Determinants of quality of life in patients with hemorrhagic stroke, Saudi Arabia: A cross-sectional study

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ABSTRACT

Background: Previous studies demonstrated that stroke had an inverse impact on patients’ physical, mental, and social quality of life. Aim: To determine factors contributing to the health-related quality of life (HRQOL) of Saudi hemorrhagic stroke survivors. Methods: A cross-sectional study was done at King Abdulaziz University Hospital (KAUH), Jeddah, KSA, on adult stroke patients. Data about the patients’ socio-demographic characters and clinical data were obtained. The Stroke-Specific QOL (SSQOL) scale was used to measure the HRQOL. Results: The mean Stroke-Specific QOL (SSQOL) domains score was 163.8 ± 46.29. Male patients and those who had bilateral lesions had a significantly higher mean SSQOL score. A non-significant positive correlation was found between the SSQOL score and the patients’ age and post-stroke duration. And a non-significant relationship was found between mean SSQOL score and patients’ nationality, educational level, smoking, marital and financial status, income, social support, insurance or other clinical data, hemorrhagic type, surgical treatment and follow up, comorbidities, or the year and duration of diagnosis. Conclusion: There is a need to use stroke rehabilitation programs to improve physical and functional independence and take into account the influence of the side of lesion on HRQOL.

Keywords: Determinants, hemorrhagic, HRQOL, patients, Saudi, stroke

Introduction

Stroke is a cerebrovascular disease that involves rapid loss of brain functions, which is caused by the disruption of blood supply to the brain and triggered by hemorrhage, Ischemia (lack of blood flow), and thrombosis (arterial blockage). [1] Stroke is the second common cause of mortality globally. [2] Stroke is the third most common cause of disability contribution by 4.5% of all disease-adjusted life-years (DALYs) causes. [3,4]

Among stroke patients, five million die every year, and another five million are permanently disabled, [5,6] facing physical, mental, and psychosocial challenges. [7] In the Middle East, the incidence rate of stroke is (22,7–250/100,000 population per year in 2000–2014) which has exceeded developed-countries rates. [8]

HRQOL is defined as a person’s or a group’s perceived physical and mental wellbeing over time. [9] Early intervention and management of patients suffering from strokes reduces mortality and lowers disability, and enhances survival and health-related quality of life (HRQOL). [10] Identifying the factors affecting HRQOL can provide a better understanding of the treatment and rehabilitation intervention methods in clinical practice. [11]
Previous studies showed that low HRQOL is associated with severe dependence, language impairment, old age, hemorrhagic stroke, and side of the lesion.[13,14]

In the Kingdom of Saudi Arabia (KSA), stroke is one of the fastest-growing cerebrovascular diseases with a prevalence of 178/100,000 per year,[9] and has become a health, social, and economic burden.[8,13,16] In 2015, a study was done at King Abdulaziz University Hospital, Jeddah, and found a low HRQOL among stroke patients. The study concluded that HRQOL is impaired in stroke survivors, where the functional independency level is its most significant predictor.[17]

Another study was done in 2016 on Egyptian and Saudi patients. The study found that stroke patients had poor QOL and needed post-stroke care programs for improving physical, mental, and social quality of life.[10]

A recent Saudi study done in 2020 on 123 Saudi stroke survivors found that the environmental domain of quality of life was perceived to be the best aspect, whereas physical health was perceived to be the poorest. Patients’ age, gender, employment status, monthly family income, type of community, education, type of stroke, side of stroke, and support from significant others had multivariate influences on the domains of quality of life.[11]

The majority of post-stroke care is provided by primary care teams. These teams provide patient-centered care to prevent repeated strokes, maximize function, reduce late consequences, and improve quality of life when they are properly structured. After a stroke, patient-centered primary care begins with laying the groundwork for post-stroke management and enlisting the help of caregivers and family members. Short-term and long-term post-stroke treatment includes screening for sequelae (such as depression, cognitive impairment, and fall risk) and unmet requirements.[12]

As studies are done to assess HRQOL and associated factors among post-stroke patients in KSA are still limited, thus, the aim of this study was to determine factors contributing to the HRQOL of Saudi hemorrhagic stroke survivors.

