**Impact of Stroke on Quality of Life of Stroke Patients in Ouagadougou, Burkina Faso**

**Abstract**

**INTRODUCTION** : Stroke is a diagnostic and therapeutic emergency. It causes functional sequelae and the quality of life (QOL) of survivors is often disrupted. The aim of this study was to assess the QOL of stroke survivors after at least three months of evolution.

**Patients and methods** : This was a cross-sectional study with prospective data collection, conducted from October 1 to November 30, 2021. The study population consisted of patients aged at least 18 years with a stroke confirmed by brain imaging, seen in consultation after at least three months of evolution as part of their post-stroke follow-up. Quality of life was assessed using the WHOQOL scale.

**Results** : Over the course of the study, 46 patients aged at least 18 years were seen in consultation after at least three months of stroke. The mean age of the patients was 52.8 years. Stroke was ischemic in 56.5% of patients, with a mean duration of 8.9 ± 4.9 months. The rate of non-return to work after stroke was 58.7%. Clinically, the patients had no major functional disability, no severe cognitive impairment or severe depression. Mean QOL scale for the physical and environmental domains were 49.34/100 and 49.10/100 respectively, while overall QOL was 54.20/100. On self-assessment, the QOL was judged good to very good by 43.5%. In the physical domain, 54.4% of patients had a poor to very poor QOL. Occupational status and functional disability were the main factors associated with QOL.

**CONCLUSION** : Stroke has a negative impact on survivors' quality of life. Systematic assessment of this dimension is an essential parameter for the holistic management of stroke survivors.

**Key words :** Stroke, brain imaging, severe depression, cognitive impairment

**INTRODUCTION**

Cerebrovascular disease is one of the main factors affecting life expectancy worldwide (1). Stroke is the second leading cause of death and a major cause of disability worldwide. Its incidence is rising as the population ages. In addition, young people are increasingly affected in low- and middle-income countries (2). This pathology remains a physical, psychological, social and economic burden, reducing health-related quality of life despite advances in treatment (1).

The concept of quality of life (QOL) is complex, as it is multidimensional and highly subjective (3). An assessment of the QOL of stroke victims has its place in the evaluation of post-stroke functional sequelae. QOL measures provide a broader description of the impact of the disease on various aspects of an individual's life. The literature suggests that the QOL of stroke patients is markedly impaired or diminished, especially when compared with that of the general population (1,3). Numerous determinants of post-stroke QOL have been highlighted by different authors. For some authors, post-stroke QOL was determined by functional disability (35.8%), severity of depression (28.6%) and severity of stroke (28.6%) (4,5). The influence of certain socio-demographic factors has been demonstrated elsewhere (6-11).

The aim of this study was to assess the quality of life of stroke victims after at least three months in the neurology department of CHU-B from October 1 to November 30, 2021.

**METHODOLOGY**

The study took place in the neurology department of the Centre Hospitalier Universitaire de Bogodogo in Ouagadougou (Burkina Faso) from October 1 to November 30, 2021. This was a cross-sectional study with prospective data collection carried out on a population consisting of patients aged at least 18 years who had suffered a stroke at least three months old and confirmed by brain imaging. Patients were recruited during consultations as part of their post-stroke follow-up.

The standardized French version of the WHOQOL-BREF scale was used to assess QOL. The aim of the questionnaire was to assess the four quality of life factors likely to reflect a sufficiently broad and comprehensive perception of the respondents' QOL. These four factors (domains) are

Physical health (7 items): items on pain and discomfort; sleep-rest; fatigue-energy; mobility; activities-work; dependence on treatments.

Mental health (psychological) (6 items): items on positive emotions; thinking; learning; memory and concentration; self-esteem; body image; negative emotions; spirituality and personal beliefs.

Social relationships (3 items): items on personal relationships; social support; sexual activity.

Environment (8 items): items on freedom, security; home environment; financial and medical/social resources: accessibility and quality of care; access to information; leisure activities; housing; transport.

