ORIGINAL ARTICLE

Psychosocial assessment on stroke survivors: An observational study in a tertiary care hospital in Maharashtra

*Gracia Sohkhlet[1], Sudeep David[2] ***

[1]Department of Community Medicine, [2]Department of Pharmacology, Dr. D. Y. Patil Medical College, Hospital and Research Center, Pune-411018 (Maharashtra) India

Abstract

Background: Stroke is the leading cause for premature deaths and disability in India. For more than 30 years, assessing Quality of Life (QoL) has been a significant component in assessing stroke patients and their treatment. QoL is a multidimensional term with at least three major domains–physical, mental, and social. Because stroke may have an adverse effect on many facets of life, its effects on health-related quality of life might be severe. *Aim and Objectives:* To investigate the impact of stroke on mental status and health-related QoL among survivors in a tertiary care hospital. *Material and Methods:* An observational study was conducted in a tertiary care hospital in Pune, Maharashtra between November 2020 and November 2021. A total of 76 stroke survivors were interviewed using Stroke Specific- Quality of Life Scale (SS-QOL), Mini Mental State Examination (MMSE) and Modified Rankin Scale (MRS) to assess the patients' disability, along with their sociodemographic details. *Results:* In this study of 76 stroke survivors, there were more male patients than women. Mean age was 55 years. It was observed that 71% stroke survivors had normal cognitive assessment using MMSE. Mean score of SS-QOL was 131 hence majority had poor quality of life. Only 2% had severe impairment on MMSE and on further analysis, it was found that they had grade 5 MRS for disability, belonged to rural area, were from a nuclear type of family and had education up to higher secondary. *Conclusion:* Stroke has proven to have psychosocial effect on patients in terms of poor quality of life. Since functional status was the primary determinant of QoL, it has been hypothesised that increasing physical function may aid to improve QoL for stroke patients. It is imperative that more research be done on treatment and rehabilitation to improve the poor quality of life so that structured and focused interventions may be developed by policy makers.

Keywords: Stroke, Quality of life, Psychosocial, Mini Mental State Examination, Modified Rankin Scale

Introduction

An overarching concept called psychosocial well-being encompasses both individual and communal well-being as well as emotional or psychological well-being. Since it includes emotional, social, and physical elements, "quality of life" is comparable to psychosocial well-being [1]. Stroke is the leading cause for premature deaths and disability in India especially in low- and middle-income groups. Majority of stroke survivors suffer a lifetime due to lack of facilities for rehabilitation and due to lack of knowledge. The estimated age-adjusted prevalence rate for stroke is between 84/100,000 and 262/100,000 in rural regions and between 334/100,000 and 424/100,000 in urban areas, according to the updated India stroke factsheet from 2012 [2]. The majority of stroke survivors continue to have difficulties, and their families are left in financial ruin as a consequence of being required to pay for their ongoing care and rehabilitation. Stroke rehabilitation should be

simple and affordable because it helps patients reclaim their lives and, in doing so, they can refurbish the basic principles of life, enabling them to re-establish independence. In India, stroke rehabilitation is still underachieved due to education gap and other various reasons [3]. For more than 30 years, assessing Quality of Life (QoL) has been a significant component in assessing stroke patients and their treatment. It is challenging to define quality of life, because there is no accepted definition of the phrase. But there is considerable consensus that QoL is a multidimensional term with at least three major domains– physical, mental, and social. The idea of health-related quality of life, which focuses on how a disease and/or its treatment affect patients' perceptions of their health status and subjective well-being or sense of pleasure with life, has been widely employed by researchers and medical professionals [4]. Because stroke may have an adverse effect on many facets of life, its effects on health-related quality of life might be severe. Several tools have been developed to evaluate these effects. Many of them are self-report or self-evaluation questionnaires for patients. Some of these tools give users information on their perceived health state, such as their capacity to perform daily tasks and duties, as well as their physical and mental capacities. The other tools measure contentment with life, evaluations of various life categories that are good or negative, and well-being (or specific life domains) [5].

