Functionality, stress and quality of life of stroke survivors

Funcionalidade, estresse e qualidade de vida de sobreviventes de acidente vascular encefálico

Funcionalidad, estrés y calidad de vida de sobrevivientes de accidente vascular encefálico

Cleane Rosa Ribeiro da Silva[1] https://orcid.org/0000-0002-0475-2950
Tatiana Ferreira da Costa[2] https://orcid.org/0000-0002-6448-4302
Maria de Lourdes de Farias Pontes[1] https://orcid.org/0000-0002-5187-6876
Cláudia Jeane Lopes Pimenta[1] https://orcid.org/0000-0002-1458-8226
Thaíse Alves Bezerra[1] https://orcid.org/0000-0003-3242-4468
Gerlania Rodrigues Salviano Ferreira[1] https://orcid.org/0000-0002-6956-9831
Lia Raquel de Carvalho Viana[1] https://orcid.org/0000-0002-4220-906X
Kátia Neyla de Freitas Macedo Costa[1] https://orcid.org/0000-0003-2054-6943

Abstract

Objective: To correlate functional capacity and perceived stress with the health-related quality of life of stroke survivors.

Methods: This is a cross-sectional analytical study, conducted with 160 stroke survivors registered in Family Health Units. Data were collected using a semi-structured instrument to obtain sociodemographic and health data, the Barthel Index, the Perceived Stress Scale and the Stroke Specific Quality of Life Scale. Correlations between instrument scores were verified by Spearman's correlation test.

Results: Participants showed moderate functional dependence and perceived stress. Low health-related quality of life was evidenced, with greater impairment in the social roles and family roles domains. There was a statistically significant correlation between health-related quality of life and functional capacity (r=705; p<0.001) and perceived stress (r=-436; p<0.001).

Conclusion: Functional capacity and perceived stress were significantly related to the health-related quality of life of people affected by stroke, demonstrating that health-related quality of life increases as functionality increases and stress decreases.

Resumo

Objetivo: Correlacionar a capacidade funcional e o estresse percebido com a qualidade de vida relacionada à saúde de sobreviventes de acidente vascular encefálico.

Métodos: Estudo analítico transversal, realizado com 160 sobreviventes de acidente vascular encefálico cadastrados em Unidades de Saúde da Família. Os dados foram coletados mediante a utilização de um instrumento semiestruturado para obtenção dos dados sociodemográficos e de saúde, o Índice de Barthel, a Escala de Estresse Percebido e a Escala de Qualidade de Vida Específica para acidente vascular encefálico. As correlações entre os escores dos instrumentos foram verificadas pelo Teste de Correlação de Spearman.

Resultados: Os participantes apresentaram dependência funcional e estresse percebido moderados. Evidenciou-se baixa qualidade de vida relacionada à saúde, com maior comprometimento nos domínios papéis sociais e papéis familiares. Verificou-se correlação estatística significativa entre a qualidade de vida relacionada à saúde com a capacidade funcional (r=705; p<0,001) e o estresse percebido (r=-436; p<0,001).

Conclusão: A capacidade funcional e o estresse percebido relacionaram-se de forma significativa à qualidade de vida relacionada à saúde de pessoas acometidas por acidente vascular encefálico, demonstrando que a qualidade de vida relacionada à saúde se eleva à medida que a funcionalidade aumenta e o estresse diminui.

Resumen

Objetivo: Correlacionar la capacidad funcional y el estrés verificado con la calidad de vida relacionada a la salud de sobrevivientes de accidente vascular encefálico.

Métodos: Estudio analítico transversal, realizado con 160 sobrevivientes de accidente vascular encefálico registrados en Unidades de Salud de la Familia. Los datos fueron recopilados por medio de la utilización de un instrumento semiestructurado para la obtención de los datos sociodemográficos y de salud, el Índice de Barthel, la Escala de Estrés Percibido y la Escala de Calidad de Vida Específica para accidente vascular encefálico. Las correlaciones entre las puntuaciones de los instrumentos fueron verificadas por medio de la Prueba de Correlación de Spearman.