Each domain therefore has its own range of possible scores in absolute figures :

- for physical health, the minimum possible score is 7 and the maximum 35

- for psychological health, the minimum score is 6 and the maximum 30

- for social relations, the minimum is 3 and the maximum 15

- for the environment, the minimum is 8 and the maximum 40. 23

Each domain is calculated using a grid developed by the WHOQOL-BREF creation team, to obtain a score from 0 to 100.

**Inclusion criteria**

Must have had a stroke at least three months previously, be at least 18 years of age and agree to participate in the study in a free and informed manner.

**Non-inclusion criteria**

Patients with :

- severe cognitive impairment with MMSE < 18

- severe depression with a Beck score ≥ 16

Were not included in this study as they were unable to answer the questionnaire.

**Data processing and analysis**

Data entry, management and analysis were carried out using EPI INFO version 7 software, via a mask created specifically for the questionnaire. Means, medians and standard deviations were calculated to describe quantitative variables. Frequencies (absolute and relative) were calculated for all qualitative variables. The Chi-2 test was used to compare qualitative variables. A univariate analysis was performed, looking for an association between quality of life and various sociodemographic, clinical and paraclinical factors. Logistic regression was used, given the association of quantitative and qualitative variables. The dependent variable was post-stroke quality of life, and the independentvariables were sociodemographic data, clinical and paraclinical data, and tests performed. A significance level of p less than 0.05 was used.

**Ethical and deontological considerations**

The research was conducted in accordance with the protocol and good clinical practice. We obtained a collection authorization from the Director General of Bogodogo University Hospital. We explained the purpose of the studyclearly and fairly, in concise and precise terms, so as to give patients the choice of whether or not to be included in our study. Anonymity and confidentiality were respected.

**RESULTS**

During the study period, the neurology department registered a total of 146 patients in consultation, including 80 patients with clinically diagnosed stroke confirmed on cerebral CT, i.e. 54, 79% of neurology consultations at CHU-B. Of these 80 patients, we selected 46 for our study, taking into account our inclusion and non-inclusion criteria, i.e. 57.5% of stroke patients followed up in consultation during the study period.

The mean age of patients was 52.8 ± 10.2 years, with extremes of 32 and 91 years. Patients aged between 50 and 60 accounted for 50% of the total number of patients in the study.

**Table 1 : Breakdown of patients by age group**

|  |  |  |
| --- | --- | --- |
| **Age (ans)** | **Effective (n=46)** | **Percentage**  **(%)** |
| [30 - 40[ | 3 | 6,5 |
| [40 - 50[ | 12 | 26,5 |
| [50 - 60[ | 23 | 50 |
| [60 - 70[ | 6 | 13 |
| ≥ 80 | 2 | 4,4 |
| TOTAL | 46 | 100 |

The majority of patients (69.6%) lived in urban areas. The proportion of patients working in the informal sector prior to stroke was 60.9%. The proportion of patients not attending school was 52.2%. The rate of non-return to work after stroke was 58.7%. In our study, 95.6% of patients were living as a couple.

Stroke was ischemic for 56.5% of patients, with a mean duration of 8.9 ± 4.9 months, ranging from 3 to 22 months. Clinically, the patients had no major functional disability, and no severe cognitive impairment such as severe depression.

Mean QOL scores were 49.34/100 for the physical domain and 49.10/100 for the environmental domain. The psychological and relational domains scored 63.89/100 and 54.45/100 respectively. Overall HRQOL was 54.20/100. On self-assessment, QOL was judged good to very good by 43.5%. In the physical domain, 54.4% of patients had a poor to very poor quality of life.

**Table 2: Distribution of quality of life scores by WHOQOL-BREF domain**

|  |  |  |
| --- | --- | --- |
| **WHOQOL-BREF domain** | **Moyenne** | **Ecart type** |
| QOL rated out of 5 | 3,06 | 1 |
| Health satisfaction out of 5 | 3,04 | 1,58 |
| QOL physical domain out of 100 | 49,34 | 20,07 |
| QOL psychological domain out of 100 | 63,89 | 19,25 |
| QOL relational domain out of 100 | 54,45 | 28,87 |
| QOL environmental field out of 100 | 49,10 | 15,60 |
| Total QOL out of 100 | 54,20 | 20,95 |

Various sociodemographic and clinical factors were associated with patients' quality of life in the aftermath of stroke.