It is essential to design specialised programmes for functional rehabilitation, health policies to promote social participation and readjustment to employment, and health promotion strategies to lower stroke patients' risk factors. This study aimed to investigate the impact of stroke on health-related QoL and relate this incidence to people's sociodemographic characteristics.

Material and Methods

This observational study was conducted in the physiotherapy outpatient department of a tertiary care hospital in Pune, Maharashtra between November 2020 and November 2021. Assuming the prevalence of needs expressed by stroke patients is 82% as reported by Kamalakannan *et al*. in a home-based study from Chennai [3] with 95% CI and an acceptable difference of 10%, while calculating, the minimum sample size required was 57. The sample size was calculated using a WinPepi software version 2.62. A total of 76 stroke survivors were recruited as participants. The participants visiting physiotherapy outpatient or inpatient departments were interviewed using a questionnaire based on Stroke Specific-QOL and Modified Rankin Scale (MRS) for stroke patients to assess their disability.This study was approved by Institutional Ethics Committee and all stroke survivors receiving rehabilitation irrespective of duration, who gave consent and were above 18 years of age were included in the study.

Details of scales administered: A disease-specific measure called the Stroke Specific-QOL (SS-QOL) was used to measure QOL in stroke patients.It was published and validated in 1999 by Williams, Weinberger, Harris, and Clark. It is a free scale containing 49 items that cover 12 categories like vision, self-care, personality, thinking, energy, language, self-care, mood, personality, thinking, mood, upper-extremity function, mobility, family role, social role and work/productivity. Each item is rated according to a 5-point Likert scale and the weighted average of 12 domains represents the overall score on this scale. The total score ranges

from 49 to 245 with higher scores indicating better QOL. Validation of scale was found to be 0.79 to 0.93 with Cronbach's alpha [6].

The MRS assesses the disability of stroke patient. It evaluates independence as opposed to task performance. There are six ratings on the scale, ranging from 0 (no symptoms) to 5 (severe impairment). For clinical purposes, mild disability runs between 0 and 2, substantial impairment ranges between 3 and 4, and severe disability is indicated by a score of 5 [7].

Cognitive status was assessed using Mini Mental State Examination (MMSE) a widely used cognitive screening tool and developed by Folstein, and McHugh (1975). The MMSE test covers easy questions and challenges in a variety of areas, including language use and understanding, basic motor abilities, repeating lists of words, repetition in arithmetic, and the time and location of the test. To categorize the level of cognitive impairment, the following three cut-off levels are used: Mild cognitive impairment ranges from 19 to 23, moderate cognitive impairment is 10 to 18, and severe cognitive impairment is less than 10 [8]. Socioeconomic status was assessed using BG Prasad classification revised for May 2021 [9].

The data were collected using Google forms after taking informed consent and retrieved as Excel spreadsheet. The data were analysed using statistical software: MedCalc v18.2.1 [10] and Epi Info v 7.2.4.0 [11]. Categorical variables were expressed in terms of frequency and percentages. Continuous variables were expressed as mean and standard deviation (SD) or median and inter-quartile range (IQR), wherever applicable. Normal distribution was verified by Shapiro-Francia test. Mann-Whitney test and Kruskal-

Wallis test were used to check for association and correlation between groups. Value of $p < 0.05$ was considered to be statistically significant.

Results

Our study consisted of 76 participants; mean age of patients was 55 years ± SD12 years. Of these participants, 73.6% were men and 26.3% were women. Around 43% were from joint families whereas almost 57% were from nuclear families. These participants were residents of urban (48.68%) and rural (51.32%) areas. The average annual income of patients was found to be Rs. 3,89,000/- and they completed an average of 25 weeks of rehabilitation. Only 25% of participants were graduates and 10.53% were post graduates. On observing the socioeconomic status, there were only three classes, of which majority (50%) were in upper class (Table 1). Many patients (34.21%) presented a high MRS score corresponding to moderate or severe disability (MRS 3-5). Few patients (7.89%) scored less than 20 points on the MMSE while 2.63% patients had severe cognitive impairment, 5.26% had moderate cognitive impairment and 21.05% had mild cognitive impairment. Thus 71.05% of the stroke survivors had a normal cognitive assessment during the stroke rehabilitation. (Fig. 1). On further analysis of data, it was found that stroke survivors with severe cognitive impairment also had MRS score of 5, were residing in rural areas, belonged to nuclear families and were educated up to higher secondary. Table 2 presents the results of the SS-QoL scores. More than half of the patients with scores below 131 had poor quality of life. Energy, work/productivity, personality, social roles, and family roles were the domains that were most impacted. Vision, on the other hand, was the least

impacted domain. Table 3 describes the association between QoL and the sociodemographic variables of stroke patients and found that patients with lower QoL belonged to the higher age group (p<0.000001).