Resultados: Los participantes presentaron una dependencia funcional y estrés percibidos moderados. Se evidenció una baja calidad de vida relacionada con la salud, con un mayor comprometimiento en los dominios roles sociales y roles familiares. Se observó una correlación estadística significativa entre la calidad de vida relacionada con la salud, con la capacidad funcional (r=705; p<0,001) y el estrés percibido (r=-436; p<0,001).

Conclusión: La capacidad funcional y el estrés percibido se relacionaron de forma significativa con la calidad de vida relacionada con la salud de personas acometidas por accidente vascular encefálico, demostrando que la calidad de vida relacionada con la salud se eleva a medida que la funcionalidad aumenta y el estrés disminuye.

Introduction

Stroke has a high incidence rate over the years and is one of the main causes of morbidity and mortality in the world.[1] Epidemiological data show that stroke is the second most common cause of death in the world and among Latin American countries, Brazil has the highest mortality rate.[2]

Among people who have suffered a stroke, about 82% are discharged from the hospital.[3] However, stroke is considered the main cause of acquired functional disability, due to the sequel that frequently affect survivors worldwide.[4] Studies show that after a stroke, most people present some functional impairment, which results in different degrees of chronic disability.[5]

Functional disability refers to motor and cognitive limitations that culminate in difficulty or need for help to perform activities of daily living (ADLs). In the context of stroke, these restrictions commonly interfere with self-care, social interaction, the development of family role and at work,[6] in addition to predisposing emotional problems, which can cease or overload the adaptive resources of survivors in the face of changes, culminating in stress.[7]

Stress is the individual result of the interaction between a person and environmental, psychological or biological tensions. Stress occurs when it is perceived that the resources to face or respond to a threat are incipient.[8] In this relationship, it is not the intensity of the phenomenon that makes it a stressor, but the way in which it is judged by individuals.[7] From the perspective of stroke, if facing the adversities inherent to this morbidity is positive,

stress can be reduced and even eliminated, if not, it can intensify, generating compromises in quality of life (QoL).[9]

The QoL construct has been the focus of studies among stroke survivors. A reduction in QoL in this population has been reported by several studies as well as an impairment in health-related quality of life (HRQoL).[10-12] The World Health Organization defines QoL as individuals' perception of themselves in the cultural and social context and in relation to their goals, expectations, wishes and desires. In contrast, HRQoL refers to the understanding of how the disease impacts their living conditions.[13]

Research carried out with this population showed that the repercussions of stroke can affect several domains of specific HRQOL, such as mood, personality, self-care, social and family roles, memory, upper extremity functions, vision, work/ productivity, energy, language, and mobility.[10-12] Among the factors related to HRQOL, an investigation carried out in Taiwan pointed out functional disability and the impairment of psychosocial aspects as predictors of low HRQOL in stroke victims.[10]

In this context, the magnitude of stroke repercussions for society places it as an important public health problem worldwide.[1] Its high prevalence, risk of death, sequel and changes in survivors' daily lives boost scientific production on this topic. However, there are few studies that address the relationship between functional capacity, perceived stress and specific HRQoL in this population. Evidencing this relationship can contribute to directing health professionals, including nurses, to plan and implement interventions that mitigate the

negative impact of stroke on the lives of affected people, thus reducing dependencies and perceived stress, favoring HRQoL.

Considering the aspects addressed, this study aims to correlate the functional capacity and perceived stress with the HRQoL of stroke survivors.

Methods

This is a cross-sectional analytical study, with a quantitative approach, conducted with people who suffered a stroke, registered in Family Health Units (FHU), in the city of João Pessoa-PB, Brazil, between July and November 2018.

The sample was calculated from the total number of admissions in the last six months prior to collection, in the hospital network of the Unified Health System (SUS - *Sistema Único de Saúde*) in that municipality, which corresponded to 231 admissions, according to information from the Department of Informatics.[14] The sample size was defined using the calculation for a finite population with known proportions, based on a 95% confidence interval (α=0.05), estimated prevalence of 50% (p=0.50) and a margin of error of 5% (Error=0.05), corresponding to a minimum sample of 146 individuals. 10% was added for possible losses or refusals, totaling 160 participants.

