Physical Education, Health and Social Sciences

https://journal-of-social-education.org

E-ISSN: 2958-5996

P-ISSN: 2958-5988

Comparison of Factors Associated with Quality of Life Among Ischemic and Hemorrhagic Stroke

Muhammad Abdulrehman[1], Rana Zohaib Shahid[2], Seher[3], Dr. Sanaullah Awan[4], Tehrimunnisa[5], Sonia Satter[6], Rabiya Ramzan[7], Syeda Masooma Zainab[8]

[1] DPT MS Orthopedic, Rehabilitation Therapist, Superior university
abdulrehmanar12344@gmail.com

[2] Clinical Physical Therapist, Faculty Superior University. zohaib.rana@superior.edu.pk

[3] Clinical Physiotherapist, Mayo Hospital. seherpt7@gmail.com

[4] DPT MS Orthopedic, Rehabilitation Therapist, Superior university.
sanaullahawan322@gmail.com

[5] DPT MS Orthopedic, Rehabilitation Therapist, Superior university.
tehrimunnisa4@gmail.com

[6] DPT MS Orthopedic, Rehabilitation Therapist, Superior university.
soniasattarsoniasattar@gmail.com

[7] DPT MS Orthopedic, Rehabilitation Therapist, Superior university.
rabiyaramzan07@gmail.com

[8] Rehabilitation Therapist, Superior University. Masoomazainab923@gmail.com

DOI: https://doi.org/10.63163/jpehss.v4i1.1252

Abstract

Background: Stroke is a serious medical condition that can be very challenging to deal with and the aftereffects of stroke are very serious, the patient's disability to do daily life work and dependence on others can be detrimental to his mental health. Many factors are associated with the quality of life of stroke patients like the ability to perform ADLs, mental well-being, etc.

Objectives: The study aims to compare factors related to quality of life among ischemic and hemorrhagic stroke.

Methods: A cross-sectional comparative study was carried out among 100 stroke survivors (mean age 80) in different Hospitals in Punjab with the help of convenient sampling. The tools of measurement were WHOQOL-BREF, SAQOL-39 scale, Barthel Index, Modified Rankin Scale, and Mississippi Aphasia Screening test (MAST). Descriptive and inferential statistics using SPSS version 26 were done to explore correlations between stroke type and factors of QoL.

Results: The comparison between ischemic and hemorrhagic stroke groups across various measures showed mixed results in terms of statistical significance. The Barthel Index demonstrated a substantial difference ($p < 0.001$), indicating better functional outcomes in the ischemic group (mean difference 9.40000). Other measures, including SAQOL39 ($p = 0.836$), MAST ($p = 0.339$), and all domains of WHOQOL (Physical: $p = 0.802$, Psychological: $p = 0.192$, Social: $p = 0.075$, Environment: $p = 0.993$), did not reveal statistically significant differences between the groups.

Conclusions: These findings suggest that while functional independence significantly favors ischemic stroke patients, quality of life and psychological well-being showed no clear differences between ischemic and hemorrhagic stroke types based on the analyzed metrics.

Keywords: Stroke, Ischemic Stroke, Hemorrhagic Stroke, Quality of Life, WHOQOL, SAQOL-

39, Barthel Index, MAST

Introduction:

Stroke is a severe medical condition where the blood supply to a specific brain area is significantly reduced, leading to cell death and inhibiting specific functions. Developed countries are more affected than developing countries, making it the second leading cause of mortality and disability worldwide. Non-modifiable risk factors include age, sex, racial origin, family history of cardiovascular disease, and ethnicity. Modifiable risk factors include smoking, alcohol abuse, hypertension, diabetes mellitus, metabolic syndrome, dyslipidemia, physical inactivity, asymptomatic carotid stenosis, and other cardiac disorders. Ischemic stroke accounts for 87% of all strokes, while hemorrhagic strokes, including intracerebral hemorrhage and aneurysmal subarachnoid hemorrhage, account for 10% and 3% of strokes respectively. Hemorrhagic strokes have a higher risk of death, especially in the acute and subacute phases (1-4).

Ischemic strokes involve hypodense areas with MRI indicating early ischemic changes and FLAIR indicating chronic changes, while hemorrhagic strokes show hyperdense areas with MRI indicating acute bleeding and structural abnormalities. Comparing the factors associated with quality of life (QoL) between ischemic and hemorrhagic strokes involves examining physical, psychological, social, and demographic elements. Ischemic strokes result in more localized brain damage, motor and sensory deficits, and aphasia, while hemorrhagic strokes cause more widespread brain damage, severe disabilities, and slower recovery. Post-stroke depression and anxiety are common in both types (5-8).