Table 1: Distribution of baseline sociodemographic variables of participants (N=76)

Variable	n	%
Age group (years) of patients		
18-29	4	5.2
30-49	13	17.1
50-69	54	71.2
>70	5	6.5
Educational Status		
Graduate	19	25
Higher secondary	22	28.95
Post Graduate	8	10.53
Primary	4	5.26
Secondary	5	6.58
Senior Secondary	18	23.68
Socioeconomic status based on modified BG Prasad classification		
Upper	50	65.79
Upper middle	19	25
Middle	7	9.21
Comorbidities		
DM	12	15.79
HTN	34	44.73
HTN + CVA	1	1.32
HTN + DM + CVA	1	1.32
None	28	36.84

Continued...

Variable	n	%
Modified Rankin Scale		
0	6	7.89
1	15	19.74
2	19	25
3	10	13.16
4	16	21.05
5	10	13.16

DM - Diabetes Mellitus, HTN - Hypertension, CVA - Cerebro Vascular Accident
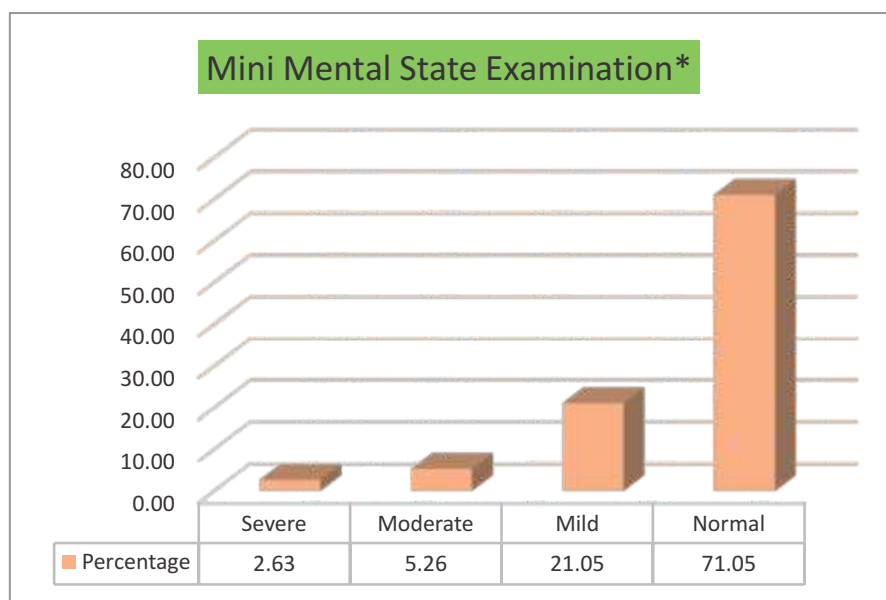
Figure 1: Bar diagram for assessment of cognitive impairment using Mini Mental State Examination

*MMSE score: Mild cognitive impairment ranges from 19 to 23, moderate cognitive impairment is 10 to 18, and severe cognitive impairment is less than 10

Table 2: Statistical findings of SS-QOL scores

Score by SS-QoL sub-domains	Mean	SD	Median	IQR
Energy (total score= 15)	7.30	3.56	6	6-7
Family role (total score=25)	5.25	2.5	5	4-6
Language (total score=25)	16.09	4.65	15.5	13-18
Mobility (total score=30)	14.92	5.18	14.5	13.98-17
Mood (total score=25)	15.57	3.47	15.5	14-17
Personality (total score=15)	9.27	4.05	9	8-10
Self-care (total score=25)	12.52	4.7	12	10.98-13
Social roles (total score=25)	10.1	3.58	10	9-11
Thinking (total score=15)	8.93	3.48	9	7.98-10
UL Function (total score=25)	13.56	5.21	13	11-15
Vision (total score=15)	10.4	3.47	11	9-12
Work/ Productivity (total score=15)	7.52	2.08	7	7-8
Total score	131.48	18.4	131	125-133.57

