

Title: Quality of Life of Stroke Survivors in Africa: A Systematic Review and Meta-analysis

Running title: Quality of life of African Stroke Survivors

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ABSTRACT

Purpose: Functional impairments and socioeconomic constraints associated with stroke affect quality of life (QoL). With limited care and social support resources, there is a greater anticipated decline in QoL among stroke survivors in Africa. This study aims to examine post-stroke QoL, properties of outcome measures adopted and predictors of the QoL among African stroke survivors.

Methods: African Journals Online, CINAHL, PsychINFO, PubMed and Web of Science databases were searched from inception to February 2020. Methodological quality was assessed using the Agency for Healthcare Research and Quality (ARHQ) methodology checklist for observational studies.

Results: Twenty-eight studies recruiting 2572 (76.4%) stroke survivors and 795 (23.6%) healthy volunteers were included. Studies were conducted in eight African countries between 2007 and 2019. Methodological quality of studies was good. Overall, stroke survivors reported low QoL. Six studies comparing QoL between stroke survivors and healthy controls were pooled for meta-analysis. Results showed a biased-adjusted standardised mean difference (Hedges's g) of 1.13 (95% CI 0.71 to 1.56; $p < 0.001$), indicating better QoL among healthy controls. Only 4 (14.3%) studies used translated or cross-culturally adapted QoL assessment tools. The most commonly reported predictor of QoL was post-stroke disability (35.8% of studies), which is followed by depression (28.6%) and stroke severity (28.6%).

Conclusions: Overall, African stroke survivors reported comparatively lower QoL as compared to age-matched healthy controls. This highlights the need for cross-culturally validated assessment tools and more robust post-stroke QoL evaluation across the African continent. To improve QoL of stroke survivors in Africa, early interventions should focus on reducing disability and depression associated with stroke.

Keywords: Stroke survivors; Quality of life; Predictors; Africa; Cross-cultural

PROSPERO registration number: CRD42019137653

INTRODUCTION

A 20% increase in overall stroke prevalence among low- and middle-income countries relative to high-income countries was recorded for the first time between 2000 and 2008.[1] In Africa, the annual number of new stroke cases increased by 10.8% from 2009 to 2013,[2] indicating a steady rise of stroke cases in the continent. Stroke is a major cause of mortality and reduced disability-adjusted life years [3,4]. Weakness or paralysis of the involved side is a common sequela, occurring in about 50% of cases with associated upper and lower extremity paresis [5]. Decreased quality of life (QoL) and concomitant declines in daily physical activity are also commonly reported [6]. Stroke-related burden is high in low-middle income countries where medical care and social support resources are limited [1].

The indicators for improvement following care for stroke include but not limited to QoL, functional assessment and muscle performance [7]. QoL has been used as a crucial indicator for examining the efficacy of stroke rehabilitation for over 3 decades [6]. QoL is a multifactorial construct covering subjective perception of the physical, psychological, social and environmental domains [8]. Although several studies have reported the effect of stroke on the different QoL domains among African stroke survivors [9-11], the findings and possible implications of these studies are limited by small sample sizes and methodological discrepancies. Moreover, a recently published narrative review of QoL determinants among African stroke survivors reported reductions in QoL across the physical, social and emotional domains [12]. However, the review search strategy was not systematic, and the findings had limited generalisability (i.e. only Nigerian studies). Furthermore, a quantitative comparison between QoL estimates among stroke survivors and healthy controls and an in-depth analysis of the assessment tools used were not undertaken. Therefore, the aims of this systematic review are (1) to examine the QoL of stroke survivors throughout Africa, (2) to assess all measurement properties and review the cross-cultural adaptability of the measures used to assess QoL, and (3) to examine the clinical and anthropometric predictors of QoL among African stroke survivors.

METHODS

Articles search strategy

The Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) [13] guided the methodology and reporting of findings of this systematic review. Prior to commencement, the study protocol was registered with PROSPERO (CRD42019137653). We searched the African Journal Online, CINAHL, PsychINFO, PubMed and Web of Science databases by using pertinent keywords until February 2020. Search themes 'Stroke', 'Quality of life' and 'Africa' were combined using the Boolean operator 'OR' and then

combined using the Boolean 'AND' (See supplementary file 1 for the search strategy adopted in the CINAHL database). The names of all the African countries were listed under the search theme 'Africa' and then combined using the Boolean 'OR' to ensure wide coverage of studies published within Africa. Studies generated through the search process were exported to a citation management software (ENDNOTE X9, Clarivate Analytics, Philadelphia, Pennsylvania, USA). Duplicates were removed, and the identified studies underwent screening of title, abstract and full text. We included studies if they (1) assessed QoL among stroke survivors with or without healthy controls in African settings; (2) assessed QoL using interviews, focus groups and/or questionnaires; (3) were published in English language and (4) were available in full text. Studies were excluded if they were (1) systematic reviews, (2) review protocols or (3) conference abstracts.

Articles screening and data extraction

The included studies were screened independently. Two of the authors (MC and UMB) conducted the search, title screening and duplicate removal. BAT and AG screened the abstracts and full text. Discrepancies during the screening processes were resolved by further discussions and clarifications among the authors. Two of the authors (SIA and AAJ) extracted relevant data from the included studies, including title, country of origin, objective(s), participants' characteristics, location of data collection, QoL assessment tool, major findings and conclusions.

Data synthesis and analysis

Authors DS, MC and UMB synthesised the extracted data. Findings were first narratively synthesised due to considerable heterogeneity among the included studies. The narrative synthesis was conducted in line with the study objectives, as recommended by the Centre for Reviews and Dissemination [14], and involved qualitative and quantitative findings regarding the use of stroke-specific and generic QoL assessments. Findings with sufficient data were pooled for meta-analysis. The meta-analysis was conducted with Comprehensive Meta-analysis software (CMA version 3.0, Biostat Inc., Englewood, New Jersey, USA) by using the biased-adjusted standardised mean difference (Hedges's *g*).

Quality appraisal of the included studies

The Agency for Healthcare Research and Quality (ARHQ) checklist for observational studies [15] was used to assess the methodological quality of the included studies. Two authors (SIA and AAJ) independently conducted the methodological quality assessment. The assessment criteria were adapted from a study by Kaptein et al. [15]. The quality assessment encompassed QoL information sources, study eligibility criteria, participant recruitment and analyses performed. High overall scores in ARHQ indicate high methodological quality.

Scores ≥ 6 points are regarded as good, whereas < 6 points signify poor quality. Details on reporting and imputation of missing data were not assessed because the majority of studies used a cross-sectional survey method.

RESULTS

Electronic and manual search results

We included 19 studies for this review among the identified 253. Figure 1 illustrates the flow of screening process with the criteria for exclusion. The reference lists of the included studies were manually searched to retrieve nine additional studies. Therefore, a total of 28 studies were included, out of which six were eligible for meta-analysis.

