sampling error at significance of ≤0.05.

RESULTS

Table 1 shows comparisons of sociodemographic/clinical variables in the study and control respondents. A total of seventy study and seventy control respondents were recruited. The mean age of the study group was 57.43 (±9.67) years while that of the control group was 57.33 (±9.33) years, and the difference was not significant ($P = 0.95$) indicating adequate age matching. Furthermore, both study and control groups had 38 (54.3%) male respondents and 32 (45.7%) female respondents. Stroke survivors were significantly ($P = 0.001$) more likely to be unemployed 28 (40.0%) compared to controls 3 (4.2%) and also significantly ($P = 0.001$) more likely to pay more than ₦10,000 a month for healthcare 34 (45.7%) compared to controls 5 (7.1%). Stroke survivors were also more likely to currently consume alcohol 13 (18.6%), have sexual dysfunction 16 (22.9%) and have sensory impairments 60 (85.7%) compared to controls 3 (4.3%), 4 (5.7%), and 7 (10.0%), respectively. The aforementioned differences were statistically significant ($P = 0.02$, $P = 0.001$, $P = 0.001$, respectively).

Table 2 shows comparisons of mean QOL scores in the study and control samples. In the study sample, the QOL sphere with the highest mean score was overall health 59.43 (±14.83) similar to control with however a significantly higher (P 0.001) mean score 74.57 (±10.17). The physical health domain had the lowest mean score 50.56 (±12.63) among the QOL spheres in the study sample; however, the environmental health domain had the lowest 54.71 (±9.25) mean scores in the control sample. Comparing mean QOL scores in specific spheres indicates that stroke survivors had significantly lower scores in all categories when compared with control. Overall health, health satisfaction, physical, psychological, and social health domains comparisons, all had $P = 0.001$ levels of significance. The environmental health domain however showed $P = 0.02$ level of statistical significance (set level of significance being ≤0.05) when study and control sample mean QOL scores were compared.

Table 3 shows comparisons of statistically significant sociodemographic variables and QOL grades in stroke survivors. Stroke survivors with poorer overall health QOL grades were significantly more likely to be female 14 (43.8%) and paying more than ₦10,000 a month 14 (41.1%) for health care ($P = 0.03$, $P = 0.01$, respectively). Stroke survivors with poorer QOL psychological health were significantly ($P = 0.02$) more likely to be a younger. Furthermore, stroke survivors who were unemployed were significantly more likely to have poorer QOL in the

Table 1: Sociodemographic/clinical variables in study and control samples

Parameter	Study	Control	Test
Mean age (years) (±SD)	57.43 (±9.67)	57.33 (±9.33)	t=0.062 P=0.95 CI=−3.08-3.28
Gender (%)			
Male	38 (54.3)	38 (54.3)	χ²=0.000
Female	32 (45.7)	32 (45.7)	P>0.99
Marital status (%)			
Married	56 (80.0)	53 (75.7)	χ²=0.373
Unmarried	14 (20.0)	17 (24.3)	P=0.68
Educational level (%)			
Secondary or less	41 (58.6)	34 (48.6)	χ²=1.407
Tertiary	29 (41.4)	36 (51.4)	P=0.31
Employment status (%)			
Employed	22 (31.4)	44 (62.9)	χ²=27.310
Retired	20 (28.6)	23 (32.9)	P<0.001*
Unemployed	28 (40.0)	3 (4.2)	
Monthly health bill (₦) (%)			
<10,000	36 (54.3)	65 (92.9)	χ²=30.00
>10,000	34 (45.7)	5 (7.1)	P<0.001*
Current alcohol use (%)			
Yes	13 (18.6)	3 (4.3)	χ²=7.056
No	57 (81.4)	67 (95.7)	P=0.02*
Sexual dysfunction (%)			
Yes	16 (22.9)	4 (5.7)	χ²=8.400
No	54 (77.1)	66 (94.3)	P = 0.003*
Sensory impairment (%)			
Yes	60 (85.7)	7 (10.0)	χ²=80.41
No	10 (14.3)	63 (90.0)	P<0.001*
Total	70 (100)	70 (100)	