People assisted in one of the selected Family Health Teams (FHS), with stroke for three months or more, who presented at least one type of sequel from the stroke and age equal to or over 18 years old were included. Neurological comorbidity, aphasia, significant hearing loss that could impede the compression of the questionnaires, and cognitive deficits assessed by the Mini Mental State Examination (MMSE) were excluded.[15]

The municipality of João Pessoa-PB has 200 FHS. The choice of FHS to gather participants was made through a draw that selected eight teams among the five Health Districts of that municipality, totaling 40 FHS drawn. To select the participants, the nurses of the selected teams were asked to list all registered people with stroke sequel and, based on this list, a draw of four participants per team was

carried out. Subsequently, the Community Health Worker (CHW) in the area was previously contacted with those selected to invite them to participate in the research and schedule the best time to apply the instruments.

To obtain the sociodemographic and clinical data of the study participants, a semi-structured instrument was used. Functional capacity was investigated using the Barthel Index, which assesses the level of care required by an individual who has some type of disability. This instrument assesses 10 items related to intestinal and bladder sphincters control, ability to perform personal hygiene, use the bathroom, eat, transfer from chair to bed, walk, dress, climb stairs and shower. Each answer has a specific score, with a total value from 0 to 100 points.[16] In this study, the following classification was considered: independent (100 points), mild dependence (91 to 99 points), moderate dependence (61 to 90 points), severe dependence (21 to 60 points) and total dependence (0 to 20 points).[17]

The stress experienced after a stroke was assessed using the 10-item Perceived Stress Scale (PSS-10). Each item consists of statements scored according to how often they occur, receiving a score ranging from 0 to 4. Positive questions (4, 5, 7 and 8) have their added score inverted, as follows: 0=4, 1=3, 2=2, 3=1, 4=0. Negative questions must be added directly. Total scores can range from 0 to 40, higher scores suggest higher levels of stress.[18]

As the scale does not present a specific classification for stress levels, in this study, the minimum and maximum values shown by participants (8 and 35 points, respectively) were used and distributed in the form of quartiles. In this type of calculation, values are divided into four equal parts of 25%, where quartile 1 (Q1 - 18 points) corresponds to the 25% of lowest values, quartile 2 (Q2 - 21 points) delimits the 50% of values and quartile 3 (Q3 – 25 points) covers 25% of higher values. Thus, means were classified as low (Q1), moderate (Q2), and high (Q3).

For assessment of specific HRQoL after stroke, the Stroke Specific Quality of Life Scale (SSQOL) was applied. It is a questionnaire that has 49 items, distributed in 12 domains: energy, family role, language, mobility, mood, personality, self-care, social

role, reasoning, upper extremity function, vision, and work/productivity. The answers are quantified on a Linkert-type scale ranging from 1 to 5 points, the total score ranging from 49 to 245.[19] For the classification of HRQoL, scores below 60% were defined as low HRQOL (147 points) of the maximum score of the SSQOL.[11]

Data were stored in an electronic spreadsheet, structured in the Microsoft Excel Program with double entry. Later, they were imported into the Statistical Package for Social Sciences (SPSS), version 22.0 and analyzed using descriptive and exploratory statistics.

To verify the assumption of normality, the Kolmogorov-Smirnov test was used and it was found that functional capacity, perceived stress, HRQoL and its domains presented non-normal distribution. To correlate, Spearman's correlation test was applied because they are non-parametric variables, with classification of the magnitude of the correlations being weak if $|r| < 0.3$, moderate if $0.3 \leq |r| < 0.7$, and strong if $|r| \geq 0.7$.[20] A statistically significant association was considered when $p \leq 0.05$.

Instrument reliability was assessed by estimating the internal consistency through Cronbach's alpha coefficient, whose value ranges from 0.0 to 1.0, values ≥ 0.70 were considered as reliable.[21]

The research was developed according to the ethical aspects involving human beings, recommended by Resolution 466/2012 of the Brazilian National Health Council (*Conselho Nacional de Saúde*). It was approved by the Institutional Review Board of the Health Sciences Center of *Universidade Federal da Paraíba*, according to Opinion 2.994.882 (CAAE (*Certificado de Apresentação para Apreciação Ética* - Certificate of Presentation for Ethical Consideration) 91360718.1.0000.5188).