Characteristics of the included studies and participants

Among the included studies, 20 were conducted in Nigeria, two were conducted in South Africa and one study each in Ghana, Malawi, Tanzania, Egypt, Kenya and Tunisia. The studies were conducted between 2007 and 2019, of which 27 studies (96.4%) were hospital-based and only 1 (3.6%) was carried out in a hospital and community setting. Six studies included healthy controls in addition to stroke patients, whereas the remaining 22 studies only focused on stroke survivors. A summary of study characteristics is presented in Table 1. The included studies recruited 3367 participants, of which 2572 (76.4%) were stroke survivors. The mean age of the participants ranged between 54 and 67 years. More male (41.1%) than female subjects (32.6%) were involved. Five studies (26.3%) did not report participant gender distributions.

Quality appraisal of included studies

The overall quality rating across studies was good (ARHQ ≥ 6). The highest quality rating was 8 (14 studies). The quality appraisal indicated that all included studies provided sources of information regarding the QoL assessment and reported clear inclusion criteria and disclosure of the data collection location. Conversely, none of the studies controlled for confounding variables or reported response rates (Table 2).

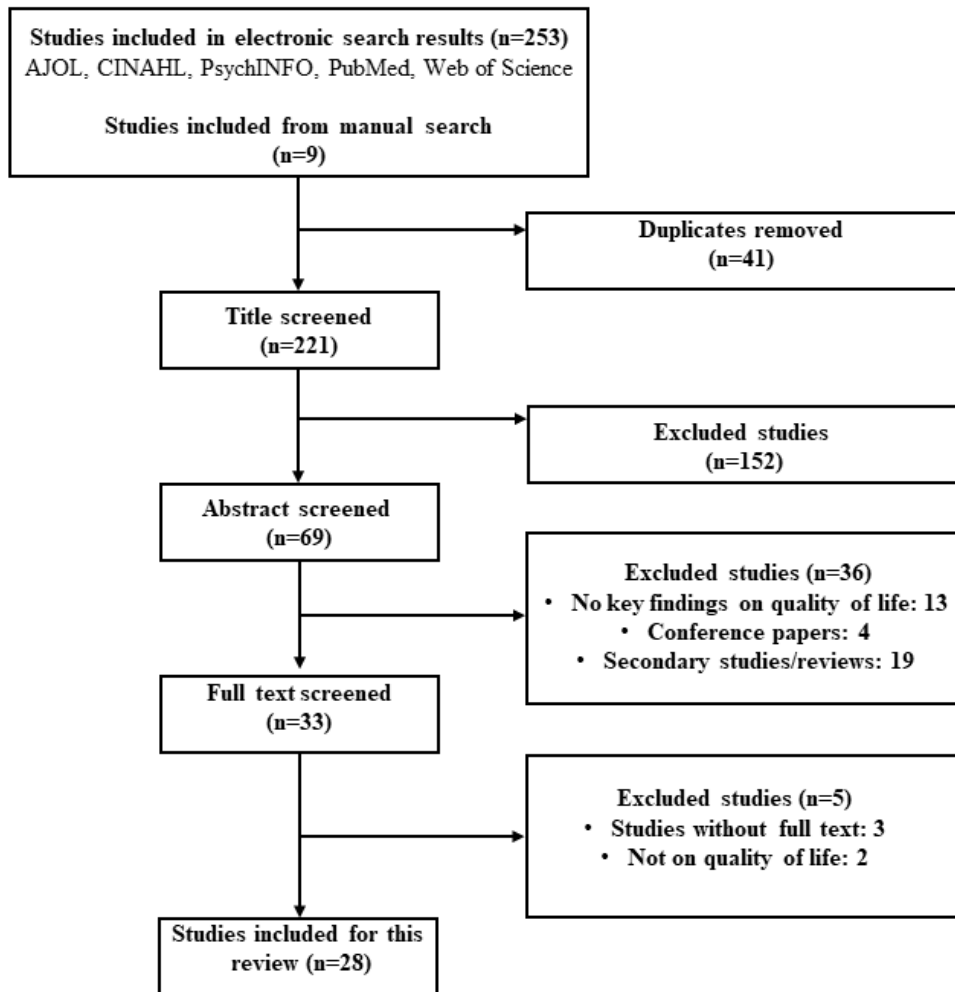


Figure 1: Study flowchart

Table 1: Characteristics/Summary of included studies

Study reference Country of origin	Participant characteristics	Location of study	Quality of life rating tool	Translation and cross-cultural adaptation of rating tool	Major finding
Abubakar and Isezuo [16] <i>Nigeria</i>	62 stroke survivors Mean age: 54±9.9 M/F ratio: 33/29	Hospital-based	SIS-16	No	Degree of handicap and presence of depression were independent determinants of QoL among stroke survivors.
Akinpelu and Gbiri [17] <i>Nigeria</i>	84 Stroke survivors Mean age: 59±11.9 M/F ratio: 53/31 87 Healthy control Mean age: 60.2±11.9 M/F ratio: 51/36	Hospital-based	COMQoL-A-5	No	QoL of stroke survivors in south-western Nigeria is lower than that of their apparently healthy counterparts.
Akinpelu et al. [18] <i>Nigeria</i>	75 Stroke survivors. Mean age: 58.8±11.89 M/F ratio:40/35	Hospital-based	WHOQoL-Bref	Yes, Both English and Yoruba language translated versions were used.	Male stroke survivors with co-morbidity scored significantly lower than those without co-morbidity in the physical health and psychological health domains of QoL.
Akosile et al. [19] <i>Nigeria</i>	103 Stroke survivors Mean age: 62.80±11.46 M/F ratio: 53/50	Hospital-and community-based	SSQoL	No	Participants' best scores were in the vision, thinking, mood and language domains of the SS-QoL and their worst score was in the social roles' domain. Overall QoL score was slightly below 70% of the maximum possible score.
Aliyu et al. [20] <i>Nigeria</i>	115 Stroke survivors 115 healthy control Mean age: 58.8±13.3	Hospital-based	HRQoLISP-40	No	Stroke survivors had poor QoL.
Donkor et al. [21] <i>Ghana</i>	156 Stroke Survivors Mean age: 58.0±11.4 M/F ratio: 97/59	Hospital-based	HRQoLSIP-40	No	In all the QoL domains, healthy controls had significantly higher scores compared with the stroke survivors.

