Health-related quality of life after stroke

Qualidade de vida relacionada à saúde de pessoas após acidente vascular cerebral

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Abstract

Objective: To assess health-related quality of life after stroke and associate this event with the characteristics of people who suffered a stroke.

Methods: Cross-sectional study conducted at a rehabilitation center for stroke survivors with 104 patients. The Mini-mental state examination (MMSE); an instrument for collection of sociodemographic, economic, clinical, and family related information; and the Stroke Specific Quality of Life Scale were applied.

Results: Of the 104 people investigated, 77 did not have cognitive deficit and answered the instruments. Their mean at the MMSE was 24.9 (±4.3). 51.9% were men and their mean age was 57.3 (±17.2) years. Most of them were married (48.1%) and had eight or more years of schooling (50.7%). Their health-related quality of life was affected (146.8±36.3), mainly in the social and family relations domains.

Conclusion: An impairment in the health-related quality of life and negative consequences of the stroke were observed, together with dyslipidemia, left-side hemiplegia, and speech difficulty.

Resumo

Objetivo: Avaliar a qualidade de vida relacionada à saúde de pessoas após acidente vascular cerebral e associar esse evento às características desses indivíduos.

Métodos: Estudo transversal realizado em centro de reabilitação com pessoas sobreviventes de acidente vascular cerebral com 104 pacientes. Foram aplicados Miniexame do Estado Mental; instrumento para coleta de informações sociodemográficas, econômicas, do arranjo familiar e clínicas; e *Stroke Specific Quality of Life Scale.*

Resultados: Das 104 pessoas investigadas, 77 não apresentaram défice cognitivo e responderam aos instrumentos. A média no Miniexame do Estado Mental foi 24,9 (±4,3); 51,9% eram homens, a média da idade foi 57,3(±17,2) anos, a maioria era casada (48,1%), com 8 anos ou mais de estudo (50,7%). A qualidade de vida relacionada à saúde foi afetada (146,8±36,3), principalmente nos domínios relações sociais e familiares.

Conclusão: Evidenciaram-se comprometimento da qualidade de vida relacionada à saúde e consequências negativas da doença, associadas à escolaridade, dislipidemia, hemiplegia esquerda e dificuldade de fala.

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Introduction

Strokes are the second death cause in the world. Projections show that one in every six people will have a stroke in life; 15 million people suffer a stroke per year and 6 million do not survive. Among those who do survive, most have residual impairments.[1]

Such sequelae make individuals partly or totally handicapped and have serious implications for their quality of life because of years lost in productive life, additionally to the high financial costs involved.[2]

The term "health-related quality of life" is commonly used with similar objectives to the more general concept of quality of life. However, quality of life has a broader definition, influenced by sociological studies that do not allude to illnesses and impairments, whereas health-related quality of life seems to refer to aspects that are more directly related to illnesses or health care interventions.[3] Research shows a decay in the domains and quality of life related to post-stroke health.[4-6]

Based on the aforementioned facts, the objective of this study was to assess health-related quality of life in people who suffered a stroke and connect this event to these individuals' characteristics.

Methods

A cross-sectional study was conducted between February and August, 2014, at the rehabilitation center Centro Integrado de Reabilitação de Teresina, in the state of Piauí, northeast Brazil. This center is a non-profit institution dedicated to the rehabilitation of disabled people.

The population consisted of 255 patients who were seeking post-stroke rehabilitation in 2014. Simple random sampling was used and the sample calculation took into account a tolerable error of 6%, with a 95% significance level that resulted in 132 participants.

After applying inclusion criteria (age ≥18 years and confirmed stroke diagnosis) and exclusion criteria (neurological comorbidity and language con-

straints that would prevent individuals from answering the questions), the sample had 104 patients. The Mini-mental state examination (MMSE) was used for cognitive tracing to assess whether an individual had the necessary understanding to answer the questions in the additional instruments, with a sample loss of 27 participants who did not have this prerequisite (Figure 1).