Results

In the distribution of sociodemographic data, it was observed that 51.3% were male, 83.8% reported age group of 60 years or more, 60.6% were married, 48.1% had one to four years of education and 122 (76.3%) with family income from one to three minimum wages. Regarding stroke characteristics, most suffered the last stroke more than a year ago (63.1%), of ischemic type (70.0%), with a predominance of motor sequel (66.3%) and muscle weakness (47.5%). In the assessment of functional capacity, it was identified that 83.7% had some degree of dependence, with a predominance of moderate dependence (47.5%) (Table 1). Regarding perceived stress, an average of 22.05 (SD=±10.92) was identified, showing moderate stress (Table 1).

Table 1. Classification of functional capacity and perceived stress in people with stroke sequel

Classification of functional capacity and perceived stress	n(%)	Mean	SD	Cronbach's alpha
Functional capacity		73.26	25.61	0.91
Total dependence	10(6.3)			
Severe dependence	31(19.4)			
Moderate dependence	76(47.5)			
Mild dependence	17(10.6)			
Independence	26(16.3)			
Perceived stress		22.05	10.92	0.80
Low	39(26.5)			
Moderate	71(48.3)			
High	37(25.2)			

Low post-stroke HRQoL was identified, with a mean of 146.55 (SD=±39.05), Cronbach's alpha value was 0.91. In Table 2, it is observed that the most affected HRQoL domains were social roles (2.10; ±0.74) and family roles (2.26; ±1.09).

Table 2. Health-related quality of life for people with stroke sequel

SSQOL domains	Average score by domain items Mean (SD)
Vision	4.11 (1.01)
Memory	3.39 (0.94)
Self-care	3.37 (1.26)
Language	3.36 (0.78)
Upper extremity function	3.02 (1.14)
Mood	2.91 (1.05)
Mobility	2.79 (1.11)
Personality	2.59 (1.26)
Energy	2.59 (1.25)
Work/productivity	2.53 (1.15)
Family roles	2.26 (1.09)
Social roles	2.10 (2.26)

The correlation of the overall HRQoL score with functional capacity exhibited a strong positive relationship (r=0.705) with statistical significance

(p≤0.05). When analyzing the domains, a strong relationship was evidenced between functional capacity and self-care (r=0.769) and mobility (r=0.752) (Table 3). In investigating the correlation between the overall HRQoL score and perceived stress, a moderate, negative and inversely proportional relationship (r=-0.436) was observed, with statistical significance (p≤0.05). A strong negative and inversely proportional correlation was identified between perceived stress and personality (r=-0.708) (Table 3).

Table 3. Correlation of health-related quality of life with functional capacity and perceived stress in people with stroke sequel

Domains SSQOL	Functional capacity		Perceived stress	
	r	p-value*	r	p-value*
Mood	0.465	<0.001	-0.462	<0.001
Personality	0.291	<0.001	-0.708	<0.001
Self-care	0.769	<0.001	-0.297	<0.001
Social roles	0.443	<0.001	-0.403	<0.001
Memory	0.368	<0.001	-0.238	0.002
Upper extremity function	0.627	<0.001	-0.256	<0.001
Vision	0.218	0.006	-0.091	0.254
Work/productivity	0.620	<0.001	-0.213	0.007
Energy	0.409	<0.001	-0.556	<0.001
Language	0.433	<0.001	-0.217	0.006
Family roles	0.489	<0.001	-0.280	<0.001
Mobility	0.752	<0.001	-0.304	<0.001
SSQOL	0.705	<0.001	-0.436	<0.001

*Spearman's correlation test

Discussion

The present study identified a predominance of moderate functional dependence. Functional impairments in stroke survivors result from the sequel of this event.[5] Studies show that most people affected by this morbidity live with some functional impairment, which interferes with the performance of ADLs, with negative consequences in biopsychosocial aspects.[6,22]