	156 Healthy controls Mean age: 57.6±12.0 M/F ratio: 97/59				
Fatoye et al. [22] <i>Nigeria</i>	109 Stroke survivors Mean age: 60.7±10.6 M/F ratio: 64/45	Hospital-based	WHOQoL-Bref	No	The stroke group reported lower QoL on all aspects of the WHOQoL-Bref than the control participants.
	109 Healthy control Mean age: 59.6±10.1 M/F ratio: 64/45				
Gbiri and Akinpelu [23] <i>Nigeria</i>	55 Stroke survivors. Mean age 57.4±14.8 M/F ratio: 28/27	Hospital-based	SSQoL	No	QoL of Nigerian stroke survivors is low at stroke onset, increases steadily during the first 6 months and little between 6 months and 12 months' post-stroke.
Gbiri et al. [24] <i>Nigeria</i>	55 Stroke survivors Mean age: 58.1±15.7 M/F ratio: NR	Hospital-based	SSQoL	No	Complex socio-demographic and clinical variable determine QoL in stroke survivors. Depression has negative impact on the QoL of stroke survivors.
Gbiri and Akinpelu [25] <i>Nigeria</i>	55 Stroke survivors Mean age: 58.1±15.7	Hospital-based	SSQoL	No	Mean QoL score increased significantly at day 14-day through 6-month and non-significantly through 12-month post-stroke. Functional recovery had direct positive relationship with QoL scores during the 12 months' follow-up.
Hamzat and Peters [26] <i>Nigeria</i>	16 Stroke survivors Mean age: 60.68±9.78 M/F ratio: 9/7	Hospital-based	WHOQoL-Bref	No	Significant motor function occurred in the first three and between the 5th and 6th month after stroke. Only health item of QoL was associated with improved motor function.
Hamza et al. [9] <i>Nigeria</i>	233 Stroke survivors. Mean age: 58.76±13.24 M/F ratio: 118/115	Hospital-based	SIS-39items	Yes, Hausa language translated version was used.	The study found significant improvement in functional disability among stroke survivors during recovery phase.

Heikinheimo and Chimbayo [10] <i>Malawi</i>	81 Stroke survivors Mean age: 54±16yrs M/F ratio: 47/34	Hospital-based	NEWSQoL	Yes	Poorer QoL after stroke is associated with female gender, a worse functional outcome, and older age.
Howitt et al. [11] <i>Tanzania</i>	58 Stroke survivors Mean age: 67.1±13.92 M/F ratio: 28/30 58 Healthy control mean age 67.1 ±16.63 M/F ratio: 30/28	Hospital-based	WHOQoL-Bref	No	Poorer QoL was associated with greater levels of physical disability, anxiety and depression and reduced social interaction.
Kamel et al. [27] <i>Egypt</i>	50 Stroke survivors Mean age: 55.3±8.2 M/F ratio: 31/19	Hospital-based	SIS	No	The mean total score of the SIS was lower (indicating poorer QoL) in groups with severe disability measured by Barthel Index (BI), severe impairment measured by National Institute of Health Stroke Scale (NIHSS), and moderate-severe depression.
Kusambiza-Kiingi et al. [28] <i>South Africa</i>	108 Stroke survivors Mean age: 54±12.73 M/F ratio: 48/60	Hospital-based	SSQoL	No	The QoL was poor with the lowest scores for energy and highest scores for vision and language domains.
Muli and Rhoda [29] <i>Kenya</i>	161 Stroke survivors Mean age: >65yrs M/F ratio: 71/90	Hospital-based	SF-36	No	The results showed that males scored higher than females in all the domains except in physical functioning and that the scores decline with advance in age in most domains.
Oni et al. [30] <i>Nigeria</i>	70 Stroke survivors Mean age: 57.43±9.67 M/F ratio: 38/32	Hospital-based	WHOQoL-Bref	No	Stroke survivors had Post-stroke depression. Post-stroke depression correlated positively with monthly health bill above 10,000 naira (\$61), significant post-stroke disability and poorer scores on all QoL domains.

	70 healthy controls. Mean age: 57.33± 9.33 M/F ratio: 38/32				
Owolabi [31] <i>Nigeria</i>	100 Stroke Survivors Mean age: 59.4±9.9 M/F ratio: 41/59	Hospital- based	HRQoLISP	No	The determinants of health related QoL were stroke severity, level of disability, social support, laughter and negative feelings frequencies. Psychosocial factors also determine health-related quality of life in stroke survivors.
Owolabi and Ogunniyi [32] <i>Nigeria</i>	100 Stroke survivors Mean age: 59.4±9.9 M/F ratio: 41/59	Hospital- based	HRQoLISP	No	The health related QoL profile was lower in all domains in the stroke patients than the control group.
	100 healthy control. Mean age: 57.6±12.4 M/F ratio: 41/59				
Owolabi [33] <i>Nigeria</i>	100 Stroke survivors Mean age: 58.9±10.9 M/F ratio: 43/57	Hospital- based	SF-36 HRQoLISP	No	Gender, Socio-economic class and stroke type had no significant impact on Health-related quality of life. The consistent independent statistical predictors of health-related QoL were stroke severity, disability, laughter and negative-feeling frequencies.
Owolabi [34] <i>Nigeria</i>	Nigeria: 100 Stroke survivors, Mean age: 59.4±9.9 100 healthy controls Mean age: 57.6±12.4	Hospital- based	HRQoLISP	No	Stroke survivors had worse health related QoL than apparently healthy adults in all domains within the physical sphere.
Owolabi [35] <i>Nigeria</i>	Nigeria: 100 Stroke survivors, Mean age: 59.4±9.9	Hospital- based	HRQoLISP	No	In regression models explaining up to 86% of the health related QoL variance in Ibadan; stroke severity, disability, emotional disorder, and sense of purpose

Oyewole et al. [36] <i>Nigeria</i>	121 Stroke survivors Mean age: 62.98±11.23	Hospital-based	SSQoL-12	No	in life were the key predictors of HRQoL after stroke. Health-related QoL decreased with increase in age and increase in global disability.
Rhoda [37] <i>South Africa</i>	100 Stroke survivors Mean age: 61±10.55 M/F ratio: 50/50	Hospital-based	EQ-5D	No	Health-related QoL was decreased in the South African stroke sample. Functional ability and urinary incontinence were the factors affecting quality of life in the sample.
Salah et al. [38] <i>Tunisia</i>	50 Stroke survivors Mean age: 59.3±10.2 M/F ratio: 30/20	Hospital-based	SF-12	Yes, Arabic language translated version was used.	The prevalence of poor physical QoL and poor mental quality of life was 98% and 82% respectively.
Vincent-Onabajo and Adamu [39] <i>Nigeria</i>	100 Stroke survivors. Mean age: 55.32±13.9 M/F ratio: 66/34	Hospital-based	HRQoLISP-26	No	Post-stroke fatigue has significant impact on emotional domain of QoL.
Vincent-Onabajo et al. [40] <i>Nigeria</i>	55 Stroke survivors Mean age: 58±12.7 M/F ratio: 33/22	Hospital-based	HRQoLISP-40	No	Participation was the sole significant determinant of health related QoL at 1, 3, and 6 months' post-stroke.

Abbreviations: QoL, Quality of life; SIS, Stroke Impact Scale; COMQoL, Comprehensive Quality of Life Questionnaire; WHOQoL-Bref, World Health Organization Quality of Life Bref; SSQoL, Stroke Specific Quality of life; HRQoL, Health-related quality of life; HRQoLISP, Health related quality of life in stroke patient; NEWSQoL, Newcastle Stroke-specific Quality of Life Measure; SF, Short form and EQ-5D, Euro Quality of life.