The research instruments used were: the MMSE to assess cognitive functions and select individuals who were capable of answering the other instruments; a structured script to obtain sociodemographic and economic data, in addition to family and health related information; and the Stroke Specific Quality of Life Scale (SS-QOL).

The MMSE is one of the most commonly used scales for cognitive assessment. It assesses the domains of orientation to time, orientation to place, registration, attention and calculation, recall, language, repetition, and complex commands.[7] Its scoring goes from zero (higher degree of cognitive impairment) to 30 points (best capability), and cut-off scores are adjusted according to schooling: 13 points for illiterates, 18 for low schooling (1 to 4 years, unfinished) and average schooling (4 to 8 years, unfinished), and 26 for high schooling (8 or more years) – which were the recommendations adopted in this study.[8]

The SS-QOL is a specific instrument to assess health-related quality of life among people who suffered a stroke, which was culturally validated and adapted to Brazil.[9,10] It lists 49 items in 12 domains and its scoring goes from 49 to 245 points. Answers vary from 1 to 5 points; higher figures indicate better health-related quality of life.[6,9]

Techniques of descriptive and inferential statistics were applied and the software Statistical Package for the Social Sciences, version 18.0, was used. For categorical variables, absolute and percentage frequencies were measured; for numerical variables, means and standard deviations were calculated. Means between health-related quality of life scores and groups categorized according to qualitative variables were associated by means of the Student's t test of two independent samples (dichotomy variables) and the Analysis of Variance
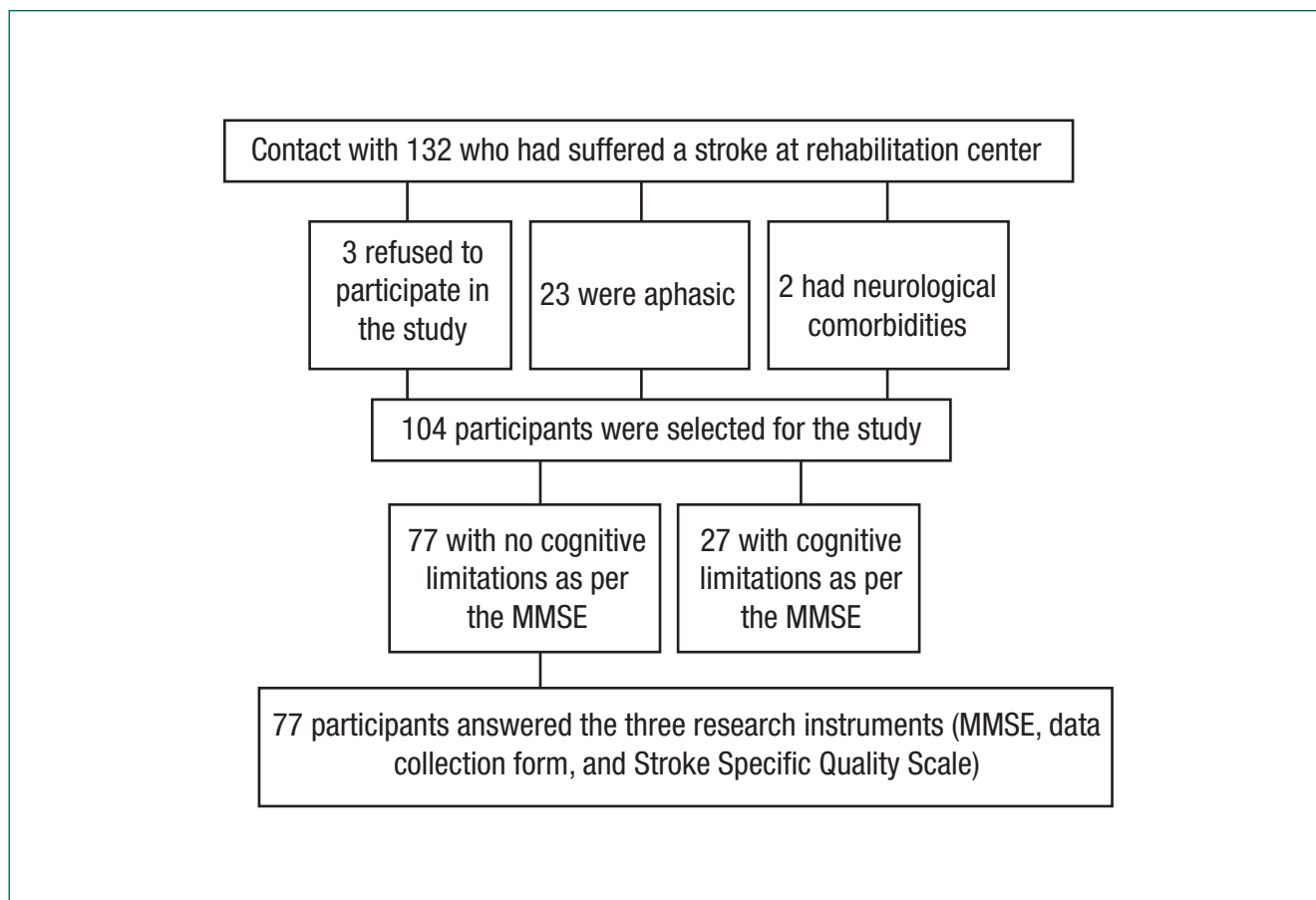
MMSE-Mini-Mental State Examination