χ² – Chi-square; P – Level of significance; SD – Standard deviation; ₦ – Naira currency; t – Independent t-test; CI – Confidence interval, *– Statistically significant

Table 2: Mean quality of life scores in study and control samples

Mean quality of life score (±SD)	Study	Control	Test
Overall health	59.43 (±14.83)	74.57 (±10.17)	t=7.343 P<0.01* CI=−19.59-−11.27
Health satisfaction	51.14 (±16.90)	65.14 (±15.86)	t=5.054 P<0.01* CI=−19.46-−8.52
Domain 1 (physical health)	50.56 (±12.63)	65.10 (±8.64)	t=7.952 P<0.01* CI=−18.16-−10.93
Domain 2 (psychological health)	51.41 (±12.79)	62.51 (±10.31)	t=5.655 P<0.01* CI=−14.98-−7.22
Domain 3 (social health)	56.30 (±13.11)	63.77 (±11.72)	t=3.555 P<0.01* CI=−11.63-−3.32
Domain 4 (environmental health)	50.87 (±10.15)	54.71 (±9.25)	t=2.341 P=0.02* CI=−7.09-−0.60

χ² – Chi-square; P – Level of significance; SD – Standard deviation; t – Independent t-test; CI – Confidence interval; *– Statistically significant

spheres of: Health satisfaction 6 (21.4%), physical health 14 (50.0%), psychological health 9 (32.2%), and social

Table 3: Comparison of statistically significant sociodemographic variables and quality of life grades in stroke survivors

Parameter	Quality of life grade			Test
	Good (>+1 SD)	Fair (=±1 SD)	Poor (<−1 SD)	
Overall health	*n*=18 (25.7)	*n*=32 (45.7)	*n*=20 (28.6)	
Gender				
Male	10 (26.3)	22 (57.9)	6 (15.8)	χ^2=7.463
Female	8 (24.9)	10 (31.3)	14 (43.8)	*P*=0.03*
Monthly health bill (₦)				
<10,000	14 (38.9)	16 (44.4)	6 (16.7)	χ^2=8.706
>10.000	4 (11.8)	16 (47.1)	14 (41.1)	*P*=0.01*
Health satisfaction	*n*=8 (11.4)	*n*=54 (82.9)	*n*=8 (11.4)	
Employment				
Employed	5 (22.7)	15 (68.2)	2 (9.1)	χ^{2*}=8.785
Retired	2 (10.0)	18 (90.0)	0 (0.0)	*P*=0.03*
Unemployed	1 (3.6)	21 (75.0)	6 (21.4)	
Physical health	*n*=18 (25.7)	*n*=34 (48.6)	*n*=18 (25.7)	
Employment				
Employed	10 (45.5)	9 (40.9)	3 (13.6)	χ^{2*}=18.250
Retired	5 (25.0)	14 (70.0)	1 (5.0)	*P*<0.01*
Unemployed	3 (10.7)	11 (39.3)	14 (50.0)	
Psychological health	*n*=13 (18.6)	*n*=46 (65.7)	*n*=11 (15.7)	
Mean age	64.23 (±9.39)	56.0 (±9.14)	55.09 (±9.43)	*F*=4.386 *P*=0.02*
Employment				
Employed	4 (18.2)	17 (77.3)	1 (4.5)	χ^{2*}=9.846
Retired	6 (30.0)	13 (65.0)	1 (5.0)	*P*=0.04*
Unemployed	3 (10.7)	16 (57.1)	9 (32.2)	
Social health	*n*=25 (35.7)	*n*=38 (54.3)	*n*=7 (10.0)	
Employment				
Employed	9 (40.9)	10 (45.5)	3 (13.6)	χ^{2*}=9.300
Retired	11 (55.0)	9 (45.0)	0 (0.0)	*P*=0.04*
Unemployed	5 (17.9)	19 (67.9)	4 (14.2)	

χ^2 – Chi-square; χ^{2*} – Fischer's exact; *P* – Level of significance; SD – Standard deviation; ₦ – Naira currency; CI – Confidence interval; *– Statistically significant

health 4 (14.2%) (*P* = 0.03, *P* = 0.001, *P* = 0.04, *P* = 0.04, respectively).