Table 2: The Agency for Healthcare Research and Quality (ARHQ) methodological checklist for observational studies reporting the quality of the included studies

Study reference	1	2	3	4	5	6	7	8	9	10	Total score
Abubakar and Isezuo [16]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Akinpelu and Gbiri [17]	Y	Y	Y	N	Y	Y	Y	Y	N	N	7
Akinpelu et al. [18]	Y	Y	Y	N	Y	Y	Y	Y	N	N	7
Akosile et al. [19]	Y	Y	Y	N	Y	Y	Y	Y	N	N	7
Aliyu et al. [20]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Donkor et al. [21]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Fatoye et al. [22]	Y	Y	Y	N	Y	Y	Y	Y	N	N	7
Gbiri and Akinpelu [23]	Y	Y	N	Y	Y	Y	Y	Y	N	N	7
Gbiri et al. [24]	Y	Y	N	N	Y	Y	Y	Y	N	N	6
Gbiri and Akinpelu [25]	Y	Y	N	N	Y	Y	Y	Y	N	N	6
Hamzat and Peters [26]	Y	Y	Y	N	Y	Y	Y	Y	N	N	7
Hamza et al. [9]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Heikinheimo and Chimbayo [10]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Howitt et al. [11]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Kamel et al. [27]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Kusambiza-Kiingi et al. [28]	Y	Y	Y	N	Y	Y	Y	Y	N	N	7
Muli and Rhoda [29]	Y	Y	N	Y	Y	Y	Y	Y	N	N	7
Oni et al. [30]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Owolabi [31]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Owolabi and Ogunniyi [32]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Owolabi [33]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Owolabi [34]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Owolabi [35]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Oyewole et al. [36]	Y	Y	N	Y	Y	Y	Y	Y	N	N	7
Rhoda [37]	Y	Y	Y	N	Y	Y	Y	Y	N	N	7
Salah et al. [38]	Y	Y	Y	Y	Y	Y	Y	Y	N	N	8
Vincent-Onabajo and Adamu [39]	Y	Y	N	N	Y	Y	Y	Y	N	N	6
Vincent-Onabajo et al. [40]	Y	Y	Y	N	Y	Y	Y	Y	N	N	7

Y: yes; N: no.

1. Is the source of information reported regarding quality of life?
2. Were inclusion criteria reported?
3. Were exclusion criteria reported?
4. Was the time frame of recruitment reported?
5. Was the recruitment setting reported?
6. Were subjects consecutively recruited or population based?
7. Have the outcomes for quality of life been tested for measurement properties?
8. Were all participants included in the analysis?
9. Has confounding been assessed and controlled for (subgroups analysis of multi variate analysis)?
10. Was response rate reported?

Quality of life assessment tools, translation, cross-cultural adaptation and psychometric evaluation

The most commonly used scale for assessing QoL in stroke patients was the Health-Related Quality of Life in Stroke Patients-40 (HRQoLISP-40) [8 (28.6%)] with only one study using the shorter version (HRQoLISP-26) [1 (3.6%)]. This was followed by the Stroke Specific Quality of Life (SSQoL) [6 (21.4%)], the World Health Organization Quality of Life Bref (WHOQoL-Bref) [5 (17.9%)] and the Short Form-36 (SF-36) [2 (7.1%)]. Others were the Short Form-12 (SF-12) [1 (3.6%)], the Euro Quality of life (EQ-5D) [1 (3.6%)], the Comprehensive Quality of Life Questionnaire (COMQoL-A-5) [1 (3.6%)], the Newcastle Stroke-specific Quality of Life Measure (NEWSQoL) [1 (3.6%)], the Stroke Impact Scale-16 (SIS-16) [1 (3.6%)] and the Stroke Impact Scale-39 (SIS-39) [1 (3.6%)]. Interestingly, only 4 (14.3%) of the studies used a translated and cross-culturally adapted assessment version during data collection. Only 3 (10.7%) studies used psychometrically tested versions of the translated and cross-culturally adapted tools.

Overall Quality of life

The overall QoL was reported in 21 studies (Table 3). Six studies [30,28,9,38,35,10] provided mean QoL across several domains that were used to estimate the mean overall QoL, whereas one study [11] provided the median and interquartile range QoL scores across four domains, which were used to compute the mean overall QoL (Table 3). Six studies compared the QoL of stroke survivors to healthy participants (n=1241). These results were pooled for the meta-analysis (Figure 2). The results showed a biased-adjusted standardised mean difference (Hedges's g) of 1.13 (95% CI 0.71 to 1.56; $p < 0.001$), indicating better QoL among healthy participants compared with stroke survivors. However, considerable heterogeneity was found among the included studies (Chi-square 59.8; p -value 0.00001; $I^2 = 92\%$). Overall, post-stroke QoL increased significantly from 1 month to 3 months [24,25,27,40], 6 months [24,25,40] and 12 months [23,25,9,40]. The cognitive function did not significantly affect the QoL.[11] Alternatively, an increase in functional performance was significantly associated with increased QoL over a 12-month period following the onset of stroke [25]. Lastly, high community reintegration was significantly associated with an improved QoL post-stroke ($r=0.519$, $p < 0.0001$) [28].

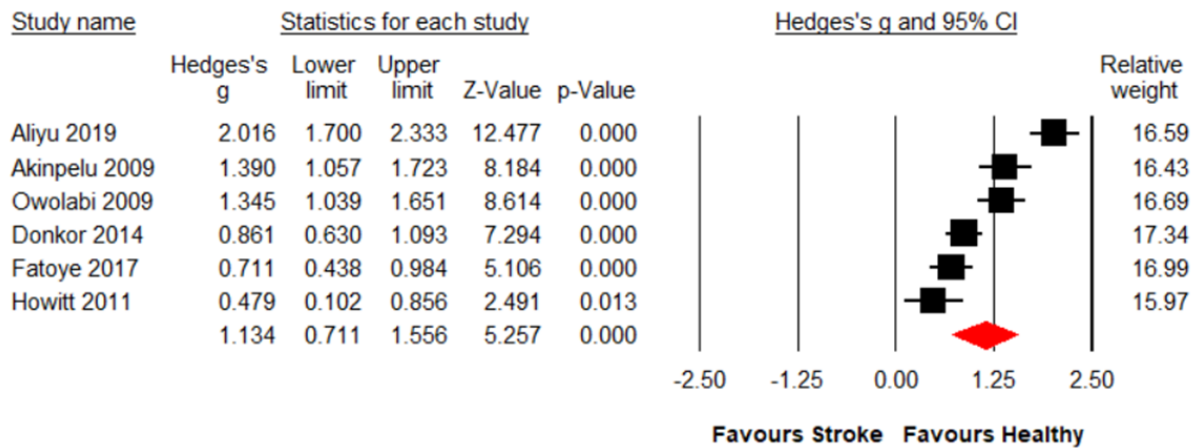
Table 3: Overall QoL of stroke survivors in Africa