Table 3: Association between QoL and the sociodemographic variables

Variables	n	Median	IQR	Test statistics	*p*
Sex **Female** **Male**	20 56	126 132	111-132 120-148	1.49	0.13*
Age (years) **<45** **45-60** **>60**	14 35 27	109 126 151	100-112 121-131 144-156	63.85	< 0.000001#
Income (BG Prasad Classification) **Upper** **Upper Middle** **Middle**	50 19 7	127 127 144	116-139 118-145 136-146	3.46	0.17#

Continued...

Variables	n	Median	IQR	Test statistics	*p*
Educational level				1.68	0.19#
Post Graduate	8	136	111-150		
Graduate	19	130	117-136		
Higher Secondary	22	121	113-131		
Senior Secondary	18	145	125-159		
Primary	4	136	125-148		
Secondary	5	148	134-157		
Type of Family				0.94	0.34#
Joint	33	131	120-151		
Nuclear	43	131	119-138		
Total weeks of rehabilitation				1.60	0.44#
<1month	55	127	120-146		
1-6months	11	137	132-144		
>6months	10	121	112-150		
Rural	39	125	116-137	1.53	0.12*
Urban	37	134	122-149		
Modified Rankin Scale	6			8.56	0.12#
0-No Symptoms at all	15	128	111-153		
1-No significant disability despite symptoms, able to carry out all duties and activities	19	120	111-131		
2- Slight disability, unable to carry out all the previous activities, but able to look after own affairs without assistance	10	131	125-136		
3-Moderate inability, requiring some help, but able to walk without assistance	16	137	116-139		
4- Moderate severe disability, unable to walk and attend to bodily needs without assistance	10	151	122-158		
5- Severe disability, bedridden, incontinent, and requiring constant nursing care and attention		125	120-136		

*Mann-Whitney test #Kruskal-Wallis test

Discussion

The main objective of stroke therapy is to lessen patients' level of disability in order to promote functional independence, which help them to be integrated into the community and improve their quality of life. We observed 76 stroke survivors and it was found that there were more males (73.6%) than females (26.3%) which correspond with similar findings in various articles [12-14]. In contrast, other studies revealed the opposite, i.e., females were more than males. Petrea *et al*. had obtained the stroke surveillance details from Framingham Heart Study, and found it consisted of 56.1% females [15].

Our patients' median age was 55 or higher, demonstrating that people in their prime working years were impacted by stroke [16]. Despite being at a stage between adulthood and senescence, these patients were autonomous in carrying out their daily tasks and social obligations. Therefore, suffering a stroke at this age will have an impact on their daily functioning and social lives.

The presence of other chronic conditions can complicate stroke recovery. The comorbidities found in majority of our stroke survivors were hypertension (44.73%), followed by diabetes mellitus (15.79%). Few stroke survivors also had history of cardiovascular problems (23.68%); remaining survivors did not have any comorbidities. Similar studies have found hypertension to be the most prevalent comorbidity, followed by diabetes mellitus [17]. Apart from them, there are various other comorbidities and habits that can predispose to stroke such as dyslipidaemia, obesity, smoking and alcohol consumption [18-19].

We found the incidence of stroke to be higher in rural (51.3%) people than in urban people. Stroke survivors falling in the MRS-5 category were residing in rural areas. Similarly, people with lower socioeconomic status had a higher risk of stroke. These findings are similar to other studies [20-21], thereby suggesting potential role of indigenous and local elements in stroke development and their requiring consideration in preventative and therapeutic paradigms.