Figure 1. Flowchart of study participants'selection

(ANOVA, for variables with more than two categories with the *post hoc* test, Tukey's correction).

To test the correlation between continuous quantitative variables, Pearson's correlation coefficient was used for normal distribution variables and its nonparametric correspondent, Spearman's correlation, was used for non-normal distribution data. An alpha 0.05 level of significance was used for all the analyses conducted (p≤0.05).

This study was registered into the Plataforma Brasil under Certificate of Presentation for Ethical Appreciation (CAAE, as per its acronym in Portuguese) number 21885513.4.0000.5214.

Results

Initially, the MMSE (n=104) was applied and the mean was 23.1 points (±5.54). Considering the cut-off score adjusted according to schooling, 26% of the sample had cognitive deficit and, for that reason, these individuals did not proceed on to the additional stages.

Among the people without cognitive deficit (n=77), the mean scoring on the MMSE was 24.9 (±4.3). 51.9% of respondents were men; their mean age was 57.3 years (±17.2); the majority was married (48.1%), with eight or more years of schooling (50.7%) and low income (Table 1).

All the dimensions evaluated by the SS-QOL suffered a decline. The most impaired domains were social relations (2.1) and family relations (2.4). The least impaired were sight (4.3) and language (3.8) (Table 2).

There was a positive moderate association between the MMSE scores and health-related quality of life. As for the variables schooling, dyslipidemia, left hemiplegia, and difficulty of speech, they interfered negatively on health-related quality of life (Table 3).

Table 1. Characteristics of people who suffered a stroke (n=77)

Characteristics	Mean±SD	n(%)
MMSE Score	24.9(4.3)	
Sex		
Male		40(51.9)
Female		37(48.1)
Age (years)	57.3(17.2)	
Skin color		
White		19(24.7)
Black		13(16.9)
Brown		44(57.1)
Yellow		1(1.3)
Marital status		
Single		19(24.7)
Married		37(48.1)
Divorced/separated		8(10.4)
Widowed		5(6.5)
Living with a partner		8(10.4)
Schooling		
Illiterate		11(14.3)
1 to 8 years, unfinished		27(35)
8 or more years		39(50.7)
Individual income (MW)*	1.333.0(1.616.3)	
≤1		42(54.4)
Greater than 1 up to 2		21(27.3)
>2		14(18.3)
Has a caretaker		
Yes		54(70.1)
No		23(29.9)
Who the caretaker is		
Spouse		19(35.2)
Child		16(29.6)
Other		19(35.2)
Stroke type		
Ischemic		49(63.6)
Hemorrhagic		22(28.6)
No answer		6(7.8)
Had a stroke before		
Yes		15(19.5)
No		62(80.5)
Hospitalization (days)	20.42(25.42)	
No		2(2.6)
1		3(3.8)
2-7		21(27.3)
8-15		24(31.2)
>15		25(32.5)
No answer		2(2.6)
Risk factors		
Systemic high blood pressure		56(72.7)
Diabetes		12(15.6)
Cardiopathies		16(20.8)
Dyslipidemia		37(48.1)
Sedentariness		56(72.7)
Smoking		25(32.5)
Frequent intake of alcohol		28(36.4)
Sequelae		
Left-sided hemiparesis		30(39)
Right-sided hemiparesis		32(41.6)
Right-sided hemiplegia		6(7.8)
Visual impairment		9(11.7)
Speech impairment		22(28.6)