Assessment and periodic monitoring of functional capacity are essential to identify the functional profile of each patient, which supports the development of a systemic and individualized care plan, with strategies for effective clinical decision-making;[22,23] consequently, it contributes to the rehabilitation process, since there are limitations that can be mitigated or eliminated.[5]

In measuring perceived stress, a moderate level was identified. A similar finding was observed in a research carried out in the United States of America (USA), with victims of stroke living in the community, which obtained an average stress in the EEP-10 of 22.23 (±9.50).[24] Stroke is characterized as an aggravation of sudden onset, in which the survivor moves into a state of illness, establishing a new phase of adaptations.[6] The perception of a change in routine and the inability to perform activities that were previously common and can lead to a feeling of powerlessness and cause stress.[25]

When stress lasts for a long period, it affects physical, social and emotional aspects, which can contribute to the development of new diseases.[26] High levels of stress increase the risk of new episodes of stroke, in addition to predisposing risk factors such as hypertension, diabetes mellitus and obesity.[27]

In the assessment of HRQoL after a stroke, participants had low scores. A survey conducted in a city in the northeast, with 104 people with stroke sequel, showed an approximate result (146.80±36.3).[11] Compromised HRQOL can affect several domains such as mood, personality, self-care, memory, upper extremity functions, vision, work, energy, mobility, and social and family roles.[12] Thus, HRQoL assessment is characterized as a tool that helps to draw a multidimensional profile related to the health of stroke patients, directing treatment and contributing to improvements in quality of care.[11,12]

In HRQoL domains, the most affected were social roles and family roles, converging with national and international studies.[10-12] This finding can be justified by the predominance of elderly people in the sample and high functional impairment, given that the elderly tends more to isolation and the sequel resulting from stroke are generally disabling and impair the return of the victim to their social activities, such as work, leisure with family members and socializing with friends.[28]

In this study, functional capacity was identified as a strong factor correlated with HRQoL, demonstrating that the more functionally independent a person with stroke sequel is, the higher their HRQoL. Studies have shown functional capacity as

one of the main determinants of HRQoL.[5,11,12] A cross-sectional research carried out in the Republic of Korea, which sought to relate the ADLs and the HRQoL of patients with chronic stroke, showed a strong positive statistical correlation (r=0.800; p=<0.001) between the functional capacity and the total score of the SSQOL, indicating convergence with the results of this study.[29]

In the correlation with the domains, a strong relationship between functional capacity and self-care and mobility was evidenced. The mobility domain refers to issues related to balance, climbing stairs, physical fatigue, difficulty walking, standing up and getting up from a chair.[19] However, the self-care domain covers aspects related to personal care, such as preparing food, helping to eat, dressing, bathing and using the toilet.[19] The effectiveness in carrying out these activities is directly influenced by functional capacity.[5]

Another factor correlated with HRQoL in people with stroke sequel, in this study, was perceived stress. An inversely proportional correlation was found, in which the lower the stress of people with stroke sequel, the higher the HRQoL. Stress has been frequently investigated among caregivers of stroke victims,[30] yet among survivors themselves, publications are scarce.

The negative repercussions of stroke can bring several unexpected challenges to survivors' lives, causing stress. Coping unfavorably with important events such as stroke can lead to the perception that life is unpredictable, uncontrollable and overloaded,[9] in addition to interfering with the ability to deal with daily life, hindering reintegration in the community and contributing to the development of diseases,[27] reverberating negatively on HRQoL.

In this study, a strong and inversely proportional correlation was evidenced between stress and the personality domain. This is composed of questions related to irritability, impatience and personality change,[19] constituting behaviors that can be potentiated by stress, given that, if the state of stress persists, it can interfere in the way individuals interact, causing maladjustments in behavior, which influences the different areas of life.[26]

Therefore, in order to favor adaptation to the changes caused by stroke, it is essential that nurses intervene with survivors and their family through a care plan, including actions such as: determine the knowledge and skill of patients and caregivers; help patients and families to identify coping strategies for stressful situations;[9] assist in the identification of available support systems; connect patients and families to community resources; promote the maximum of independence and self-care; perform an assessment of the home environment; and recommend adaptations in the home to promote physical self-confidence.[31]

Limitations refer to the cross-sectional design for not allowing the cause and effect relationship between variables and the exclusion of people with neurological comorbidities, aphasia, significant hearing loss and cognitive deficits, which makes it impossible to generalize the results. Longitudinal studies are recommended to assess functional capacity, perceived stress and HRQoL at each stage in the rehabilitation process of stroke sequel.