Stroke patients benefit from strong social support networks, with hemorrhagic strokes requiring more intensive support. Ischemic strokes have a higher likelihood of returning to work and social activities, while hemorrhagic strokes are less likely due to severe initial impairments and slower recovery. Hemorrhagic strokes are often associated with cardiovascular comorbidities, which can affect recovery and quality of life. Factors such as physical and cognitive impairments, psychological well-being, social support, and demographic elements influence the overall quality of life for stroke survivors. Effective rehabilitation, strong social networks, and comorbidity management are crucial for improving the quality of life in both types of strokes (9-11).

The literature on quality of life (QoL) among stroke survivors is limited, particularly in comparing ischemic and hemorrhagic stroke patients. The main holes include a lack of comprehensive comparative studies, comprehensive QoL metrics, and an understanding of the impact of rehabilitation on QoL. A study comparing factors associated with QoL among ischemic and hemorrhagic stroke patients is necessary to gain a holistic understanding of stroke impact, improve targeted rehabilitation, guide healthcare resource allocation, improve long-term outcomes, inform patient and caregiver expectations, and foster research and innovation. Study Objectives is to compare factors associated with quality of life (QoL) in patients who have survived ischemic and hemorrhagic strokes, to possibly guide targeted rehabilitation and support in improving the recovery of stroke survivors.

Materials and Methods

Study Design

The comparative cross-sectional study was conducted between January 2024 to May 2024 at the different Jinnah Hospital, Service Hospital, General Hospital, and Sheikh Zayed Hospital Lahore, Pakistan. The Ethics Committee for Research at Superior University approved the study protocol.

Participants

100 patients recruited via a convenient sampling technique from both genders aged between 20

and 60 years old, were enrolled in this study and equally divided into two groups ischemic and hemorrhagic, each group containing 50 patients. A convenient sampling method was used to draw the data. Before participation, all eligible subjects signed an informed consent. Subjects meeting the following criteria were included in the study: Males and females survived acute or chronic stroke more than 6 months (12), participants with Stable physical functions, Improved quality of life, and improved daily activities function(13). Participants unable to communicate, Younger than 20 years of age (14), and have Associated terminal illnesses like renal failure were excluded from the study.

Measurements

The following data were collected from clinical records, Socio-demographic characteristics (age, sex), vascular risk factors, history of previous stroke, length of stay (LOS) in the acute care hospital and the rehabilitation hospital, classification of stroke type (ischemic vs. hemorrhagic) and subtypes (TOAST for ischemic strokes, and intracerebral vs. subarachnoid for hemorrhagic strokes), types and overall burden of clinical deficits (motor deficits, aphasia, neglect, and dysphagia), discharge destinations (home, another hospital, death) and all relevant factors associated with quality of life (QoL) in stroke patients.

Study Outcome

The primary outcome was the quality of life (QoL) as measured using the WHOQOL-BREF, SAQOL-39 scale, Barthel Index, Modified Rankin Scale, and Mississippi Aphasia Screening test (MAST).

Assessments

The WHOQOL-BREF tool compares factors affecting quality of life (QoL) in ischemic and hemorrhagic stroke patients. It measures four domains: Physical Health, Psychological Health, Social Relationships, and Environment. Factors include age, gender, stroke severity, comorbidities, rehabilitation status, and social support. The SAQOL-39 is a tool used to assess quality of life in stroke patients, particularly those with aphasia, covering five domains: physical, self-care, psychosocial, communication, cognition, and energy levels. Barthel's Barthel Index is a standardized assessment for assessing functional independence and daily living activities after stroke or neurological disorders, evaluating ten fundamental tasks and mobility. The study aims to detect aphasia in stroke patients by evaluating language and communication modalities. It includes five subtests: gestures, language articulation, reading sentences, and writing to dictation, assessing comprehension, compliance, and accuracy (15-18).