QoL tool/ outcome measure	Reference	Classification of QoL			Effect size/comment
		Poor/ decrease	unclassified	Good/ increase	
WHOQoL- Bref	Akinpelu et al. [18]	✓			Mean overall QoL = 3.71 ± 0.98
	Fatoye et al. [22]	✓			Mean overall QoL = 3.56±0.9 (stroke), 4.10±0.58 (control)
	Hamzat and Peters [26]			✓	Mean overall QoL = 3.17 (1 month), 3.88 (6 month) F=5.81, p>0.05
	Howitt et al. [11]	✓			Overall QoL = 3.0 ± 1.17 (stroke), 3.5±0.9 (control) Estimated from median and interquartile range scores
	Oni et al. [30]		✓		Average QoL (estimated from 6 domains) = 52.95
SSQoL	Akosile et al. [19]			✓	Mean overall QoL = 156.71 ± 41.64 Classified as fairly good
	Gbiri et al. [24]			✓	F=0.17 p<0.01 (3 months), F=1.07 p<0.01 (6 months)
	Gbiri and Akinpelu [23]			✓	Mean overall QoL increased from 5.32±2.41 (1 month) to 222.43±16.14 (12 months), p<0.001
	Gbiri and Akinpelu [25]			✓	Mean overall QoL increased from 51.3±2.0 (1 month) to 103.2±24.5 (3 month) p<0.01, 203.1±33.3 (6 months) p<0.01, 222.43 (SD not reported) (12 months) p>0.05
	Kusambiza-Kiingi et al. [28]	✓			Average QoL (estimated from 12 domains) = 13 Classified as low
	Oyewole et al. [36]		✓		Mean overall QoL = 39.7±9.4
SIS	Abubakar and Isezuo [16]		✓		Mean overall QoL= 68.9±26.1 at 3 months Range=21-100
	Hamza et al. [9]			✓	Average QoL (estimated from 10 domains) = 51.15 (6 month), 53.76 (12 month), QoL significantly increased from 6 to 12 months across all domains except emotion (p<0.05)
	Kamel et al. [27]			✓	Mean overall QoL = 69.6±15.2 (1 month), 68.66±17.3 (3 month), p<0.05
SF-36	Muli and Rhoda [29]		✓		Average QoL (estimated from 8 domains) = 36.57%
	*Owolabi [33]		✓		Mean overall QoL = 53±24
	Salah et al. [38]		✓		Average QoL (estimated from 2 domains) = 35.68 Short version of the form (SF-12) used
HRQoLISP	Aliyu et al. [20]	✓			Mean overall QoL = 66.1 ± 10.7(stroke), 86.1 ± 9(control), t=-17.74, p<0.0001
	Donkor et al. [21]	✓			Mean overall QoL = 69.0±13.3 (stroke), 79.5±10.9 (control), p<0.0001
	Owolabi and Ogunniyi [32]	✓			Mean overall QoL = 73.5±9.1 (stroke), 84.4±6.9 (control), p=0.002
	Owolabi [31]	✓			Mean overall QoL = 73.5±9.1
	*Owolabi [33]	✓			Mean overall QoL = 72±9

	#Owolabi [34]	✓			Mean overall QoL = 73.5±9.1 (stroke), 84.4±6.9 (control), p=0.002
	# Owolabi [35]	✓			Average QoL (estimated from 2 domain spheres) = 73.95
	Vincent-Onabajo and Adamu [39]		✓		Mean overall QoL = 57.92±14.58
	Vincent-Onabajo et al. [40]			✓	Mean overall QoL increases from 58.0±8.7 (1 month), 59.4 ±10.3 (3 month), 61.6±10.2 (6 month), to 65.9±10.6 (12 months)
NEWSQoL	Heikinheimo and Chimbayo [10]			✓	Average QoL (estimated from 11 domains) = 78.27 Patients rated their QoL as high, with NEWSQoL scores above 50% in each domain
EQ-5D	Rhoda [37]	✓			T= 2.662, p=0.01 Reported as degreasing from 2 to 6 months
COMQoL-A-5	Akinpelu and Gbiri [17]	✓			Mean overall QoL= 41.99±12.86, (stroke), 56.25±6.74 (control), p<0.01

* Same study with two measures, # result exclude non-African participants (Berlin).

Abbreviations: QoL, Quality of life; WHOQoL-Bref, World Health Organization Quality of Life Bref; SSQoL, Stroke Specific Quality of life; SIS, Stroke Impact Scale; SF, Short form; HRQoLISP, Health related quality of life in stroke patient; NEWSQoL, Newcastle Stroke-specific Quality of Life Measure; EQ-5D, Euro Quality of life; COMQoL-A-5, Comprehensive Quality of Life Questionnaire; T, t-test value and F, f-test of mean values/ANOVA.



Model	Effect size and 95% confidence interval					Test of null (2-Tail)		Heterogeneity				Tau-squared				
	Number Studies	Point estimate	Standard error	Variance	Lower limit	Upper limit	Z-value	P-value	Q-value	df (Q)	P-value	I-squared	Tau Squared	Standard Error	Variance	Tau
Fixed	6	1.105	0.062	0.004	0.984	1.225	17.958	0.000	59.826	5	0.000	91.642	0.254	0.181	0.033	0.504
Random	6	1.134	0.216	0.047	0.711	1.556	5.257	0.000								

Figure 2: Forest plot showing the quality of life among stroke survivors and healthy controls

Domain-specific quality of life among stroke survivors in Africa

Stroke survivors in Africa scored significantly lower in the general/overall health [17,22,11], physical health [21,22,11,32,34], psychological/emotional [17,21,22,9,11,32,34], cognitive [21,32,34], eco-social/social relationship [21,22,11,32,34], spiritual [21], soul/spirit [21,32,34], productivity, community [17] and environmental [11] domains when compared with healthy controls. In the physical domain including activities of daily living, mobility, hand function and social participation, the QoL significantly increased from baseline to 3 months [27] following the stroke. Similarly, at 6 months follow-up, overall health significantly increased [26]. At 12 months following stroke, the physical health, strength, mobility, hand function, communication, activities of daily living, social participation and memory/thinking significantly increased [9]. Activities of daily living and communication domains were positively associated with better functional outcomes characterised by low modified ranking scale scores [10]. Poor physical ($p=0.038$) and psychological health ($p=0.022$) domains were significantly associated with great levels of anxiety [11]. Other studies found non-statistically significant difference post-stroke in the domains of environment [22,26], physical health [26], psychological/emotional [26,10,27], intimacy/feeling [17,10], cognition/memory [10,27], mobility, sleep, relationship, pain, vision, fatigue [10], communication [27] and spiritual interaction [32,34].

Socio-demographic/clinical factors affecting the overall quality of life and its domains

Significant sociodemographic and clinical factors ($p<0.05$) affecting the QoL included age [17,23,9-11,29,36] and gender [23,18,10,39]. The age at disease onset significantly and negatively associated with QoL and activities of daily living [10], psychological health [31] and physical health [11,29]. Similarly, females have significantly lower QoL in the domain of cognition and fatigue [10]. Other significant factors affecting the QoL include marital status [24,23,9,29], spouse support [24,23], social support [24], educational attainment [24,23,29], occupation, stroke duration [29], functional ability, nature of stroke [39] and conditions such as hypertension, diabetes, alcohol intake and high cholesterol [21]. Some studies reported age [16,40] gender [16,19,17,25,11,29,33,40], educational status [16,39], socioeconomic status [17,11,33], marital status [25,35,40], occupational/employment status [25,39,40] and religious belief [25] as non-significant factors for QoL. G. O. Vincent-Onabajo et al. [40] added that age and gender do not significantly affect QoL at 1, 3, 6 or 12 months post-stroke. Furthermore, no significant difference was found in post-stroke duration [17-19,11,39], stroke type [33,35,39,40] and side of limb affected [18,25].