Table 4 shows comparisons of statistically significant clinical variables and QOL grades in the study respondents. Stroke survivors with poorer QOL overall health grades were significantly (*P* = 0.001) more likely to have suffered right hemispheric strokes 17 (47.0%). Stroke survivors with poorer QOL health satisfaction grades were however significantly (*P* = 0.001) more likely to have comorbidities 7 (13.0%). Furthermore, stroke survivors with poorer QOL psychological health were significantly (*P* = 0.001) more likely to have suffered more recent strokes of less than a year duration 8 (28.6%). Stroke survivors with poorer QOL social health domain grades were found to significantly (*P* = 0.03) have sexual dysfunction poststroke 5 (31.3%) as assessed by data from sociodemographic/ clinical questionnaires designed by the authors. Finally, stroke survivors with moderate-severe poststroke debility were significantly more likely to have poorer QOL grades in the: Overall health 5 (83.3%), health satisfaction 4 (66.7%), physical health 4 (66.7%), and psychological

health 4 (66.7%) spheres (*P* = 0.001, *P* = 0.001, *P* = 0.001, *P* = 0.001, respectively).

Table 5 shows comparisons of mean QOL scores with diagnoses of depression or anxiety in stroke survivors. Respondents with diagnoses of depression or anxiety disorders had significantly lower mean QOL scores (*P* = 0.001, *P* = 0.001, *P* = 0.001, *P* = 0.001, *P* = 0.014, *P* = 0.024) than those without such disorders across the overall, health satisfaction, physical, psychological, social, and environmental spheres, respectively.

DISCUSSION

QOL measures provide a broader description of the impact of illness on various aspects of an individual's life rather than just level of debility. There is a paucity of West African studies on QOL poststroke, but research interest in this area is growing. This study hopes to fill the existing gaps in policy and improve all-round management of stroke survivors where the current emphasis of care is restricted mostly to blood pressure control and rehabilitation through physiotherapy.

Table 4: Comparison of statistically significant clinical variables and quality of life grades in stroke survivors

Parameter	Quality of life grade			Test
	Good (>+1 SD)	Fair (=±1 SD)	Poor (<−1 SD)	
Overall health	n=18 (100)	n=32 (100)	n=20 (100)	
Stroke lateralization				
Right hemispheric	9 (24.3)	11 (28.7)	17 (47.0)	χ^2*=18.978
Left hemispheric	7 (24.1)	19 (65.5)	3 (10.4)	P<0.01*
Brain stem/posterior lobe	2 (50.0)	2 (50.0)	0	
Modified ranking score				
No significant disability	11 (84.6)	1 (7.7)	1 (7.7)	χ^2*=35.321
Slight disability	4 (12.9)	22 (71.0)	5 (16.1)	P<0.01*
Moderate disability	3 (15.0)	8 (40.0)	9 (45.0)	
Moderate severe disability	0	1 (16.7)	5 (83.3)	
Health satisfaction	n=8 (11.4)	n=54 (82.9)	n=8 (11.4)	
Comorbidity				
No	3 (100.0)	0	0	χ^2*=13.254
Hypertension	5 (9.3)	42 (77.0)	7 (13.0)	P<0.01*
Hypertension + diabetes	0	12 (82.3)	1 (7.7)	
Modified ranking score				
No significant disability	7 (53.8)	6 (46.2)	0	χ^2*=32.005
Slight disability	1 (3.2)	28 (90.3)	2 (6.5)	P<0.01*
Moderate disability	0	18 (90.0)	2 (10.0)	
Moderate-severe disability	0	2 (33.3)	4 (66.7)	
Physical health	n=18 (25.7)	n=34 (48.6)	n=18 (25.7)	
Modified ranking score				
No significant disability	11 (84.6)	1 (7.7)	1 (7.7)	χ^2*=31.851
Slight disability	6 (18.4)	20 (64.5)	5 (16.1)	P<0.01*
Moderate disability	1 (5.0)	11 (55.0)	8 (40.0)	
Moderate severe disability	0	2 (33.3)	4 (66.7)	
Psychological health	n=13 (18.6)	n=46 (65.7)	n=11 (15.7)	
Stroke duration (years)				
<1	1 (3.6)	19 (67.8)	8 (28.6)	χ^2*=14.04
1-2	5 (55.6)	4 (44.4)	0	P<0.01
>2	7 (21.2)	23 (69.7)	3 (8.1)	
Modified ranking score				
No significant disability	6 (46.2)	7 (53.8)	0	χ^2*=24.431
				P<0.01
Slight disability	6 (18.4)	24 (77.4)	1 (3.2)	
Moderate disability	1 (5.0)	13 (65.0)	6 (30.0)	
Moderate severe disability	0	2 (33.3)	4 (66.7)	
Social health	n=25 (35.7)	n=38 (54.3)	n=7 (10.0)	
Sexual dysfunction				
Yes	2 (12.4)	9 (56.3)	5 (31.3)	χ^2*=10.820
No	23 (42.6)	29 (53.7)	2 (3.7)	P=0.03*