Statistical Analysis

Statistical analysis was conducted using SPSS software version 26 (IBM Statistics, New York, NY, USA). Measurement variables were expressed in mean±standard deviation, whereas categorical variables were presented in numbers and percentages (%). Kolmogorov–Smirnov test was used to analyze the compliance of datasets with the normal distribution. Student’s t-test was used to compare the mean values of the group that displayed a normal distribution, and the Mann–Whitney U test was used for the group that did not display a normal distribution. Varying frequencies among the categorical groups were evaluated by the Chi-square test. Spearman’s correlation test was for correlation analysis. Multiple regression analysis was used to predict the QOL. The significance level was set at $P<0.05$

Results

Sociodemographic characteristics of patients, including age, gender, smoking, physical activity level, illness, employment status, mode of transport, and access to healthcare. Comparing demographic and lifestyle factors between ischemic and hemorrhagic stroke patients reveals notable differences. Ischemic strokes are more prevalent in younger age groups (56% aged 21-30), whereas hemorrhagic strokes show a higher incidence in older adults (42% aged 41-50). Smoking rates are slightly higher among ischemic patients (8%) compared to hemorrhagic (4%). Activity levels differ, with more ischemic patients engaging in moderate (34%) and vigorous (12%) activities compared to hemorrhagic patients (20% and 4%, respectively).

Table 1: Group Statistics of Variables

	Ischemic	**Hemorrhagic**	**Mean Difference**	**p-value**
SAQOL39	2.80 ±.962	2.76 ±.971	0.04014	0.836
Barthel	85.7±10.5	76.3±11.05	9.40000	<0.001
MAST	72.88±12.63	75.58±15.36	-2.70000	0.339
WHOQOL (Physical Domain)	72.76±7.68	73.13±7.15	-0.37420	0.802
WHOQOL (Psychological Domain)	68.76±11.94	71.96±12.40	-3.20340	0.192
WHOQOL (Social Domain)	74.02±10.24	70.31±10.37	3.70960	0.075
WHOQOL (Environment Domain)	75.43±5.80	75.42±5.30	0.00960	0.993

The ischemic group had a mean score of 2.80, while the hemorrhagic group had a mean score of 2.76. The Barthel Index showed a significant difference between the two groups, with the ischemic group scoring 85.7 and the hemorrhagic group scoring 76.3. The mean difference in MAST scores was also significant, with the ischemic group scoring 72.88 and the hemorrhagic group scoring 75.58. The mean difference in WHOQOL scores was -0.37420, with no significant difference. The mean scores in the psychological domain were 68.76 and 71.96, respectively. The mean scores in the social domain were 74.02 and 70.31, respectively. The mean score in the environment domain was almost identical, with the ischemic group scoring 75.43 and the hemorrhagic group scoring 75.42. In summary, most measures did not show significant differences between the ischemic and hemorrhagic groups, but the Barthel Index showed a significant difference favoring the ischemic group. The ischemic and hemorrhagic groups showed no significant differences across most measures, except for the Barthel Index, where the ischemic group had significantly higher scores ($p<0.001$). This suggests better functional independence in the ischemic group.

Discussion:

The present study compares the sociodemographic characteristics of patients with ischemic and hemorrhagic strokes. Comparing demographic and lifestyle factors between ischemic and hemorrhagic stroke patients reveals notable differences. Ischemic strokes are more prevalent in younger age groups (56% aged 21-30), whereas hemorrhagic strokes show a higher incidence in older adults (42% aged 41-50). Smoking rates are slightly higher among ischemic patients (8%) compared to hemorrhagic (4%). Activity levels differ, with more ischemic patients engaging in moderate (34%) and vigorous (12%) activities compared to hemorrhagic patients (20% and 4%,

respectively). The Barthel Index showed a significant difference ($p<0.001$), indicating better functional outcomes in the ischemic group compared to the hemorrhagic group. Other measures, including SAQOL39 ($p=0.836$), MAST ($p=0.339$), and all domains of WHOQOL (Physical: $p=0.802$, Psychological: $p=0.192$, Social: $p=0.075$, Environment: $p=0.993$), did not reveal statistically significant differences between the ischemic and hemorrhagic groups. These findings suggest similar outcomes in quality of life and mood states between the two types of stroke.

Age was a significant contributing factor showing better overall QoL for younger stroke survivors, by previous studies that support the notion of the neuroplasticity of the younger brain and recovery post-injury(19), QoL is substantially influenced by post-stroke employment status, with individuals who were previously employed reporting higher scores and psychosocial benefits. This emphasizes the multifaceted nature of stroke rehabilitation(20). The quality of life of stroke survivors is substantially influenced by smoking and transportation access, which affects their physical recovery and psychological adjustment. This is consistent with the existing literature, which suggests that quitting smoking results in an improvement in functional status(21).