We found that 71.05% of the stroke survivors had a normal cognitive assessment during the stroke rehabilitation, while the remaining suffered from mild to severe cognitive impairment. Dementia following stroke has been observed in other studies [22]. On observing the QoL in stroke survivors, majority of SS had a poor to good quality of life. In the plurality of past research on the QoL of stroke patients, some of which were cross-sectional and others of which included long-term follow-up, the degree of functional impairment served as the primary determinant of QoL. Additionally, they had social difficulties. They were unable to pursue their interests and hobbies and perceived their health to be a social impediment. Because of their disability, they required frequent assistance when walking, climbing stairs, standing up, and getting out of a chair. They could also not bend over to reach for objects. On the other hand, people were able to continue and make progress toward their recovery with the help of social and family support. The QoL of these patients were lower than the general population. In other studies, functional disability level was the major cause for poor quality of life. Previous research has linked decreased mobility to a loss of independence, lower QoL,

institutionalization, and an increased risk of mortality in older persons [23-24].

In another study, they found that despite a fair recovery in terms of hospital discharge, activities of daily living, and return to work, the majority of patients' (83%) quality of life had not been restored to pre-stroke levels. Deterioration in various domains of life ranged from 39% to 80%, with the lowest in the domain of home activities and the greatest in the domain of leisure time activities [25].

Reeves *et al*. conducted a study on 290 stroke survivors taking information at baseline and 90-day post stroke and comparing between Mexican Americans (MA) and non-Hispanic (NH) whites. They found similar results where overall post stroke QOL was reduced for MA compared to NH. It is worth noting that when compared to overall and physical post stroke QOL scores, the average scores for psychosocial post stroke QOL were lower among both MAs and NHWs [26]. In another study, patients with good outcome (MRS 0 to 1) had better QoL in physical domain compared with patients with poor outcome (MRS $\geq$ 2) which was similar to the findings in our study [27].

Conclusion

Our study reported that 71% of stroke patients had normal cognitive assessment, while 2% had significant impairment. It was also found that more rural area stroke survivors had a MRS severe disability score of 5.The SS-QOL scale showed a mean score of 131 (minimum score-49, maximum score-245), indicating that stroke survivors had poor quality of life and frequently felt like a burden to their families.

Limitation

The study only included base line cross-sectional data collection. A better range of post stroke QoL could have been assessed with 3 to 6-monthly follow-up along with mental status evaluation for early signs of depression, thereby restricting generalizability of our findings. Similar research studies in the future may consider incorporating a cohort study method, particularly in rural areas.

References

1. Eiroa-Orosa FJ. Understanding psychosocial wellbeing in the context of complex and multidimensional problems. *Int J Environ Res Public Health* 2020; 17(16): 5937.

2. Pandian JD, Sudhan P. Stroke epidemiology and stroke care services in India. *J Stroke* 2013; 15(3): 128-134.

3. Kamalakannan S, Gudlavalleti VM, Prost A, Natarajan S, Pant H, Chitalurri N, *et al*. Rehabilitation needs of stroke survivors after discharge from hospital in India. *Arch Phys Med Rehabil* 2016; 97(9): 1526-1532.e9.

4. Jaracz K, Kozubski W. Quality of life in stroke patients. *Acta Neurol Scand* 2003; 107(5): 324-329.

5. Opara J, Jaracz K. Quality of life of post–stroke patients and their caregivers. *J Med Life* 2010; 3(3): 216-220.

6. Williams LS, Weinberger M, Harris LE, Clark DO, Biller J. Development of a stroke-specific quality of life scale. *Stroke* 1999; 30(7): 1362-1369.

7. Banks JL, Marotta CA. Outcomes validity and reliability of the modified Rankin scale: implications for stroke clinical trials: a literature review and synthesis. *Stroke* 2007; 38(3): 1091-1096.

8. Tombaugh TN, McIntyre NJ. The mini-mental state examination: A comprehensive review. *J Am Geriatr Soc* 1992; 40(9): 922-935.

9. Majhi MM, Bhatnagar N. Updated B.G Prasad's classification for the year 2021: consideration for new base year 2016. *J Family Med Prim Care* 2021; 10(11): 4318-4319.

10. MedCalc Statistical Software version 18.2.1 (MedCalc Software, Ostend, Belgium; http://www.medcalc.org; 2018).

11. Dean AG, Arner TG, Sunki GG, Friedman R, Lantinga M, Sangam S, *et al*. Epi Info™, a database and statistics program for public health professionals. CDC, Atlanta, GA, USA, 2011.

