Factors influencing stroke outcomes and the experiences of healthcare workers managing stroke patients in a South African hospital: A protocol for a mixed-methods study

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Background. Stroke, also known as cerebrovascular accident, is the second leading cause of death and a significant contributor to disability on a global scale. Stroke presents an important healthcare challenge in South Africa (SA), standing as the second most common cause of death after HIV/AIDS. However, there is a lack of comprehensive epidemiological data and research on the experiences of healthcare professionals in managing stroke patients in low- and middle-income countries such as SA.
Objectives. To describe the profiles of and factors affecting outcomes for stroke patients admitted to Steve Biko Academic Hospital, Pretoria, SA, and explore the experiences of healthcare professionals managing these patients.
Methods. The study will employ a mixed-methods approach, combining quantitative and qualitative methods. It will describe factors influencing outcomes for stroke patients at the hospital, utilising quantitative data analysis. Additionally, it will capture healthcare workers' experiences through qualitative insights into their challenges and successes. Data will be gathered via REDCap forms for quantitative measures and through semi-structured interviews for qualitative information. Analysis will include descriptive statistics, logistic regression for variable relationships, and thematic analysis for qualitative patterns.
Conclusions. This research aims to improve understanding of stroke management and the impact of a stroke unit at a central hospital.

Keywords. Stroke, healthcare workers, South African hospital, mixed-methods study

South Afr J Pub Health 2025;8(2):e2911. https://doi.org/10.7196/SHS.2025.v8i2.2911

Stroke, also referred to as cerebrovascular accident, ranks as the second leading cause of death and significantly contributes to disability on a global scale.[1] In 2015, stroke resulted in 6.33 million deaths and 118 million disability-adjusted life-years.[2] Between 1990 and 2013, there was a notable increase in the prevalence of stroke among adults aged 20 - 40 years on a global scale.[3] This rise poses a significant economic burden owing to the increased demand for extensive healthcare and rehabilitation services. In South Africa (SA), stroke is the second most prevalent cause of mortality following HIV/AIDS, and it significantly contributes to morbidity.[4-7] An estimated 75 000 individuals suffer from a stroke annually in SA, leading to 564 000 stroke-related disability-adjusted life-years.[8] Stroke is largely preventable and is associated with modifiable risk factors.[9] Stroke risk factors that can be modified include smoking, hypertension, obesity, physical inactivity, low intake of fruits and vegetables, diabetes, alcohol consumption and high cholesterol.[9] A study by Ntaios *et al.*[10] identified six factors influencing stroke outcomes at 3 months. These were age, admission National Institutes of Health Stroke Scale, blood glucose level on admission, level of consciousness, range of visual field, and stroke onset to admission time. The 2018 United Nations high-level meeting on non-communicable diseases (NCDs) emphasised the critical need for a global response to NCDs, including stroke, to achieve the Sustainable Development Goal of reducing NCD-related morbidity and mortality by 25% by 2025.[11-13] Reliable data on stroke epidemiology, especially population-representative data on stroke incidence, which are essential for comprehensive burden of disease analysis, are lacking. Missing epidemiological parameters, particularly incidence and case fatality, and predictors of good functional outcomes could be derived from such studies

and enable an improved understanding of stroke epidemiology in different geographical areas.[7] There are limited data on research examining the viewpoints of healthcare service providers who treat stroke patients, which are also necessary.[14]

Objectives

This study aims to describe the profiles of and factors affecting outcomes for stroke patients admitted to Steve Biko Academic Hospital (SBAH), Pretoria, SA, and to explore the experiences of healthcare professionals managing these patients.

Methods

The study will utilise a mixed-methods approach, incorporating quantitative (analytical cross-sectional) and qualitative (phenomenological) methodologies to comprehensively understand stroke patient profiles, outcomes, and healthcare professionals' experiences of treating these patients. The study will be conducted at SBAH, a central hospital in Pretoria. It may be transferrable to other hospitals with experiences of managing stroke patients.

For the quantitative component, records of patients (aged ≥18 years) admitted with a stroke diagnosis confirmed by computed tomography scans will be included. Only patients with an intracranial infarct will be included. Patients with haemorrhagic stroke will be excluded owing to different aetiopathology. Patients (sample size *N*=150) must have been admitted to the hospital and had a separation outcome between January 2024 and June 2024.

For the qualitative component, healthcare workers involved in treating stroke patients at SBAH, including doctors and registered nurses from the emergency and neurology departments, as well as clinical support and therapeutic services staff such as physiotherapists, occupational therapists and speech therapists, will be interviewed, with a sample size of 11. The interviews will continue until data saturation is achieved. All these staff members must be permanent employees of the hospital, with an employment history of >1 year. Their identities will be anonymised to ensure confidentiality during data collection, analysis and report writing.

Data collection

The data for this study will be collected using REDCap (Research Electronic Data Capture, an online database manager) forms for structured quantitative data from patient records. Healthcare workers will be interviewed to explore their experiences and challenges in managing stroke patients. Before the interview, participants will receive a summarised information sheet based on the South African Stroke Society guidelines for level 3 facilities.[9] The credibility of findings will be enhanced by an audit trail and additional reviewers.

Data analysis

Descriptive statistics (means, standard deviations, medians, interquartile ranges) will summarise demographic and clinical characteristics, while frequencies and proportions will be calculated for categorical variables. Logistic regression analysis will identify determinants of stroke outcomes based on the modified Rankin score (mRS) (favourable ≤2, unfavourable >2). An initial univariate analysis will determine statistically significant predictors for the final regression model. The primary outcome will be the mRS score on hospital separation, with reported adjusted odds ratios and 95% confidence intervals. A likelihood ratio test will enhance model accuracy, with *p*-values <0.05 considered significant. Data analysis will use Stata 18 (StataCorp, USA). Data will be transcribed into English and reviewed against original recordings for accuracy, then sent to participants for verification. Using ATLAS.ti (ATLAS.ti Scientific Software Development GmbH, Germany) for coding, an inductive thematic analysis will follow Braun *et al.*'s[15] six phases. Open and list coding will be performed based on participant descriptions, followed by a second cycle to identify themes, reviewed for consistency by a supervisor.

Ethics approval

The study has been approved by the University of Pretoria Human Research Ethics Committee (ref. no. 523/2024).

Discussion

This study will give valuable insights into the profiles of and factors affecting outcomes for stroke patients admitted to SBAH and explore healthcare professionals' experiences managing these patients.

Conclusion

The results from this study will aid clinicians in understanding essential determinants of stroke outcomes and the impact of a stroke unit at a central hospital.

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Received 13 March 2025. Accepted 15 August 2025.