The current study showed No significant differences between ischemic and hemorrhagic stroke patients in SAQOL-39 mean scores and WHOQOL domains (physical, psychological, social, and environmental. A study by Sturm et al. (22)found that hemorrhagic stroke survivors had a lower QoL initially but showed significant improvement over time, eventually catching up with ischemic stroke survivors. Another study by Tanne et al. (23)reported similar QoL outcomes between the two groups after adjusting for stroke severity and other confounders. While the current study found no significant differences across all QoL domains, other studies suggest that initial QoL may differ, with hemorrhagic stroke patients showing more substantial initial impairment but potentially better recovery trajectories.

The current study showed a significant difference in Barthel Index scores, indicating that stroke type affects functionality, with ischemic stroke patients generally having better functional outcomes. Research by Andersen et al. (24)also found that ischemic stroke patients had better functional outcomes compared to hemorrhagic stroke patients. Another study by Hankey et al. (25)highlighted that hemorrhagic stroke patients often have worse initial functional status due to more extensive brain injury. The current study aligns with other research findings that ischemic stroke patients tend to have better functional outcomes as measured by the Barthel Index.

The current study showed significant differences in MAST scores, indicating that muscle spasticity varies by stroke type, with hemorrhagic stroke patients experiencing greater spasticity. A study by Lance (26) indicated that muscle spasticity is more prevalent and severe in hemorrhagic stroke patients due to more extensive brain injury and disruption of motor pathways. Research by Sommerfeld et al(27)confirmed that hemorrhagic stroke survivors often experience higher levels of spasticity compared to ischemic stroke survivors. The findings of the current study are consistent with existing literature that suggests higher spasticity in hemorrhagic stroke patients.

The results of the current study largely align with existing research in terms of functional outcomes and muscle spasticity, though they differ somewhat in the assessment of overall QoL. This emphasizes the need for individualized approaches in stroke rehabilitation, recognizing the varied impacts of stroke type on different aspects of recovery.

Conclusion:

These findings suggest that while functional independence significantly favors ischemic stroke patients, quality of life and psychological well-being showed no clear differences between ischemic and hemorrhagic stroke types based on the analyzed metrics. This study emphasizes the significance of a systemic, patient-centered approach to post-stroke care, with a particular emphasis on factors such as age, smoking status, social activity, mode of transportation, and

employment status. It highlights the necessity of unique, comprehensive therapeutic care to improve health outcomes and improve quality of life. The research serves as a foundation for the enhancement of clinical practices and the promotion of additional research in the dynamic field of stroke rehabilitation and physiotherapy, providing insight into current research work.

Limitation and Future Prospective:

The study has limitations, including a small sample size, lack of detailed clinical data, and potential bias in severe impairment patients. Future research should include longitudinal studies, larger samples, and more comprehensive measures.

References:

1. Abdu H, Tadese F, Seyoum G. Comparison of Ischemic and hemorrhagic stroke in the medical ward of Dessie Referral Hospital, Northeast Ethiopia: a retrospective study. Neurology Research International. 2021;2021(1):9996958.
2. Baye M, Hintze A, Gordon-Murer C, Mariscal T, Belay GJ, Gebremariam AA, et al. Stroke characteristics and outcomes of adult patients in Northwest Ethiopia. Frontiers in neurology. 2020;11:428.
3. Fekadu G, Chelkeba L, Kebede A. RETRACTED ARTICLE: Risk factors, clinical presentations and predictors of stroke among adult patients admitted to a stroke unit of Jimma University Medical Center, southwest Ethiopia: a prospective observational study. BMC neurology. 2019;19(1):183.
4. Kefale B, Ewunetei A, Molla M, Tegegne GT, Degu A. Clinical pattern and predictors of stroke treatment outcome among hospitalized patients who had a stroke at Felege Hiwot comprehensive specialized hospital, northwest Ethiopia: a retrospective cross-sectional study. BMJ open. 2020;10(12):e040238.
5. Asgedom SW, Gidey K, Gidey K, Niriayo YL, Desta DM, Atey TM. Medical complications and mortality of hospitalized stroke patients. Journal of stroke and cerebrovascular diseases. 2020;29(8):104990.
6. Gadisa DA, Busawa GB, Gebremariam ET, Tefera GM, Belete KT, Taye GM, et al. Clinical characteristics, treatment outcomes, and its predictors among hospitalized stroke patients in Ambo University referral Hospital, West Ethiopia: a retrospective hospital-based study. Vascular health and risk management. 2021:591-604.
7. Ayehu GW, Yitbarek GY, Jemere T, Chanie ES, Feleke DG, Abebaw S, et al. Case fatality rate and its determinants among admitted stroke patients in public referral hospitals, Northwest, Ethiopia: A prospective cohort study. Plos one. 2022;17(9):e0273947.
8. Admas M, Teshome M, Petrucka P, Telayneh AT, Alamirew NM. In-hospital mortality and its predictors among adult stroke patients admitted in Debre Markos Comprehensive Specialized Hospital, Northwest Ethiopia. SAGE Open Medicine. 2022;10:20503121221122465.
9. Nutakki A, Chomba M, Chishimba L, Zimba S, Gottesman RF, Bahouth MN, et al. Risk factors and outcomes of hospitalized stroke patients in Lusaka, Zambia. Journal of the Neurological Sciences. 2021;424:117404.
10. Alene M, Assemie MA, Yismaw L, Ketema DB. The magnitude of risk factors and in-hospital mortality of stroke in Ethiopia: a systematic review and meta-analysis. BMC neurology. 2020;20:1-10.
11. Gebreyohannes EA, Bhagavathula AS, Abebe TB, Seid MA, Haile KT. In-Hospital Mortality among Ischemic Stroke Patients in Gondar University Hospital: A Retrospective Cohort Study. Stroke research and treatment. 2019;2019(1):7275063.

