

## Functionality and disability of post cerebral stroke patients: cases report

### Funcionalidade e incapacidade dos pacientes pós-acidente vascular encefálico: relato de casos

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**RESUMO | INTRODUÇÃO:** O Acidente Vascular Encefálico (AVE) é a principal causa de incapacidade neurológica, sendo a hemiparesia a seqüela mais comum da doença. As limitações físicas e funcionais associadas à incapacidade afetam diretamente a funcionalidade dos indivíduos. **OBJETIVO:** Classificar a funcionalidade e incapacidade dos pacientes pós-AVE de um serviço público de fisioterapia em Teresina. **MATERIAIS E MÉTODOS:** Trata-se de relato de casos, de caráter descritivo e quantitativo com a amostra de sete participantes atendidos em um serviço público de fisioterapia em Teresina, os dados foram coletados no período de outubro de 2016 a fevereiro de 2017. O instrumento utilizado para a coleta de dados foi uma ficha de avaliação, elaborada pelos autores da pesquisa, contendo dados sobre o diagnóstico clínico, tempo de lesão e semiologia neurológica. Os itens da Classificação Internacional de Funcionalidade, Incapacidade e Saúde (CIF) selecionados para elaboração do presente estudo foram: funções neuromusculares relacionadas com o movimento (b7), atividades e participação (d3), mobilidade (d4) e autocuidado (d5). **RESULTADOS:** Constatou-se maior comprometimento nas funções neuromusculares relacionadas à força e resistência, apresentando deficiência grave. Em relação, ao domínio atividade e participação os participantes mostraram-se com dificuldade moderada. **CONCLUSÃO:** Este estudo verificou que a maioria dos participantes apresenta implicações nas suas funções estruturais e funcionais, que os limitam a realizar as atividades de mobilidade, incapacitando na participação das atividades diárias.

**PALAVRAS-CHAVE:** Classificação internacional de funcionalidade. Incapacidade e saúde. Fisioterapia. Acidente vascular encefálico.

**ABSTRACT | INTRODUCTION:** Stroke is the main cause of neurological incapacity, and hemiparesis is the most common sequel of the disease. The physical and functional limitations, associated with disability, directly affect the functionality of individuals. **OBJECTIVE:** To classify the functionality and disability of post-stroke patients of a public physiotherapy service in Teresina. **MATERIALS AND METHODS:** This is a descriptive and quantitative case report with a sample of seven participants seen at a public physiotherapy service in Teresina. Data were collected from October 2016 to February 2017. The instrument used for data collection was an evaluation form, prepared by the authors of the research, consisting of data on clinical diagnosis, time of injury and neurological semiology. The items of the International Classification of Functioning, Disability and Health (CIF) selected for the present study were: neuromusculoskeletal functions related to movement (b7), activities and participation (d3), mobility (d4) and self care (d5). **RESULTS:** A greater impairment in neuromusculoskeletal functions related to strength and resistance was observed, presenting severe deficiency. Considering the domain activity and participation, the participants showed moderate difficulty. **CONCLUSION:** This study found that most of the participants have implications for their structural and functional functions, which limit them to perform mobility activities, disabling them to participate in daily activities.

**KEYWORDS:** International classification of functioning. Disability and health. Physical therapy. Stroke.

## Introduction

Stroke is one of the main noncommunicable diseases of public health importance. It occurs due to localized cerebral ischemia correlated with focal occlusion of the cerebral blood vessel (ischemic stroke) or due to hemorrhage (haemorrhagic stroke)<sup>1</sup>. In Brazil, between 2008 and 2011, there were 424,859 hospitalizations of elderly people aged over 60 who have suffered from stroke, is highly prevalent and is commonly associated with high rates of morbidity and disability that result in different public health problems<sup>2,3</sup>.

Inability refers to the biological consequence of the malfunctioning of the organism (restrictions on performing activities), and functionality is the term for functions and structures of the body that can positively relate to other individuals. Therefore, there is a dynamic interaction between health conditions (illness, trauma, injuries and disorders) and contextual factors (including personal and environmental factors)<sup>3</sup>.