Predictors of quality of life among stroke survivors in Africa

This review found the level of disability (35.8% of studies), post-stroke depression (28.6%), stroke severity (28.6%), presence of co-morbidities (21.4%), stroke duration (14.3%), laughter frequency (14.3%), negative feelings (14.3%), motor impairment/function (10.7%), age (7.1%), post-stroke fatigue, prior mental illness, general health, social support and life purpose (3.6% each) as the key predictors for QoL among stroke survivors in Africa (Table 4). People with severe disability are two times (Odds ratio (OR) = 2.42, $p=0.012$) more likely to have lower QoL scores [16], whereas those with post-stroke depression are more than six times (OR = 6.2, $p = 0.022$) as likely to have poor QoL scores [38]. Additionally, post-stroke depression is a significant determinant of poor QoL at 3 months [24], 6 months [24,9] and 12 months [9]. Greater stroke severity is also a significant predictor of poor QoL at 3 months [24,40], 6 months [24,40] and 12 months [40]. Accompanying co-morbidities, such as diabetes, cerebrovascular diseases and musculoskeletal disorders, exert a significant effect on QoL [18,20,21,24,25]. For instance, having diabetes influences the physical domain of QoL [18,21] and is associated with poor QoL at 3 or 6 months post-stroke [24]. Similarly, severity of dysarthria ($F = 7.92$; $p = 0.00$), aphasia ($F = 6.87$; $p = 0.00$), sensory deficit (10.68 ; $p = 0.00$) and unilateral spatial neglect ($F = 7.92$; $p = 0.00$) at the onset of stroke exert a significant negative influence on the recovery of various activities of daily living 6-months post-stroke, each of which affects QoL [25]. Taking anti-hypertensive medications post-stroke is a significant determinant of improved physical health ($r = 0.481$, $p<0.001$) and retaining social relationships ($r = 0.330$, $p = 0.018$) [11]. Interestingly, increase in laughter frequency [21,31,33,35], social support [33] and overall health [22] significantly improves QoL (Table 4).

Table 4: Predictors for QoL among stroke survivors in Africa

Determinant	Reference	Scale/ measure	Effect size	Comments
Depression	Abubakar and Isezuo [16]	ZDS scale	OR = 1.08 95%CI (1.01-1.15), p=0.011	Determinant of HRQoL at 3 months post-stroke
	Aliyu et al. [20]	HD scale	OR=0.48 95%CI (0.24-0.95), p=0.037	Determinant of QoL post-stroke in comparison to healthy controls
	Gbiri et al. [24]	CES-D	QoL Linear regression value = 0.31 (3 months), 0.53 (6 months)	Determine QoL at 3 and 6 months
	Hamza et al. [9]	BDI score	R= -0.265 p<0.001 (6 month), -0.149 p<0.05 (12 month) (strength), R=-0.184 p<0.001 (6 month) (physical), R= -0.246 p<0.001 (6 month), -0.236 p<0.001 (12 month) (memory), R= -0.317 p<0.001 (6 month), -0.217 p<0.01 (12 month) (emotion)	Determinant of strength, physical, memory/thinking and emotion QoL domains
	Howitt et al. [11]	HAD	r= -0.422 p=0.002 (physical), -0.383 p=0.006 (psychological), -0.294 p=0.036 (environment)	Determinant of physical, psychological and environmental domains
	Kamel et al. [27]	BDI	Mean±SD = 50.1 ± 12.6 (present), 68.5 ± 12.6 (absent), p=0.001	BDI score above 17 is considered as depression
	Oni et al. [30]	SCAN	T=-5.01 p<0.001 (overall health), T=-4.65 p<0.001 (satisfaction), T=-6.10 p<0.001 (physical), T=-2.15 p<0.001 (social), T= -2.49 p<0.001 (environment)	Compares participants with & without post-stroke depression
	Salah et al. [38]	HAD	OR= 6.2 95%CI(1.296-29.393), p=0.022	Determinant of poor physical QoL
Level of disability/ handicap	Abubakar and Isezuo [16]	MRS	OR=2.42, 95%CI (1.21-4.85), p=0.012	Determinant of poor QoL at 3 months
	Hamza et al. [9]	MRS	R= -0.523 p<0.001 (6 month), -0.337 p<0.001 (12 month) (strength), R=-0.305 p<0.001, -2.234 p<0.01 (12 month) (social)	Determinant of strength and social participation QoL domains
	Howitt et al. [11]	MRS BI	r= 0.451 p≤0.01 (physical using MRS) r= 0.471 p≤0.01 (physical using BI), -0.284 p≤0.05 (environment using BI)	Determinant of physical and environmental domains
	Kamel et al. [27]	BI	Mean±SD = 68.8 ± 15.3 (mild), 64.1 ± 11.8(moderate), 50.9 ± 14.3 (severe), p=0.004	Determinant of severe disability
	Owolabi and Ogunniyi [32]	MRS	F = 7.912, P < 0.00001 (physical), F = 5.549 P < 0.00001 (psychological domain), F = 4.748, P = 0.001 (cognitive domain), F = 4.102, P = 0.003 (eco-social domain)	Determinant of physical, psychological, cognitive and eco-social domains
	Owolabi [31]	MRS	T= -5.04 p<0.001 (physical), -3.70 p0.001 (psychological), -4.43 p<0.001 (eco-social)	Determinant of physical, psychological, and eco-social domains
	Owolabi [33]	MRS	T=-4.891 p<0.001 (physical health), -2.931 p=0.005 (psychological), -4.172 p<0.001 (eco-social), -5.915 p<0.001 (physical functioning), -	Domains assessed in relation to both HRQoLISP and SF-36