Occupational status, stroke type and functional disability were significantly associated with the physical domain of QOL, with p<0.001, p=0.017 and p<0.001 respectively.

Occupational status, residence and functional disability were statistically associated with the psychological domain of QOL, with p<0.001, p=0.013 and p<0.001 respectively.

The relational domain of QOL was significantly associated with professional status (p=0.022) and level of education (p=0.008).

The association between the environmental domain of QOL with occupational status and functional disability was statistically significant, with p<0.001 and p=0.019 respectively.

The relationship between overall HRQOL was significant with occupational status (p=0.001) and functional disability (p=0.012).

Self-rated QOL was significantly associated with occupational status (p=0.001), place of residence (p=0.005) and functional disability (p=0.046).

**DISCUSSION**

According to the World Health Organization (WHO), quality of life is defined as “an individual's perception of his or her place in life, in the context of the culture and value system in which he or she lives, and in relation to his or her goals, expectations, norms and concerns. It is a broad conceptual field, encompassing in a complex way the person's physical health, psychological state, level of independence, social relationships, personal beliefs and relationship with the specifics of his or her environment"(12,13).

In our study, the mean age of patients was 52.8 years (± 10.2), with extremes of 32 and 91 years. Patients aged between 50 and 60 were the most represented (50%). This relative rejuvenation of stroke victims is reflected in numerous African studies. Bello et al (4), in a systematic review of twenty-eight articles on quality of life after stroke in nine African countries, reported a mean age ranging from 54 to 67.7 years. In Nigeria, Oni et al (14) and Fatoyé et al (7) found a mean age of 57.43 (± 9.67) and 60.7 (+/- 10.6) years respectively, with extremes of 38 and 87 years. The average age in other African countries falls within the range of our study, between 50 and 60 years. Gnonlonfoun et al (8), in Benin, Diagne et al, in Senegal (15), (16) Napon et al, in Burkina Faso and Dongor et al (6), in Ghana, noted respectively 55.3 ± 2.5 years; 55.25 years; 56.9 years and 58 +/- 11.4 years. The expansion and development of certain cardiovascular risk factors, led by hypertension, dyslipidemia, sedentary lifestyle and stress (17), are thought to be behind this rejuvenation of stroke victims.

Return to work was observed in 58.7% of patients in this study. The rate of return to work after stroke varies widely in the literature. Oni et al. in Nigeria found an inactivity rate among stroke survivors of 40% (14). This rate of return to work seems to be improving in some developed countries, as shown by the study by Palstam et al in Sweden (18) and that of Chen et al in China (1), where 74.5% and 79.41% of patients respectively returned to work after their stroke. The Chen et al cohort included patients who had undergone 1 month of intensive functional rehabilitation and who had a high to very high income (91.2%), unlike the patients in our study. Predictors of return to work after stroke in their study were improvement in quality of life by the fourth week post-stroke, type of stroke and type of work.

The physical and environmental domains received the lowest scores from our patients, 49.34/100 and 49.10/100 respectively. Functional autonomy, dependence on treatments, chronic complications and resumption of daily habits were the most recurrent complaints of patients, indicating their impact on QoL. In our study, the proportion of patients working in the informal sector was 60.09%. Given the average age of our patients, they were still in their productive years and were the breadwinners of their families before their stroke.

Psychosocial support and accompaniment of patients gave the psychological and relational domains relatively average quality of life scores, with 63.89/100 and 54.45/100 respectively.

In assessing quality of life, normative reference data for the general population in France exist thanks to the 2009 study by C. Baumann et al (12)

- for physical health: the average is 76.9 out of 100

- for psychological health: the average is 67 out of 100

- for social relations, the average is 74.5 out of 100

- for the environmental domain, no data are available for the French population. For economic reasons, this domain was not explored in Baumann's study.

These are therefore average values for each domain, based on the general population and independent of morbidity.

These data thus confirm a deterioration in post-stroke quality of life in our study population, across all domains.

This reflection of patients' post-stroke quality of life maintains the same trend in different studies, whatever the tool used.