*When this study was conducted, the minimum wage in Brazil was BRL 724; SD - standard deviation; MMSE - Mini-Mental State Examination; MW - minimum wage

Table 2. Stroke Specific Quality of Life Scale (SS-QOL) scores applied to people who suffered a stroke (n=77)

Health-related quality of life-SS-QOL	Mean ± SD Total score per domain	Mean ± SD Score per answer
Domain personal care	17.0(5.2)	3.4(1.1)
Domain sight	12.8(2.6)	4.3(0.9)
Domain language	18.8(5.5)	3.8(1.1)
Domain mobility	17.79(7.5)	3.3(1.0)
Domain work/productivity	8.6(3.5)	2.9(1.2)
Domain upper members' function	14.9(5.4)	3.0(1.1)
Domain way of thinking	9.0(3.6)	3.0(1.2)
Domain behavior	7.7(4.3)	2.6(1.4)
Domain stamina	14.2(5.5)	2.8(1.1)
Domain family relations	7.3(3.7)	2.4(1.2)
Domain social relations	10.6(5.3)	2.1(1.1)
Domain energy	8.1(4.2)	2.7(1.4)
Total score - Health-related quality of life	146.8(36.3)	3.1(0.8)

SD - standard deviation

Table 3. Association between characteristics of people who suffered a stroke and health-related quality of life score (n=77)

Variables	n	HRQoL**	Statistic	p-value
MMSE score	77		0.4*	0.0
Sex			-0.3†	0.8
Female	37	145.7 (39.6)		
Male	40	147.9 (33.5)		
Age			-0.2‡	0.1
Skin color			1.2‡	0.3
White	19	157.7 (43.6)		
Black	13	148.4 (31.3)		
Brown	44	142.2 (34.3)		
Marital status			1.1†	0.3
Married	37	152.3 (40.7)		
Not married	40	143.0 (32.8)		
Schooling			6.4§	0.0
Illiterate	11	131.3 (24.3)		
1 to 8 years, unfinished	27	133.5 (29.5)		
8 or more years	39	160.5 (38.7)		
Monthly individual income (MW)¶			0.1*	0.3
≤1	42	144.2 (36.6)		
>1 up to 2	21	139.3 (36.5)	2.1§	0.1
>2	9	158.6 (31.6)		
Type of stroke			-1.3†	0.2
Ischemic	49	142.2 (34.2)		
Hemorrhagic	22	154.9 (42.2)		
Had a stroke before			-0.8†	0.4
Yes	15	140.2 (38.8)		
No	62	148.5 (35.8)		
Hospitalization days			0.1†	0.5
Sequelae				
Left-sided hemiparesis			-0.5†	0.6
Yes	30	144.1 (37.8)		
No	47	148.6 (35.7)		
Right-sided hemiparesis			2.0†	0.0
Yes	32	156.4 (35.3)		
No	45	140.0 (35.8)		
Variables	**n**	**HRQoL***	**Statistic**	**p-value**
Left-sided hemiplegia			-2.1†	0.0
Yes	6	118.2 (26.5)		
No	71	149.27(36.1)		