			4.217 p<0.001 (physical role limitation), -2.828 p<0.001 (emotional role limitation), -3.775 p<0.001 (general health)	
	Owolabi [35]	MRS	R= -0.47 p<0.001 (eco-social)	Determinant of eco-social domain
	Oyewole et al. [36]	WHODAS	T= 14.68 p=0.001 (psychological) T= 35.85 p=0.0001 (physical)	Determinant of physical and psychological domains
	Vincent-Onabajo et al. [40]	LHS	r= 0.85 p<0.001 (1 month), 0.81 p<0.001 (3 month), 0.87 p<0.001 (6 month), 0.86 p<0.001 (12 month)	Level of disability assessed in-terms of restriction to participate in different activities
Motor impairment/ function/ performance	Hamza et al. [9]	BI	R=0.351 p<0.001 (6 month), 0.402 p<0.001 (12 month) (hand function), R=0.722 p<0.001 (3 month), 0.625 p<0.001 (6 month) (ADL), R=0.825 p<0.001 (6 month), 0.767 p<0.001 (12 month) (mobility), R=0.650 p<0.001 (6 month), 0.567 p<0.001 (12 month) (physical), R=0.382 p<0.001 (6 month), 0.350 p<0.001 (12 month) (social)	Determinant of hand function, ADL, mobility, composite physical and social participation QoL domains
	Howitt et al. [11]	MRC scale	r= 0.346 p<0.05 (general mobility) r=-0.335 p<0.05 (lower limp power)	Determinant of perceived QoL in general mobility and lower limp power
	Vincent-Onabajo et al. [40]	FIM S-FM	Functional activity (FIM): r= 0.67 p<0.001 (1 month), 0.66 p<0.001 (3 month), 0.61 p<0.001 (6 month), 0.70 p<0.001 (12 month) Motor Function (S-FM): r= 0.6 p<0.001 (1 month), 0.59 p<0.001 (3 month), 0.67 p<0.001 (6 month), 0.69 p<0.001 (12 month)	Determinant of functional activity and motor function
Stroke levity /severity	Donkor et al. [21]	Questionnaire	T= 5.31 p<0.0001 (physical), 4.57 p<0.0001 (psycho-emotional), 4.92 p<0.0001 (cognitive), 4.33 p<0.0001 (eco-social), 2.81 p=0.006 (soul), 2.18 p=0.03 (spirit)	Determinant of physical, psycho-emotional, cognitive, eco-social, soul and spirit domains
	Gbiri et al. [24]	NIHSS	QoL Linear regression value = 4.62 (3 months), 1.01 (6 months), p<0.05	Determine QoL at 3 and 6 months
	Owolabi and Ogunniyi [32]	SLS	r= 0.527 p<0.01 (physical), 0.399 p<0.01 (psychological), 0.40 p<0.01 (cognitive), 0.269 p<0.05 (eco-social)	Determinant of physical, psychological, cognitive & eco-social domains
	Owolabi [31]	SLS	T=2.52 p=0.015	Determinant of Intellectual domain
	Owolabi [33]	SLS	T= 2.571 p=0.013 (cognitive), 2.34 p=0.022 (vitality), 3.292 p=0.002 (social)	Domains assessed in relation to both HRQoLISP and SF-36
	#Owolabi [34]	SLS MRS	r= -0.78 p<0.0001 (physical using MRS), 0.72 p=0.002 (physical using SLS)	Determinant of physical sphere HRQoL (physical, psycho-emotional, cognitive, eco-social)
	#Owolabi [35]	SLS	R=0.386 p=0.013	Determinant of physical domain
	Vincent-Onabajo et al. [40]	SLS	F=3.79 p<0.001 (1 month), 3.92 p<0.001 (3 month), 4.61 p<0.001 (6 month) and 4.41 p=0.01 (12 month)	Determinant of overall QoL

Stroke duration	Donkor et al. [21]	Questionnaire	T=3.99 p<0.028 (psycho-emotional), -2.25 p=0.027 (cognitive), -3.125 p=0.002 (spirit)	Determinant of psycho-emotional, cognitive and spirit
	Owolabi [31]	Unclear	T=2.62 p=0.01 (spirit), 2.91 p=0.006 (eco-social)	Determinant of spirit and eco-social domains
	Owolabi [33]	Unclear	T= 2.477 p=0.016 (spirit), 3.083 p=0.004 (eco-social)	Determinant of spirit and eco-social domains
	Salah et al. [38]	SF-12	OR = 4.0 95%CI(1.122-14.265), p=0.033	Determinant of poor QoL in comparison to good QoL
Post-stroke fatigue	Vincent-Onabajo and Adamu [39]	FSS	R = -0.36, p<0.001	Determinant of physical, emotional, cognitive and eco-social domains
Prior mental illness	Fatoye et al. [22]	GHQ-30	T=2.76 p<0.01 (physical), -4.25 p<0.001 (environment)	Predicts physical and environmental QoL domains
General health	Fatoye et al. [22]	GHQ-30	T=-4.72 p<0.001 (physical), -7.37 p<0.001 (psychological), -2.73 p<0.01 (social)	Determinant of physical, psychological & social relationship domains
Social support	Owolabi [33]	Likert scale	T= 6.523 p<0.001	Determinant of eco-social domain
Life purpose	#Owolabi [35]	Likert scale	R= 0.033 p=0.163 (soul), 0.303 p=0.005 (spirit)	Determinant of soul and spirit domains
Age	Donkor et al. [21]	Questionnaire	T=-2.45 p=0.016 (physical), -0.21 p=0.041 (eco-social), T=-2.38 p=0.02 (soul)	Determinant of physical, eco-social & soul domains
	Gbiri et al. [24]	Unclear	QoL Linear regression value = 0.68 (3 months), 1.16 (6 months), p<0.05	Determine QoL at 3 and 6 months
Laughter frequency	Donkor et al. [21]	Questionnaire	T=6.30 p<0.0001 (psycho-emotional), 2.67 p=0.009 (cognitive), 3.11 p=0.003 (eco-social), 3.33 p=0.001 (soul), 2.59 p=0.011 (spiritual)	Determinant of psycho-emotional, cognitive, eco-social, soul and spiritual domains
	Owolabi [31]	Likert scale	T=3.06 p=0.006 (physical), 5.09 p<0.001 (psychological), 3.9 p<0.001 (intellectual)	Determinant of physical, psychological and intellectual domains
	Owolabi [33]	Likert scale	T=2.605 p=0.015 (physical health), 5.431 p<0.001 (psychological), 4.032 p<0.001 (cognitive), 2.954 p=0.007 (soul), 2.692 p<0.009 (physical functioning), 2.837 p=0.006 (physical role limitation), 2.014 p=0.048 (vitality), 3.278 p=0.002 (social), 2.8 p=0.007 (general health)	Domains assessed in relation to both HRQoLISP and SF-36
	#Owolabi [35]	Likert scale	R= 0.441 p<0.001 (psycho-emotional), 0.326 p=0.004 (cognitive)	Determinant of psycho-emotional and cognitive domains
Negative feelings	Donkor et al. [21]	Questionnaire	T= 3.97, p<0.0001	Determinant of psycho-emotional domain
	Owolabi [31]	Likert scale	T=3.52 p<0.001	Determinant of psychological domain

	Owolabi [33]	Likert scale	T= 3.196 p=0.002 (psychological), 2.631 p=0.01 (emotional role limitation), 3.168 p=0.002 (vitality), 5.917 p<0.001 (mental health), 4.318 p<0.001 (bodily pain)	Domains assessed in relation to both HRQoLISP and SF-36
	#Owolabi [35]	Likert scale	R= 0.453 p=0.004 (physical), 0.336 p<0.001 (psycho-emotional)	Determinant of physical and psycho-emotional domains
Co-morbidities	Akinpelu et al. [18]	WHOQoL-Bref	Mean score=29.8±12.1 (physical domain), 37.2±8.3 (psychological domain)	Co-morbidities; Headache, Shoulder Pain, Diabetes, Osteoarthritis, Low-back Pain, Delayed Union of fracture, Vision Problem
	Aliyu et al. [20]	HRQoLISP-40	OR=0.14 95%CI (0.09-0.22) – Aphasia, OR = 0.22 95%CI (0.15—0.31) - Lesion location	Co-morbidities; aphasia and lesion location
	Donkor et al. [21]	Questionnaire	Diabetes significantly affect physical domain (P = 0.033), heart disease affect cognitive domain (P= 0.039) and eco-social domain (P=0.044)	Co-morbidities; diabetes and heart disease Only p value reported
	Gbiri et al. [24]	SSQoL	QoL Linear regression value = 14.51 (3months), 2.05 (6 months)	Diabetes Other co-morbidities not specified
	Gbiri and Akinpelu [25]	SSQoL	F = 7.92; p = 0.00 (dysarthria), F = 6.87; p = 0.00(aphasia), F = 10.68; p = 0.00 (sensory deficit), F = 7.92; p = 0.00 (unilateral spatial neglect)	Co-morbidities; dysarthria, aphasia, sensory deficit and unilateral spatial neglect
	Rhoda [37]	ED-5D	T= -3.172, P=0.002	Co-morbidity: urinary incontinence

result exclude non-African participants (Berlin).