The attention of the disabled person has modified the health scenario in Brazil, considering the growing number of public policies focused on the functionality and disability of people with special needs<sup>4</sup>. In this context, it is common practice in physiotherapeutic practice to use evaluative tools that help the professional to identify the functional deficits caused by the disease, in order to plan the most viable therapy for rehabilitation or minimization of sequelae<sup>5</sup>. Therapists tend to focus on assessing the impairment of body functions and structures; however, for good health, the individual should be able to actively take action and participate in all aspects of daily life such as family relationships and community activities<sup>6,7</sup>.

The International Classification of Functioning, Disability and Health (CIF) was approved by the World Health Organization (WHO) in 2001, and depicts a functional model from a classification system, where the various health dimensions are integrated by an approach biopsychosocial<sup>7</sup>. From this perspective, the CIF model reflects how the level of health of a population is presented by analyzing the relationships and the context where the person with special needs is inserted<sup>8</sup>.

The human function and disability model makes it possible to reduce the existing gap in the literature, in relation to the description of the specific functional profile of the patient, during their evaluation and intervention. The study is justified by the fact that the structure and content of the ICF are able to assist physiotherapists in the recording of functional data, definition of intervention targets and documentation of outcomes, allowing the adoption of a model to guide the clinical practice of the point of biopsychosocial view, being indispensable for rehabilitation, since it favors the allocation of resources compatible with the real needs of the individual<sup>7,9</sup>.

This classification may help in the therapeutic behavior, because the patient's functionality becomes a health component and not only a consequence of the disease, thus performing the treatment with a focus on the functions and restrictions presented by the patients<sup>9</sup>. Therefore, the objective of this study is to classify the functionality and disability of post-stroke patients of a public physiotherapy service in Teresina.

## Methods

The research consists of an account of descriptive and quantitative cases, involving individuals aged over 18 years and diagnosed of stroke, attended at a public physiotherapy service in Teresina, performed according to the following ethical aspects: agreement to participate in the study, signing of the free and informed consent form, according to Resolution 466/2012 of the National Health Council, which establishes human rights in individuals in health experiences. The research was submitted to the evaluation by the Ethics and Research Committee of the State University of Piauí (UESPI), and CAAE 60455216.3.0000.5209 was approved.

The sample was for convenience, composed of the patients followed in the neurological physiotherapy sector with diagnosis of stroke. Data were collected between October 2016 and February 2017, according to inclusion criteria: age equal to or greater than 18 years of both genders, with clinical diagnosis of stroke and less than 10 years of injury.

Patients who had difficulty understanding were excluded and refused to perform or respond to any examination during the evaluation (information related to self-care).

The instrument used for the data collection was an evaluation form, elaborated by the authors of the research and applied by them, containing data on clinical diagnosis, time of injury and neurological semiology, based on the ICF. During the anamnesis the self-care and hemibody most affected by the lesion were evaluated. The semiology was performed by a single evaluator and data were collected on muscle tone (hypertonia in one or more limbs), postural changes (lying down, sitting and passing to orthostatism), walking (walking short, long distances, walking on unstable surfaces, and overcome obstacles), motor coordination, muscle strength, and mobility of the joints. The parameters obtained in the evaluation were quantified by the CIF qualifiers that denote the magnitude of the problem, including three chapters and 19 categories. The evaluation occurred at the time of service, lasting 20 to 30 minutes in a way that did not affect the treatment.

The CIF classification maintains a hierarchy that uses an alphanumeric system. The letters b, s, d, and, indicate body functions, body structures, activities and participation, and environmental factors, respectively. The letters are followed by a code that begins with the chapter number (one digit), followed by the second level (two digits), the third level (one digit) and the fourth level (one digit).

For the code to be complete a "qualifier" is required, which indicates the magnitude of the health level, which is represented by one or more numbers placed after the code and separated by a period. The level (0) represents no problem, (1) light problem, (2) moderate problem, (3) serious problem, (4) total problem. The CIF items selected for this study were neuromusculoskeletal functions related to movement (b7), activities and participation (d3), mobility (d4) and self-care (d5)<sup>8</sup>.