χ^2* – Fischer's exact; *P* – Level of significance; SD – Standard deviation; *– Statistically significant

In the current study, the mean age of stroke survivors was 57.43 (±9.67) years. This value is similar to the findings of other studies reviewed on stroke survivors in Nigerian tertiary hospitals. The mean ages across studies reviewed ranged from 53 (±14.3) years to 68 (±12) years.[1-3,21-23] Recent studies have shown that stroke is occurring increasingly among younger people, particularly in urban areas.[21,24,25] The aforementioned is probably due to greater tendencies for a more sedentary lifestyle and adoption of diets predisposing them to stroke risk factors such as hypertension and obesity.

Stroke was traditionally a condition primarily seen in men, but this gender gap is narrowing. This present study had a male to female ratio of 1.2:1 showing a slight male preponderance. Other studies have shown wider male/female ratio disparity of up to 2:1.[26] Nigerian community household surveys also indicate higher prevalence of stroke in men.[27,28]

A greater percentage of stroke survivors were unemployed compared to control. Despite the aforementioned, a significant proportion of stroke survivors paid more

Table 5: Comparison of mean quality of life scores with diagnoses of depression and anxiety disorders in stroke survivors

WHOQOL mean score (±SD)	No disorder (anxiety or depression), *n*=47 (100)	Depression, *n*=16 (100)	Anxiety, *n*=7 (100)	Test
Overall health score	63.83 (±14.23)	51.25 (±12.58)	48.57 (±10.69)	*F*=7.598 *P*<0.01* CI=55.89-62.96
Health satisfaction	57.02 (±15.02)	40.00 (±12.65)	37.14 (±17.99)	*F*=11.335 *P*<0.01* CI=47.11-55.17
Physical health domain	55.43 (±11.06)	41.19 (±9.827)	39.29 (±9.41)	*F*=15.019 *P*<0.01* CI=47.55-53.57
Psychological health domain	55.98 (±10.21)	41.75 (±12.64)	42.86 (±13.59)	*F*=12.057 *P*<0.01* CI=48.37-54.46
Social health domain	59.40 (±13.17)	50.75 (±8.17)	48.14 (±15.64)	*F*=4.525 *P*<0.01* CI=53.17-59.43
Environmental health domain	53.11 (±9.27)	47.13 (±10.97)	44.43 (±10.08)	*F*=3.948 *P*=0.02* CI=48.45-53.29

F – Three-way ANOVA; *P* – Level of significance; SD – Standard deviation; CI – Confidence interval; *– Statistically significance, WHOQOL – World Health Organization Quality of Life

monthly for healthcare. The rate of unemployment among stroke survivors (40%) was much higher than the estimated 23.9% unemployment rate in Nigeria.[29] Considering the mean age of stroke survivors in the current study, they were probably still in their productive years and may have been breadwinners of their families. These aforementioned findings agree with Baumann *et al.*,[30] who reported two-third of the respondents being employed before stroke; however, afterward, more than half became unemployed or had to retire with 46% eventually having substantially reduced incomes.