Abbreviations: OR, Odds ratio; R, regression standardised coefficient; r, correlation coefficient; T, t-test value; F, f-test of mean values/ANOVA; QoL, Quality of life; ADL, activity of daily living; MRS, Modified Ranking scale; SLS, stroke levity score; ZDS, Zung Depression Self-reporting; HRQoL, Health-related quality of life; SSQoL, Stroke Specific Quality of life; WHOQoL-Bref, World Health Organization Quality of Life Bref; HRQoLISP, Health related quality of life in stroke patient; GHQ, General Health Questionnaire; BADL, basic activity of daily living; IADL, instrumental activity of daily living; CADL, Communicative abilities of daily living; NIHSS, National Institute of Health Stroke-Scale; CES-D, Center for Epidemiological Scale-Depression; HD, Hamilton Depression; BDI, Beck Depression Inventory; MRC, Medical Research Council; BI, Barthel Index; HAD, Hospital Anxiety Depression scale; SCAN, Schedule for Clinical Assessment in Neuropsychiatry; WHODAS, World Health Organisation Assessment Schedule; FSS, fatigue severity scale; FIM, functional independent measure; S-FM, Simplified Fugl-Meyer Assessment and LHS, London Handicap scale.

DISCUSSION

This review assessed the QoL of stroke survivors in Africa. The review also focused on the clinical and anthropometric predictors of QoL and the measurement properties of the assessments used. Meta-analysis of pooled data showed a significantly lower overall QoL among the stroke survivors when compared with the healthy controls. Six longitudinal studies of good methodological quality reported a progressive improvement in the QoL over 1 to 12 months of recovery following stroke. The use of translated and/or cross-culturally adapted tools for QoL assessment was sparse. Degree of disability, depression and severity of stroke are strong predictors of QoL. The findings from this review regarding overall QoL and predictors of QoL among stroke survivors are consistent with a previous review [12].

Globally, stroke survivors report low QoL for reasons related to the cost of optimal medical services, lifestyle factors, low medical literacy, environmental and socioeconomic factors and inadequate adherence to interventions [41,42]. In Africa and other developing nations, other unique factors such as inadequate access to rehabilitation services, insufficient social support and care service networks, socio-economic constraints, poor community reintegration programs for disabled individuals, sub-standard healthcare services, lack of post-disability home modifications, and cultural and traditional beliefs negatively impact QoL during stroke recovery [43-47]. Nonetheless, family and community support systems [48] and characteristic religious inclination evident across many African settings [49] might play a role in positively coping with protracted and life-long disability [50-53]. This finding could explain the observed direct relationship between QoL and stroke duration in included longitudinal studies.

The most frequently reported QoL domains were general/overall health, physical health, psychological/emotional, cognitive, eco-social/social relationship and soul/spirit. Interestingly, we found a significant increase in QoL in the first 3 months after stroke in the physical domain, activities of daily living, mobility, hand function and social participation. This result could be due to initial rehabilitation interventions, often associated with the betterment of QoL. Long-term effect of such interventions might be responsible for the observed improvement in the overall health at 6 months post-stroke. Furthermore, the significant increase in the domains of communication, social participation and memory/thinking between 9 and 12 months post-stroke might have relevant implications with regard to future rehabilitation practices for stroke survivors.

The most common predictors of QoL are post-stroke disability, depression and stroke severity. Post-stroke disability might lead to a deterioration in QoL for patients and caregivers [54,55]. For caregivers, the burden of caring for individuals with stroke is associated with declines in their own mental health (e.g.

depression) [55,56]. Stroke severity indirectly impacts QoL by affecting sociodemographic and clinical outcomes [56]. Associated co-morbidities also affect QoL by exacerbating functional impairment and ultimately reducing survival rates [57].

The Health-related quality of life in stroke patient-40 (HRQoLISP-40), Stroke Specific Quality of life (SSQoL) and World Health Organization Quality of Life Bref (WHOQoL-Bref) were the most frequently used tools for assessing QoL in African stroke survivors. However, only 14% of the eligible studies used translated and cross-culturally validated measures during data collection. Thus, concerns regarding the contextual efficacy of the assessments used were raised, and participants' understanding of the domains and constructs they intended to assess was questioned. Guillemin et al. [58] stressed the significance of translating and cross-culturally adapting outcome measures for use in different cultural, linguistic and political contexts. The lack of adapted and cross-validated assessment tools in African languages may limit the robust examination of QoL. It may inadvertently lead to the unnecessary exclusion of potential research participants due to linguistic barriers. Hence, translation, cross-cultural adaptation, validation and psychometric evaluation of clinically relevant tools which facilitate the in-depth assessment of QoL across continental Africa are genuinely needed.

Strength and limitations of the study

To the best of our knowledge, this is the first systematic review and meta-analysis assessing the QoL of stroke survivors throughout Africa. The study has a number of strengths. Firstly, we conducted a meta-analysis on QoL scores comparing stroke survivors to healthy volunteers reported in some of the included studies. Secondly, we conducted a systematic search of the literature using pertinent search terms, including all the countries in Africa. Finally, we adopted the Agency for Healthcare Research and Quality (ARHQ) methodological checklist to assess the methodological quality of the included studies, which is appropriate for observational studies. The review has some limitations that should be considered regarding the interpretation of the findings herein. Firstly, the search limited the inclusion to articles published online in international journals. As such, articles published in local African journals that cannot be traced in the searched databases may have been unknowingly omitted. Secondly, caution should be taken when interpreting the meta-analysis results because of considerable heterogeneity among the included findings (Figure 2). Finally, we did not include conference abstracts and non-English language studies in the review.

Conclusion and recommendations

Overall, the stroke survivors in Africa reported a lower QoL than their healthy age-matched peers. Findings from this review highlight the need for cross-culturally validating QoL assessment tools for robust evaluation across Africa. We emphasise the significance of early intervention for reducing the degree of disability and depression within the first 3 months of disease onset, which in turn improves the QoL among stroke survivors. Future studies should focus on assessing the QoL level among individuals with stroke of differing chronicity and type in Africa.

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