**Patients and Methods**

Study design and setting: a cross-sectional study was done at King Abdulaziz University Hospital (KAUH), Jeddah, KSA, during 2015–2020 in the Department of Medicine.

Study participants: adult stroke patients of both sexes, aged 18 and above, who have been diagnosed with first-ever hemorrhagic stroke using MRI and CT scan, were included. Patients with acute stroke (less than one month), problems related to memory like dementia, Alzheimer’s disease, and comprehension problems that prevented them from following verbal orders were excluded. Of the participants, 41 were screened from the medical records, and 300 of them were interviewed over the telephone or face-to-face.

Data collection instrument: a checklist was prepared to collect data about patients’ socio-demographic characters from the medical records (age, sex, marital status, education level, and income level). Clinical data such as stroke nature, stroke duration, comorbidities, weak side, mobility status, and voluntary control level of the limb were obtained. The Stroke-Specific QOL (SSQOL) scale was translated into Arabic and investigated the reliability in patients and was found to have a Cronbach’s Alpha reliability of 0.9 among studied patients and was used in a previous Saudi study.[17] The SSQOL is one of the most widely used scales clinically as well as in research as one of the most comprehensive scales which measures QOL in patients with stroke. It consists of 49 questions (each question is scored on a five-point scale, 1–5) covering 12 domains (mobility, upper limb functions, social role, energy, self-care, family role, work-productivity, language, mood, personality, thinking, and vision). Each domain is scored on a five-point scale in which 1 means complete agreement and 5 means complete disagreement. The total score ranges from 49 to 245, with higher scores indicating a better quality of life. The SSQOL-A has shown good internal consistency (cronbach’s = 0.78–0.94) and test-retest reliability (ICC = 0.77–0.94).[21]

Ethical considerations: an ethical approval for the study was obtained from the research ethics committee of King Abdulaziz University Hospital (KAUH), Jeddah, KSA. Written and verbal consents were taken from patients.

Statistical analysis: Data were coded, tabulated, and analyzed using (SPSS) version 25. Qualitative data were expressed as numbers and percentages, and quantitative data were presented as mean and standard deviation (Mean ± SD), where independent sample t-test and one-way ANOVA test were applied for parametric variables. Correlation analysis using the Pearson correlation test was done, and a P value of less than 0.05 was considered statistically significant.

**Results**

Table 1 shows that 63.4% of studied patients were males, 73.2% had a non-Saudi nationality, 39% had an educational level at the high school or more, and 70.7% were married. Of patients, 53.7% had a monthly income of less than 5000, 46.3% had a fair financial status, 80.5% were living with caregivers, only 17.1% had health insurance, and 14.6% were current smokers.

Table 2 shows that the most common hemorrhagic type among patients was the intracranial or the subdural hemorrhage (29.3%), 39% had a left-sided lesion, 34% had surgical treatment, and 46.3% had a follow-up. The most common comorbidities among patients were HTN (26.8%) and both DM, HTN (24.4%). About one-fifth of the patients (22%) were diagnosed in 2019 with a mean post-stroke duration (years) of 3.02 ± 1.78 years.

Table 3 illustrates the mean ± SD of Stroke-Specific QOL (SSQOL) domains with a total mean SSQOL score of 163.8 ± 46.29.
Figures 1 and 2 demonstrates a non-significant positive correlation between Stroke-Specific QOL (SSQOL) score and patients’ age and post stroke duration/years ($P \geq 0.05$).

Table 4 shows that male patients had a significantly higher mean SSQOL score compared to females ($P \leq 0.05$). On the other hand, a non-significant relationship between mean SSQOL score and patients’ nationality, educational level, smoking, marital and financial status, income, social support, or insurance ($P \geq 0.05$).