Conclusion

Based on the results of this study, moderate functional dependence and perceived stress and low HRQoL were observed, with greater impairment in the social roles and family roles domains. HRQoL was statistically correlated between functional capacity and perceived stress, demonstrating that the HRQoL of people with stroke sequel increases as functionality increases and stress decreases. These findings are useful, as they represent relevant data for reflections on the factors that enhance the negative impact of stroke on victims' survival. It is important to consider the results of this study for the benefit of this population, using them as a guide for planning biopsychosocial interventions that can effectively intervene in disabilities, perceived stress and compromised HRQoL domains. In addition to providing subsidies for the development of public policies and health management.

Collaborations

References

1. Russell JB, Charles E, Conteh V, Lisk DR. Risk factors, clinical outcomes and predictors of stroke mortality in Sierra Leoneans: a retrospective hospital cohort study. Ann Med Surg (Lond). 2020;60:293-300.

2. de Santana NM, Dos Santos Figueiredo FW, de Melo Lucena DM, Soares FM, Adami F, de Carvalho Pádua Cardoso L, et al. The burden of stroke in Brazil in 2016: an analysis of the Global Burden of Disease study findings. BMC Res Notes. 2018;11(1):735.

3. Romain G, Mariet AS, Jooste V, Duloquin G, Thomas Q, Durier J, et al. Long-term relative survival after stroke: the dijon stroke registry. Neuroepidemiology. 2020;54(6):498-505.

4. Larsen LP, Johnsen SP, Andersen G, Hjollund NH. Determinants of health status after stroke: a cohort study with repeated measurements. Clin Epidemiol. 2020;12:1269-79.

5. Han DS, Chuang PW, Chiu EC. Effect of home-based reablement program on improving activities of daily living for patients with stroke: a pilot study. Medicine (Baltimore). 2020;99(49):e23512.

6. Faria AC, Martins MM, Schoeller SD, Matos LO. Care path of person with stroke: from onset to rehabilitation. Rev Bras Enferm. 2017;70(3):495-503.

7. Hinwood M, Ilicic M, Gyawali P, Kluge MG, Coupland K, Smith A, et al. Exploration of stress management interventions to address psychological stress in stroke survivors: a protocol for a scoping review. BMJ Open. 2020;10(3):e035592.

8. Gyawali P, Chow WZ, Hinwood M, Kluge M, English C, Ong LK, et al. Opposing associations of stress and resilience with functional outcomes in stroke survivors in the chronic phase of stroke: a cross-sectional study. Front Neurol. 2020;11:230.

9. Dos Santos EB, Rodrigues RA, Fhon JR, Haas VJ. Changes and predictors of psychological stress among elderly stroke survivors 6 months after hospital discharge. Stress Health. 2018;34(3):359-66.

10. Chou CY. Determinants of the health-related quality of life for stroke survivors. J Stroke Cerebrovasc Dis. 2015;24(3):655-62.

11. Canuto MA, Nogueira LT, Araújo TM. Health-related quality of life after stroke. Acta Paul Enferm. 2016;29(3):245-52.

12. Ramos-Lima MJ, Brasileiro IC, Lima TL, Braga-Neto P. Quality of life after stroke: impact of clinical and sociodemographic factors. Clinics (Sao Paulo). 2018;73:e418.

13. The World Health Organization Quality of Life assessment (WHOQOL): position paper from the World Health Organization. Soc Sci Med. 1995;41(10):1403-9.

14. Brasil. Ministério da Saúde. Sistema de informações hospitalares do SUS (DATASUS). Sistema de Informações Hospitalares do SUS (SIHSUS). Brasília (DF): Ministério da Saúde; 2018 [citado 2018 Jun 30]. Disponível em: http://www2.datasus.gov.br/DATASUS/index.php?area=060502

15. Bertolucci PH, Brucki SM, Campacci SR, Juliano Y. O mini-exame do estado mental em uma população geral. Arq Neuro-Psiquiatr.1994;52(1):1-7.