continuation

Variables	n	HRQoL**	Statistic	p-value
Sight impairment			-0.6†	0.1
Yes	9	140.0 (28.1)		
No	68	147.8 (37.3)		
Speech impairment			-2.2†	0.0
Yes	22	134.7 (26.7)		
No	55	151.7 (38.7)		
Other sequelae			-1.3†	0.2
Yes	13	135.2 (36.1)		
No	64	149.2 (36.2)		
Risk factors				
Systemic high blood pressure			-1.6†	0.1
Yes	56	142.8 (34.2)		
No	21	157.8 (40.2)		
Diabetes			-0.9†	0.4
Yes	12	140.0 (25.0)		
No	65	148.1 (38.0)		
Cardiopathies			-0.2†	0.8
Yes	16	145.2 (33.4)		
No	61	147.3 (37.3)		
Dyslipidemia			-2.2†	0.0
Yes	37	137.7 (31.4)		
No	40	155.4 (38.8)		
Sedentariness			-0.6†	0.6
Yes	56	145.4 (37.1)		
No	21	150.6 (34.7)		
Smoking			-0.4†	0.7
Yes	25	144.7 (38.9)		
No	52	147.9 (35.4)		
Frequent alcohol use			-0.6†	0.6
Yes	28	143.5 (40.4)		
No	49	148.8 (34.0)		

Values in numbers, mean ± standard deviation, and statistic test values; * Spearman's Correlation; † Student's *t* test of two independent samples; ‡ Pearson's correlation; § Analysis of Variance; 95% confidence interval; α=0.05; ¶ when this study was conducted, MW was BRL 724; MW - minimum wage; ** HRQoL - health-related quality of life

Discussion

Among the limitations of this study, authors highlight its cross-sectional approach, which did not allow to establish a cause and effect relationship, and a high sample loss because of cognitive deficit, which hindered a generalization of the results found.

Nursing has a significant impact on recovery after a stroke. At the data collection site, the illness sequelae were the most important causes for rehabilitation; therefore, assessing health-related quality of life can provide a global profile of functional and psychosocial conditions, as well as the perception of life by subjects. That can improve both this process and the perception of health-related quality of life, enabling the creation of resources and policies for improved quality in primary care.

Assessing health-related quality of life in people with various illnesses has been a frequent research topic; nevertheless, the increase in survival rates has not been proportional to the maintenance of the same quality of life found before the illness. One of the events which can significantly compromise people's daily lives is the occurrence of strokes, due to their limiting potential on both physical and emotional aspects.[6]

A stroke is one of the main determining factors of cognitive decline. In this study, the mean found at the MMSE among the 104 initial participants was 23.1 points (±5.54), a different value compared to that of another study that found a lower mean.[11] In this sample, 26% had cognitive deficit, a lower value than the 45% prevalence of patients with this type of deficit found in literature.[12] These results can be attributed to the fact that this study's participants had more years of schooling than those found in similar research, which influences an increase in scoring.

The population more often affected by strokes comprises older black men, more commonly older than 65 years of age.[4-6,13,14] In this study, there was a predominance of brown men and mean age was lower (57.3 years). This may reflect the regional population characteristics.[15]

The presence of the family and the existence of a spouse are essential for sharing a stroke's enormous negative impact on survivors' lives and aid in the demand for care. In this study, married men were the majority (48.1%) as in similar studies.[4,16]

In other research conducted with survivors, schooling is usually low or none.[17,18] Low schooling and lack of information on this illness consist of risk factors for its occurrence.[18] In this study, however, 50.7% of the sample had eight years or more of schooling.

The occurrence of stroke is influenced by social and economic conditions. The lack of access to information and health care services can increase the possibility of being ill. Consequently, studies found survivors who earn one minimum wage or less.[6,18] Similarly, most of this study's participants had low income, which is compatible with the fact that the data collection site was exclusive for Unified Health System users.

Family engagement is crucial in the process of illness. In this research, it was evident that most

survivors counted on a caretaker (70.1%), who was often a spouse (35.2%). In this sense, informal care for patients at home is usually performed by family members.[6]

Ischemic strokes occur in about 85% of the cases and hemorrhagic strokes account for 15% of the total.[2] In this study, hemorrhagic strokes were predominant. This may be related to the fact that participants were undergoing rehabilitation treatment after they were affected by this type of stroke, often the cause of sequelae and death.