Fatoyé et al. in Nigeria, in a case-control study using the WHOQOL-BREF questionnaire, found a score in the physical domain of (48.3/100) and in the environmental domain (56.3/100), 59/100 for the psychological domain and 59.1/100 for the relational domain.

Still in Nigeria, Oni et al (14) noted in their study that the physical domain had the lowest mean score of 50.56/100 (±12.63) among the various quality-of-life domains, followed by the environmental domain (50.87±10.15), the psychological domain (51.41±12.79) and the social domain (56.30±13.11).

In the USA, Lin et al (19) noted an alteration in health-related QOL in 84 (36.2%) of their patients in a study of the association between infarct location and health-related quality of life at three months in patients with mild ischemic stroke. A questionnaire different from ours was used in this study: the HRQOL (Health-Related Quality Of Life).

Various sociodemographic and clinical factors were associated with QOL. In our study, there was a statistically significant correlation between general quality of life and occupational status, place of residence and functional disability. This statistically significant correlation was observed between the different WHOQOL-BREF domains with functional disability, and occupational status. Stroke type was correlated with the physical domain, place of residence with the psychological domain, and education level and age with the relational domain.

The determinants of post-stroke QOL are manifold and vary from study to study.

Gnonlonfoun et al. in Benin (8) found that age, support from other family members, type of stroke and speech therapy were determinants of post-stroke QOL.

Donkor et al in Ghana (6) found age, stroke severity, time post-stroke, negative emotions and laughter to be determinants of quality of life using the HRQOL questionnaire.

In Nigeria, Fatoyé et al (7) found that prior psychiatric illness, paresis, low education and shorter time after stroke were associated with quality of life in stroke survivors.

Howitt et al. in Tanzania (9) identified advanced patient age, disability, severe anxiety, severe depression and less involvement in social events as determinants of post-stroke patients' QoL.

In a cohort in Kenya, Muli et al(11) reported that age, depression, anxiety, disability, motor function and involvement in social events were associated with low HRQOL in stroke survivors.

In South Africa, Kusambiza-Kiingi et al found a correlation between community reintegration and QoL (20). Their study examined 108 stroke survivors' levels of community reintegration, quality of life, satisfaction with physiotherapy services and level of caregiver strain in Johannesburg health centers.

In Germany, a multivariate analysis by Konigsberg et al,(10) revealed an association between corticospinal tract lesions and QOL, 90 days post-stroke for stroke lesions of comparable size.

In Brazil, (21) Ramos-Lima et al. identified stroke severity, anterior cerebral artery involvement, NIHSS score, disability and orthosis use as determinants of QOL. The QOL questionnaire used was the SSQOL.

Khalid et al. in Pakistan (22), in their cohort, found that functional disability, depression, hospital a Finally, for Lin et al in the USA (19), patients with subcortical infarcts and brainstem infarcts were more likely to have impaired health-related HRQoL. In multivariate analysis, patients with subcortical and/or brainstem infarcts had an increased likelihood of health-related QOL impairment.

Although functional disability and depression are the determinants of post-stroke QOL in most of these studies, many other factors also have an impact on post-stroke quality of life. Their adverse effect is multiplied when they are combined in the same patient.

**CONCLUSION**

Stroke is a real scourge, not only because of its morbidity and mortality, but also because of its functional sequelae, all of which have a definite impact on patients' quality of life. In this study, we used the WHOQOL scale to assess quality of life three months after a stroke in patients seen for consultation. Physical and environmental domains were the most impaired. Functional disability and socio-professional status were the main factors associated with post-stroke QOL. A comprehensive, early neurorehabilitation program with an increased focus on preventing depressive disorders could improve the QoL of stroke victims of stroke survivors. The present work is a plea to encourage and improve the policy of comprehensive care for stroke survivors beyond the control of risk factors and physical deficits. QOL is a trend that deserves to be explored further, particularly in the aftermath of pathological deficits such as stroke.

**Ethical approval :**

We obtained a collection authorization from the Director General of Bogodogo University Hospital.

**DISCLAIMER (ARTIFICIAL INTELLIGENCE)**

Author(s) hereby declare that NO generative AI technologies such as Large Language Models (ChatGPT, COPILOT, etc) and text-to-image generators have been used during writing or editing of manuscripts.