In the study, a higher proportion of stroke survivors consumed alcoholic beverages compared with control, and the difference was statistically significant. This is in agreement with findings of other studies reviewed indicating substantial alcohol use among stroke survivors.[2,25] These findings suggest alcohol use to still be a significant modifiable risk factor for stroke.

The mean scores in all six QOL spheres were significantly lower in stroke survivors compared with control. This is in agreement with studies reviewed.[31-33] In this study, stroke survivors had higher mean overall health scores compared with other QOL spheres. This is in agreement with Akosile *et al.*[10] and Owolabi *et al.*,[34] who also found fairly high QOL overall health scores in stroke survivors and both authors also suggested that acquired coping strategies may in the long-term minimize the effect of stroke on this QOL sphere. Wright[35] found that with time, coping strategies such as enlarging the scope of values contribute positively to the meaning of life with a disability. The QOL physical health domain mean score of stroke survivors was the lowest in this study compared with other QOL spheres.

This replicates the findings of Akosile *et al.*[10] and Owolabi *et al.*,[33] who argued that the physical sphere will probably be the first QOL domain affected by stroke. This is probably due to the sudden and often unexpected nature of stroke producing a sequele of physical debilities more so at the acute phase of the illness.

In the current study, female stroke survivors had significantly poorer QOL overall health grades. This finding is in agreement with other previous studies reviewed.[9,36-40] Factors such as increased poverty, reduced social support, and increased presence of comorbidities such as depression in women are possible explanations. This finding was however not replicated in other studies reviewed.[6,10,41,42] Jönsson *et al.*[43] even found better QOL in female stroke survivors. Adjustments in methodology for factors such as prevalence rates for depression, different gender roles in activities of daily living, disparities in income, and social support may be necessary before valid conclusions can be made.

Statistical significance was recorded in the current study suggesting younger stroke survivors were more likely to have poorer QOL psychological domain grades. An increasing number of stroke survivors in Nigeria are getting younger. Owolabi and Ibrahim[44] in a study found more than a quarter of stroke survivors aged 40 years and below. Although there have been inconsistencies in studies reviewed between age and QOL domain scores, King[45] found a significant association between younger age at stroke onset and worsening QOL scores in socioeconomic domains of the QOL instrument used. The findings in this current study may not be out of place in that significance was recorded between unemployment and poor QOL

psychological domain grade. Younger stroke survivors who should rather be employed (compared with older respondents that may otherwise have retired before stroke) but have been made redundant may be affected more significantly by poor psychological health.

In this study, being unemployed was significantly associated with poorer QOL in health satisfaction, physical, psychological, and social health domain grades. This result is not surprising as unemployment would affect socioeconomic status. In Nigeria where scarcely any social health benefit exists, reduced income subsequent to unemployment poststroke would predictably affect most QOL spheres. This aforementioned finding replicates other studies reviewed,[30,31,46] where unemployment was also significantly associated with reduced QOL poststroke. Similarly, in the current study, stroke survivors paying more for healthcare were also significantly more likely to have poor overall health grades. This possibly indicates frustrations with out-of-pocket health care payments despite dwindling financial resources.

Right hemispheric strokes were significantly associated with poorer QOL overall health grades in the current study. More than half of the study respondents had right hemispheric strokes with all being right-handed. There have been inconsistencies across studies reviewed regarding lesion lateralization and QOL. Gbiri and Akinpelu.[46] found significant associations between right hemispheric strokes and poorer QOL. de Haan *et al*.[47] also found that except for problems in communication resulting in poorer QOL, the QOL of stroke survivors with left sided strokes was better than those with right sided strokes. Neurological deficits such as hemineglect, spatial disorientation, and lack of awareness of illness will probably impacted more negatively on poststroke rehabilitation and hence QOL.