Table 5 shows that patients who had bilateral lesions had a significantly higher mean SSQOL score ($P \leq 0.05$). On the other hand, a non-significant relationship between mean SSQOL score and hemorrhagic type, surgical treatment and follow-up, comorbidities, or the year and duration of diagnosis ($P \geq 0.05$).

**Discussion**

This study highlighted factors associated with HRQOL among hemorrhagic stroke survivors at KAUH, Saudi Arabia, where data about stroke patients aged 18 and above were used.
Male patients had a significantly higher mean SSQOL score than female patients, according to this study. The same result was reported by Dogan A, et al. [28]

Gender was found to be a significant predictor of HRQOL in our study, and this has been confirmed by other studies. [29-31] Some studies, however, found a non-significant relationship between gender and HRQOL. [32] Aprile et al., [35] on the other hand, concluded that HRQOL was sufficiently reduced in stroke patients with a lower educational level.

Our findings are consistent with those of a previous study, which found no effect of educational level on the HRQOL of stroke survivors. This was explained by their use of the average length of formal education rather than categorizing the levels of education. [22] Furthermore, marital status and the presence of social support had no effect on stroke survivors’ HRQOL. One possible explanation is that the majority of participants are married and live with caregivers.

Clinical characteristics of disease, including hemorrhage type, side of lesion, comorbidities, time of diagnosis, surgical treatment, and whether to follow up were examined in the participants of this study. The overall HRQOL, physical, psychosocial, and communication domains were not predicted by hemorrhagic type and comorbidities. Wei Zhu, on the other hand, discovered that subarachnoid hemorrhage and comorbidities had an indirect impact on HRQOL through neurological impairment. [23] In a study conducted by Samar Goma, hemorrhagic type and comorbidities had no effect on HRQOL. [18] This could be attributed to the good health care facilities and the participants’ health awareness in our study.

This study revealed that the side of lesion was a significant predictor of HRQOL. In contrast, Patel et al., [36] found that HRQOL was sufficiently decreased in stroke patients with right hemispheric lesions. However, this was not found by Goma et al., [18] where the side of lesion was not significantly correlated with HRQOL. At the same time, surgical treatment, follow-up, and years of diagnosis had a non-significant relationship with the HRQOL of the studied patients.

Primary care professionals have a special skill in caring for patients with chronic illness and many comorbid disorders. [20,36,37] When primary care practices perform their defining functions (i.e., disease prevention, acute symptom management, and chronic illness management), they give simple access to ongoing, comprehensive, and integrated care. [20]

Support and direction from expert stroke care specialists are essential to help the primary care team coordinate and administer
post-stroke treatment. For stroke patients, a treatment pathway or case management plan that makes use of local healthcare resources would be ideal.\textsuperscript{38,39}

**Limitations**

Our study has a number of limitations. First, the study group was relatively small because of the selection criteria, which excluded patients with dementia and aphasia. Second, the small sample size of hemorrhagic stroke survivors reduces the representativeness of this study. Our cross-sectional study cannot describe the change in HRQOL over time. Finally, the level of dependence was not measured due to the lack of BI score.

**Conclusion**

This study found that male patients and those who had bilateral lesion had a significantly higher mean SSQOL score. While a non-significant relationship was found between mean SSQOL score and patients’ age, nationality, educational level, smoking, marital and financial status, income, social support, insurance, or other clinical data (hemorrhagic type, surgical treatment and follow-up, comorbidities, or the year and duration of diagnosis). There is a need to use stroke rehabilitation programs to improve physical and functional independence and take into account the influence of side of lesion on HRQOL. To manage new demands, avoid recurrence, repair problems, improve quality of life, and permit timely access to specialists as needed, all stroke patients require high-quality primary care.

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Declarations of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form, the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published, and due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest

There are no conflicts of interest.

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