Risk factors increase the probability of occurrence of this illness. Participants of this study had various risk factors previous to the occurrence of the stroke, especially high blood pressure, dyslipidemia, and sedentariness, which correspond to what is found in literature.[2]

A significant percentage of survivors had some type of impairment after the first episode of the illness, which caused dissatisfaction with life and various functional limitations. The most common sequelae in this study were right-sided hemiparesis (41.6%), left-sided hemiparesis (39%), and difficulty of speech (28.6%). Similarly, other research found mobility and speech sequelae among the most common ones.[4,6,19]

As far as health-related quality of life is concerned, the total score obtained in the SS-QOL had a mean of 146.84 (±36.3). A German study established scores below 60% (<147 points) as low quality of life, the same criterion adopted in this study.[20] Thus, health-related quality of life was undermined. In the case of chronic illnesses and their sequelae, health-related quality of life is generally affected and tends to be jeopardized.[6] A study conducted in another state of Brazil's northeast region found a mean that was slightly above the one found in this study (171.4±35.5).[21]

Regarding the mean scores related to answers obtained in terms of general health-related quality of life, this study confirms the results of others, highlighting the damage caused by a stroke.[4,19] Nonetheless, American longitudinal studies reached higher means.[22,23]

The most impaired domains in terms of health-related quality of life were social relations (2.1) and family relations (2.4). The least impaired ones were sight (4.3) and language (3.8) – SS-QOL dimensions among the most and least impaired domains, which is consistent with results observed in literature.[4,6,19,24]

Strokes and their sequelae harm or prevent people from fully resuming their work and social activities, justifying the damage to the social relations domain. After the occurrence of this illness, people often find themselves in situations of incapacity and dependence and in need of a caretaker, who is usually a family member. Such fact, in addition to the possible dropout from the work market, abandonment of daily activities, and consequent income reduction may explain the damage in the family relations domain.

When associating the MMSE scores with health-related quality of life, higher MMSE scores were seen associated with higher scores in health-related quality of life. Cognitive deficit is one of the important sequelae of stroke, which may impact on the quality of life of people who suffered it.[25] A better cognitive state positively impacts one's quality of life.

When it comes to the association between sociodemographic and economic data and health-related quality of life, it was seen that low schooling impacts negatively on quality of life. People with less schooling usually have less information about this illness and about the health care network existing for their care and rehabilitation; consequently, their access to these services is damaged and this has negative repercussions for their job and income opportunities, which may justify their lower health-related quality of life.

In the comparison between the clinical characteristics and total health-related quality of life scores, a statistically significant difference was seen in the variables dyslipidemia, left-sided hemiplegia, right-sided hemiplegia, and speech impairment.

Dysplidemic people have a greater risk of developing atherosclerosis,[26] which, in turn, is a risk factor for other comorbidities. Other comorbidities and the need for closer medical follow-up, additionally to more restrictive diets and wider use of medicines combined with low income, may explain lower health-related quality of life among people with this risk factor.

Mobility changes are seen among the consequences of stroke. People's ability to move around the environment is a prerequisite for them to perform activities of daily living and keep their independence.[27] Thus, the presence of left-sided hemiplegia implies in reduced health-related quality of life. On the other hand, a contradictory and new finding of this study was that hemiplegics of the right hemibody had better health-related quality of life in comparison with those without this sequela.

Brain injuries caused by a stroke can also determine sequelae to verbal and writing language skills. That, in turn, can produce communication difficulties, causing social isolation which unchains or aggravates depression and thus interferes with quality of life.[28]

Conclusion

Health-related quality of life specifically among people who suffered a stroke decreases after its occurrence and is associated with some characteristics. Lower schooling, additionally to the occurrence of dyslipidemia, left-sided hemiplegia, and speech impairments contributed for its damaging. Higher scores on the MMSE, however, were related to better scores in terms of quality of life.

Acknowledgments

Collaborations

Canuto MAO, Nogueira LT, and Araújo TME state that they contributed for the study concept and project, data analysis and interpretation, writing of this article, relevant critical review of its intellectual content, and final approval of the version to be published.

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