12. Dalal PM, Malik S, Bhattacharjee M, Trivedi ND, Vairale J, Bhat P, *et al*. Population-based stroke survey in Mumbai, India: incidence and 28-day case fatality. *Neuroepidemiology* 2008; 31(4): 254-261.

13. King RB, Ainsworth CR, Ronen M, Hartke RJ. Stroke caregivers: pressing problems reported during the first months of caregiving. *J Neurosci Nurs* 2010; 42(6): 302-311.

14. Oni OD, Olagunju AT, Okpataku CI, Erinfolami AR, Adeyemi JD. Predictors of caregiver burden after stroke in Nigeria: Effect on psychosocial well-being. *Indian J Psychiatry* 2019; 61(5):457-464.

15. Petrea RE, Beiser AS, Seshadri S, Kelly-Hayes M, Kase CS, Wolf PA. Gender differences in stroke incidence and post stroke disability in the Framingham heart study. *Stroke* 2009; 40(4): 1032-1037.

16. Balakrishnan R, Kaplan B, Negron R, Fei K, Goldfinger JZ, Horowitz CR. Life after stroke in an urban minority population: A photovoice project. *Int J Environ Res Public Health* 2017; 14(3):293.

17. Simić-PD, Bošković K, Milićević M, Rabi ŽT, Cvjetković BM, Tomašević-TS, *et al*. The impact of comorbidity on rehabilitation outcome after ischemic stroke. *Acta Clin Croat* 2018; 57(1): 5-15.

18. Bhattacharjee M, Vairale J, Gawali K, Dalal PM. Factors affecting burden on caregivers of stroke survivors: Population-based study in Mumbai (India). *Ann Indian Acad Neurol* 2012; 15(2): 113-119.

19. Kennedy RE, Howard G, Go RC, Rothwell PM, Tiwari HK, Feng R, *et al*. Association between family risk of stroke and myocardial infarction with prevalent risk factors and coexisting diseases. *Stroke* 2012; 43(4): 974-979.

20. Xu F, Tse AL, Yin X, Yu IT, Griffiths S. Impact of socio-economic factors on stroke prevalence among urban and rural residents in Mainland China. *BMC Public Health* 2008; 8: 170.

21. Addo J, Ayerbe L, Mohan KM, Crichton S, Sheldenkar A, Chen R, *et al*. Socioeconomic status and stroke: an updated review. *Stroke* 2012; 43(4): 1186-1191.

22. D'Souza CE, Greenway MRF, Graff-Radford J, Radford JG, Meschia JF. Cognitive impairment in patients with stroke. *Semin Neurol* 2021; 41(1): 75-84.

23. Gunaydin R, Karatepe AG, Kaya T, Ulutas O. Determinants of quality of life (QoL) in elderly stroke patients: a short-term follow-up study. *Arch Gerontol Geriatr* 2011; 53(1): 19-23.

24. von Bonsdorff M, Rantanen T, Laukkanen P, Suutama T, Heikkinen E. Mobility limitations and cognitive deficits as predictors of institutionalization among community-dwelling older people. *Gerontology* 2006; 52(6): 359-365.

25. Niemi ML, Laaksonen R, Kotila M, Waltimo O. Quality of life 4 years after stroke. *Stroke* 1988; 19(9): 1101-1107.

26. Reeves SL, Brown DL, Baek J, Wing JJ, Morgenstern LB, Lisabeth LD. Ethnic differences in post stroke quality of life in the Brain Attack Surveillance in Corpus Christi (BASIC) project. *Stroke* 2015; 46(10): 2896-2901.

27. Raju RS, Sarma PS, Pandian JD. Psychosocial problems, quality of life, and functional independence among Indian stroke survivors. *Stroke* 2010; 41(12): 2932-2937.

*Author for Correspondence:

Dr. Sudeep David, Department of Pharmacology, Dr. D Y Patil Medical College, Hospital and Research center, DPU, Pune-411018

Email:sudeep.david@gmail.com Cell: 8072146126