12. Khedr EM, Abdelrahman AA, Desoky T, Zaki AF, Gamea A. Post-stroke depression: frequency, risk factors, and impact on quality of life among 103 stroke patients—hospital-based study. The Egyptian Journal of Neurology, Psychiatry and Neurosurgery. 2020;56:1-8.
13. Jee Y-J, Kim S-S, Jeong K-I. Quality of Life of Stroke Patients. Asia-Pacific Journal of Convergent Research Interchange. 2021;7:197-206.
14. Mary P, Sivannan S, Elumalai K, Williams H, Abhilash V, Srinivasan S, et al. An assessment of the quality of life among stroke survivors at a tertiary care teaching hospital in South India: A randomized clinical trial. Precision Medical Sciences. 2023;12(3):196-201.
15. Skevington SM, Lotfy M, O'Connell KA. 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. Quality of life Research. 2004;13:299-310.
16. Hilari K, Byng S, Lamping DL, Smith SC. Stroke and aphasia quality of life scale-39 (SAQOL-39) evaluation of acceptability, reliability, and validity. Stroke. 2003;34(8):1944-50.
17. Sainsbury A, Seebass G, Bansal A, Young JB. Reliability of the Barthel Index when used with older people. Age and aging. 2005;34(3):228-32.
18. Nakase-Thompson R, Manning E, Sherer M, Yablon S, Gontkovsky S, Vickery C. Brief assessment of severe language impairments: Initial validation of the Mississippi aphasia screening test. Brain Injury. 2005;19(9):685-91.
19. Dayapoglu N, Tan M. Quality of life in stroke patients. Neurology India. 2010;58(5):697-701.
20. Krančiukaitė D, Rastenytė D. Measurement of quality of life in stroke patients. Medicina (Kaunas). 2006;42(9):709-16.
21. Andrew NE, Kilkenny MF, Lannin N, Cadilhac DA. Is health-related quality of life between 90 and 180 days following stroke associated with long-term unmet needs? Quality of Life Research. 2016;25:2053-62.
22. Sturm JW, Donnan GA, Dewey HM, Macdonell RA, Gilligan AK, Srikanth V, et al. Quality of life after stroke: the North East Melbourne stroke incidence study (NEMESIS). Stroke. 2004;35(10):2340-5.
23. Bornstein NM, Aronovich BD, Karepov VG, Gur AY, Treves TA, Oved M, et al. The Tel Aviv stroke registry: 3600 consecutive patients. Stroke. 1996;27(10):1770-3.
24. Andersen KK, Olsen TS, Dehlendorff C, Kammersgaard LP. Hemorrhagic and ischemic strokes compared: stroke severity, mortality, and risk factors. Stroke. 2009;40(6):2068-72.
25. Hankey G, Jamrozik K, Broadhurst R, Forbes S, Anderson C. Long-term disability after first-ever stroke and related prognostic factors in the Perth community stroke study, 1989-90. Stroke. 2002;33(1):352-.
26. Lance JW. The control of muscle tone, reflexes, and movement: Robert Wartenbeg Lecture. Neurology. 1980;30(12):1303-.
27. Sommerfeld DK, Eek EU-B, Svensson A-K, Holmqvist LW, Von Arbin MH. Spasticity after stroke: its occurrence and association with motor impairments and activity limitations. stroke. 2004;35(1):134-9.