16. Minosso JS, Amendola F, Alvarenga MR, Oliveira MA. Validation of the Barthel Index in elderly patients attended in outpatient clinics, in Brazil. Acta Paul Enferm. 2010;23(2):218-23.

17. Granger CV, Albrecht GL, Hamilton BB. Outcome of comprehensive medical rehabilitation: measurement by PULSES profile and the Barthel Index. Arch Phys Med Rehabil. 1979;60(4):145-54.

18. Luft CD, Sanches SO, Mazo GZ, Andrade A. Versão brasileira da Escala de Estresse Percebido: tradução e validação para idosos. Rev Saúde Pública. 2007;41(4):606-15.

19. Lima RC, Teixeira-Salmela LF, Magalhães LC, Gomes-Neto M. Psychometric properties of the Brazilian version of the Stroke Specifi c Quality of Life Scale: application of the Rasch model. Rev Bras Fisioter. 2008;12(2):149-56.

20. Munro BH. Statistical methods for health care research. 4th ed. Philadelfhia: Lippincott, 2001.

21. Oviedo HC, Campo-Arias A. Aproximación al uso del coeficiente alfa de Cronbach. Rev Colomb Psiquiatr. 2005;4(4):572-79.

22. Lima RJ, Pimenta CJ, Frazão MC, Ferreira GR, Costa TR, Viana LR, et al. Functional capacity and social support to people affected by cerebrovascular accident. Rev Bras Enferm. 2019;72(4):868-73.

23. Pui Kei C, Mohd Nordin NA, Abdul Aziz AF. The effectiveness of home-based therapy on functional outcome, self-efficacy and anxiety among discharged stroke survivors. Medicine (Baltimore). 2020;99(47):e23296.

24. Laures-Gore JS, Defife LC. Perceived stress and depression in left and right hemisphere post-stroke patients. Neuropsychol Rehabil. 2013;23(6):783-97.

25. Alves Silva R, Lima Martins ÁK, Barreto de Castro N, Viana AV, Butcher HK, Martins da Silva V. Analysis of the concept of powerlessness in individuals with stroke. Invest Educ Enferm. 2017;35(3):306-19.

26. Neumark-Sztainer D, Wall MM, Choi J, Barr-Anderson DJ, Telke S, Mason SM. Exposure to adverse events and associations with stress levels and the practice of yoga: survey findings from a population-based study of diverse emerging young adults. J Altern Complement Med. 2020;26(6):482-90.

27. Osborne MT, Shin LM, Mehta NN, Pitman RK, Fayad ZA, Tawakol A. Disentangling the links between psychosocial stress and cardiovascular disease. Circ Cardiovasc Imaging. 2020;13(8):1-6.

28. Das J, Rajanikant GK. Post stroke depression: the sequelae of cerebral stroke. Neurosci Biobehav Rev. 2018;90:104-14. Review.

29. Kim K, Kim YM, Kim EK. Correlation between the activities of daily living of stroke patients in a community setting and their quality of life. J Phys Ther Sci. 2014;26(3):417-9.

30. Costa TF, Bezerra TA, Pimenta CJ, Silva CR, Ferreira GR, Costa KN. Fatores associados à ideação suicida em cuidadores de sobreviventes de acidente vascular encefálico. Rev Rene. 2020;21:e42171.

31. Riegel B, Moser DK, Buck HG, Dickson VV, Dunbar SB, Lee CS, Lennie TA, Lindenfeld J, Mitchell JE, Treat-Jacobson DJ, Webber DE; American Heart Association Council on Cardiovascular and Stroke Nursing; Council on Peripheral Vascular Disease; and Council on Quality of Care and Outcomes Research. Self-Care for the Prevention and Management of Cardiovascular Disease and Stroke: a Scientific Statement for Healthcare Professionals From the American Heart Association. J Am Heart Assoc. 2017;6(9):e006997. Review.