**References**

1. Chen Q, Cao C, Gong L, Zhang Y. Health related quality of life in stroke patients and risk factors associated with patients for return to work. Medicine (Baltimore). 2019 Apr;98(16):e15130. doi: 10.1097/MD.0000000000015130. PMID: 31008934; PMCID: PMC6494282.

2. Katan M, Luft A. Global Burden of Stroke. Semin Neurol. 2018 Apr;38(2):208-211. doi: 10.1055/s-0038-1649503. Epub 2018 May 23. PMID: 29791947.

3. Laurent K, De Sèze MP, Delleci C, Koleck M, Dehail P, Orgogozo JM, Mazaux JM. Assessment of quality of life in stroke patients with hemiplegia. Ann Phys Rehabil Med. 2011 Sep;54(6):376-90. English, French. doi: 10.1016/j.rehab.2011.06.002. Epub 2011 Aug 5. PMID: 21855441.

4. Bello UM, Chutiyami M, Salihu D, Abdu SI, Tafida BA, Jabbo AA, Gamawa A, Umar L, Lawan A, Miller T, Winser SJ. Quality of life of stroke survivors in Africa: a systematic review and meta-analysis. Qual Life Res. 2021 Jan;30(1):1-19. doi: 10.1007/s11136-020-02591-6. Epub 2020 Jul 25. PMID: 32712933.

5. Duncan F, Wu S, Mead GE. Frequency and natural history of fatigue after stroke: a systematic review of longitudinal studies. J Psychosom Res. 2012 Jul;73(1):18-27. doi: 10.1016/j.jpsychores.2012.04.001. Epub 2012 Apr 29. PMID: 22691555.

6. Donkor ES, Owolabi MO, Bampoh PO, Amoo PK, Aspelund T, Gudnason V. Profile and health-related quality of life of Ghanaian stroke survivors. Clin Interv Aging. 2014 Oct 8;9:1701-8. doi: 10.2147/CIA.S62371. PMID: 25336935; PMCID: PMC4199965.

7. Fatoye FO, Komolafe MA, Eegunranti BA, Adewuya AO, Mosaku SK, Fatoye GK. Cognitive impairment and quality of life among stroke survivors in Nigeria. Psychol Rep. 2007 Jun;100(3 Pt 1):876-82. doi: 10.2466/pr0.100.3.876-882. PMID: 17688106.

8. Gnonlonfoun D, Adjien C, Ossou-Nguiet PM, Mapoure Y, Sissoko A, Wouton G, Kpadonou T, Houinato D, Avode DG. Facteurs associes a la qualite de vie des aphasiques post accident vasculaire cerebral en milieu hospitalier a cotonou, Benin [Factors associated with quality of life for patients with post-stroke aphasia in the Cotonou hospitals, Benin]. Mali Med. 2017;32(2):32-40. French. PMID: 30079667.

9. Howitt SC, Jones MP, Jusabani A, Gray WK, Aris E, Mugusi F, Swai M, Walker RW. A cross-sectional study of quality of life in incident stroke survivors in rural northern Tanzania. J Neurol. 2011 Aug;258(8):1422-30. doi: 10.1007/s00415-011-5948-6. Epub 2011 Feb 19. PMID: 21336782.

10. Königsberg, A., DeMarco, A.T., Mayer, C. et al. Influence of stroke infarct location on quality of life assessed in a multivariate lesion-symptom mapping study. Sci Rep 11, 13490 (2021). https://doi.org/10.1038/s41598-021-92865-x

11. Muli G, Rhoda A. Quality of life amongst young adults with stroke living in Kenya. Afr Health Sci. 2013 Sep;13(3):632-8. doi: 10.4314/ahs.v13i3.16. PMID: 24250300; PMCID: PMC3824418.

12. Baumann C, Erpelding ML, Régat S, Collin JF, Briançon S. The WHOQOL-BREF questionnaire: French adult population norms for the physical health, psychological health and social relationship dimensions. Rev Epidemiol Sante Publique. 2010 Feb;58(1):33-9. doi: 10.1016/j.respe.2009.10.009. Epub 2010 Jan 21. PMID: 20096515.