The presence of hypertension and diabetes comorbidity in stroke survivors was significantly associated with poorer health satisfaction grades in the current study. This is despite the fact that stroke survivors with severe cognitive impairments and other chronic debilitating medical conditions were excluded from the study. This finding is however in agreement with Gokkaya *et al*.[32] and Suenkeler *et al*.,[48] who also reported stroke survivors with multiple comorbidities having poorer QOL. Besides higher degrees of functional impairment associated with multiple comorbidities, other factors such as increased pill load and the inconvenience of keeping multiple clinic appointments may be responsible for the aforementioned findings.

In the current study, stroke survivors interviewed within 12 months poststroke were more likely to have poorer psychological health domain grades. There have been inconsistencies across studies with regard to QOL and poststroke duration; however, some studies reviewed agreed with the aforementioned findings.[49,50] Gbiri *et al*.[46]

also found QOL in stroke survivors to be low at onset, improve steadily to 6 months and little between 6 and 12 months. Suenkeler *et al*.,[48] however, recorded a gradual deterioration in most QOL domains with time. The aforementioned finding of this current study may indicate peak periods of optimal functional improvement and adoptions of coping strategies reducing the negative impact stroke might have on QOL. More studies need to be done in this regard.

Stroke survivors in the current study with sexual dysfunction were more likely to report poor QOL social domain grades. This finding is in agreement with King,[45] recording significantly low quality of sexual life and satisfaction after stroke. It is worthy of note that the mean age of stroke survivors in the current study is 57 years and a majority were married. Consequent to stroke, survivors may be weary to carry out or request for sex from partners who may also be unwilling to oblige due to fears of precipitating another stroke in their spouses.

In the current study, stroke survivors with higher degrees of functional disability had significantly poorer QOL grades across most spheres, except the environmental and social health QOL domains. A great number of studies reviewed found independent significant associations between degree of functional impairment and worsening QOL.[6,9,38,41,43,45,51] Studies by Samsa and Matchar[52] and Lai *et al*.[53] however found only weak or no relationship, respectively, between functional disability and QOL after stroke. The findings of these two aforementioned studies may indicate that heterogeneous factors rather than just only worse levels of functional disability negatively affect QOL post stroke. Further research is warranted.

Psychiatric morbidity is a recognized cofounder in QOL measures among persons with chronic disorders such as stroke.[54] In the current study, the presence of depression and anxiety disorders was associated with significantly lower mean scores and poorer grades in all QOL spheres. These findings replicate most of the studies reviewed indicating the presence of depression of any severity as being independent predictors of poor QOL in stroke survivors.[6,9,32,38,43,46,48,50] There is a paucity of studies that looked at associations between poststroke anxiety and QOL from our review. Tang *et al*.[55] however found that anxiety had a negative effect on the QOL of stroke survivors independent of depression.

Limitations
The cross-sectional design of the study limits inferences that can be made about the trajectory of variables measured in stroke survivors over time. However, its comparative case/control design enables measured inferences to be made. The wide range of stroke durations at interview and the exclusion of stroke survivors with more severe cognitive impairments and other severe comorbidities may affect

generalizability of findings. This is however pragmatic due to the nature of diagnostic instruments administered. This aforementioned design also excludes the use of proxy responses to questionnaires. A stroke-specific QOL measure might have been used rather than a generic measure, but this would have made QOL comparisons between study and control samples problematic. The small sample recruited and the hospital-based nature of the study also limits generalizations inferable from the study.

CONCLUSION

Our study found that stroke survivors were significantly more likely to have economic challenges of unemployment and higher health care costs compared with control. We also found that alcohol use was still a significant risk factor towards developing stroke. These findings we hope will help governments particularly in developing countries improve social schemes to reduce out of pocket healthcare payment and improve health care promotion particularly on the dangers of heavy alcohol consumption by at risk groups for stroke. Our study also found that stroke survivors had significantly poorer QOL compared to control. Furthermore our study found that certain clinico-demographic factors including the presence of emotional disorders in the form anxiety and depression were significant identifiable association for poor QOL post stroke. Hence healthcare professionals should note that detection of these risk factors should be an integral part of post stroke management for better clinical outcomes.

Conflicts of interest
There are no conflicts of interest.

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