13. Skevington SM, Lotfy M, O'Connell KA; WHOQOL Group. The World Health Organization's WHOQOL-BREF quality of life assessment: psychometric properties and results of the international field trial. A report from the WHOQOL group. Qual Life Res. 2004 Mar;13(2):299-310. doi: 10.1023/B:QURE.0000018486.91360.00. PMID: 15085902.

14. Oni OD, Aina OF, Ojini FI, Olisah VO. Quality of life and associated factors among poststroke clinic attendees at a University Teaching Hospital in Nigeria. Niger Med J. 2016 Sep-Oct;57(5):290-298. doi: 10.4103/0300-1652.190602. PMID: 27833249; PMCID: PMC5036301.

15. N.S. Diagne, M. Camara, O. Cisse, A. Sy, A. Diop, N.M. Gaye, A.M. Basse, A. Sow, M.S. Diop, M. Ndiaye, A.G. Diop, M.M. Ndiaye. Vécu post-AVC d’une cohorte sénégalaise : quel facteur de risque pour quel items de qualité de vie. Journal de Réadaptation Médicale : Pratique et Formation en Médecine Physique et de Réadaptation,Volume 36, Issue 3, 2016, Pages 156-160, ISSN 0242-648X, https://doi.org/10.1016/j.jrm.2016.07.001.

16. Napon C, Kaboré A, Kaboré J. La dépression post-accident vasculaire cérébral au Burkina Faso [Post stroke depression in Burkina Faso]. Pan Afr Med J. 2012;13:3. French. Epub 2012 Sep 3. PMID: 23319139; PMCID: PMC3527021.

17. Ido BJF, Bamogo WFR, Dabilgou AA, Napon C, Kabore BJ. Facteurs de risque et etiologies des avc de l'adulte jeune au chu de Bogodogo a Ouagadougou [Risk factors and aetiologies of stroke in young adults in Bogodogo university hospital, Ouagadougou]. Mali Med. 2022;37(3):50-53. French. PMID: 38514952.

18. Palstam A, Westerlind E, Persson HC, Sunnerhagen KS. Work-related predictors for return to work after stroke. Acta Neurol Scand. 2019 Apr;139(4):382-388. doi: 10.1111/ane.13067. Epub 2019 Feb 6. PMID: 30657175; PMCID: PMC6617971.

19. Lin C, Sangha R, Lee J, Corado C, Jalasutram A, Chatterjee N, Ingo C, Carroll T, Prabhakaran S. Infarct location is associated with quality of life after mild ischemic stroke. Int J Stroke. 2018 Oct ;13(8):824-831. doi: 10.1177/1747493018783760. Epub 2018 Jun 29. PMID : 29956592 ; PMCID : PMC6322543.

20. Kusambiza-Kiingi, A., Maleka, D. & Ntsiea, V., 2017, ‘Stroke survivors’ levels of community reintegraton, quality of life, satsfacton with the physiotherapy services and the level of caregiver strain at community health centres within the Johannesburg area’, African Journal of Disability 6(0), a296. htps://doi.org/10.4102/ajod.v6i0.296

21. Davide B, Agostino B, Andrea G, Rosaria A, Ercole V, Gianluca P. Stroke disease–specific quality of life trajectories and their associations with caregivers’ anxiety, depression, and burden in stroke population : a longitudinal, multicentre study. European Journal of Cardiovascular Nursing March 2024 ;23(2) : 160–168. https://doi.org/10.1093/eurjcn/zvad054

22. Ramos-Lima MJM, Brasileiro IC, Lima TL, Braga-Neto P. Quality of life after stroke: impact of clinical and sociodemographic factors. Clinics (Sao Paulo). 2018 Oct 8;73:e418. doi: 10.6061/clinics/2017/e418. PMID: 30304300; PMCID: PMC6152181.

23. Khalid W, Rozi S, Ali TS, Azam I, Mullen MT, Illyas S, Un-Nisa Q, Soomro N, Kamal AK. Quality of life after stroke in Pakistan. BMC Neurol. 2016 Dec 3;16(1):250. doi: 10.1186/s12883-016-0774-1. PMID: 27912744; PMCID: PMC5135839.