For the data analysis, descriptive statistics (percentage) were performed using the SPSS 18.0 program.

## Results

The sample consisted of seven participants, five men and two women with ages ranging from 48 to 82 years, 71% over 60 years. As for the age group of people with a stroke sequel, the mean was 64.14 (SD = 9.68 years) as well as the hemibody most affected after the injury was the left one. Table 01 describes neuromusculoskeletal functions related to movement and mobility, muscle strength, resistance, tone, control of voluntary movement and gait patterns.

**Table 1.** Percentage distribution of the classification of the participants regarding neuromusculoskeletal functions and related to the movement of post-stroke patients. Teresina-2018

	Qualifiers (%)				
	0	1	2	3	4
b710 Mobility of joints	-	-	29	42	29
b730 Muscle power	-	-	14	72	14
b740 Muscle endurance	-	-	14	72	14
b735 Muscle tone	-	-	43	57	-
b760 Control of voluntary movement functions	-	-	29	42	29
b770 Gait pattern functions	-	-	29	57	14

Legend: 0 = No disability; 1 = mild deficiency; 2 = Moderate deficiency; 3 = Severe deficiency; 4 = Complete disability.

In Table 02, the components of CIF activity and participation, including mobility and self-care, were analyzed. Activity is the execution of a task or action by an individual, while participation is involvement in a life situation.

**Table 2.** Percentage distribution of the classification of the participants regarding the activity and participation of post-stroke patients. Teresina-2018

		Qualifiers (%)				
		0	1	2	3	4
<b>Mobility</b>	d410 Changing basic body position	14	14	14	44	14
	d420 Transferring oneself	-	14	29	43	14
	d430 Lifting and carrying objects	-	-	29	14	57
	d435 Moving objects with lower extremities	14	-	43	29	14
	d440 Fine hand use	-	-	29	-	71
	d445 Hand and arm use	-	-	29	-	71
	d450 Walking	-	14	43	29	14
<b>Self-care</b>	d510 Washing oneself	-	29	57	-	14
	d520 Caring for body parts	-	29	43	14	14
	d540 Dressing	-	13	29	29	29
	d550 Eating	-	29	44	-	29
	d560 Drinking	-	28	43	-	29
	d570 Looking after one's health	-	14	43	29	14

Legend: 0 = No disability; 1 = mild deficiency; 2 = Moderate deficiency; 3 = Severe deficiency; 4 = Complete disability.

## Discussion

The AVE presents a higher risk after 65 years of age, doubling every decade after 55 years and there is a prevalence in males<sup>10</sup>. In the present study, 71% of the sample consisted of males and 71% were aged > 60 years. These data are concordant in the literature<sup>3</sup>, identified a progressive increase with age, 2, 3% in the age group of 60-69 years, 3.9% in the range of 70-79 years and reaching 6.8% among the elderly with ≥ 80 years. The results regarding the hemicorp most affected after stroke showed a predominance of left hemiparesis (57%), giving a higher prevalence of lesion in the right hemisphere. The findings of this research agree with the results of Santana et al.<sup>11</sup>, in relation to age and gender, but refute in relation to the predominance of hemiparesis, indicating results with right hemiparesis (48%).

The functionality approach has often been inserted in the literature in recent years, although there are few studies that discuss the issue of patient perception<sup>12</sup>.

The determination of the factors influencing the functionality and disability has the personal and social resources, in this sense it is necessary not only to evaluate functional deficit, but to understand how the disabilities are experienced<sup>13,14</sup>.

In this study, there was a prevalence of severe difficulty (qualifiers 3) observed in the majority of participants regarding neuromusculoskeletal functions. The components that had the greatest impairment were strength (b730) and resistance (b740), representing 72% of the study participants; the difficulties reported in this category were related to the mobility of a hemibody in maintaining muscle contraction for a certain time. Oliveira et al.<sup>15</sup> demonstrated in their study that motor alterations such as muscle weakness, spasticity and abnormal movement patterns restrict functional mobility, hampering activities of daily living.

In the function category of the voluntary movement control (b760), which is related to dysdiadochokinesia, the participants presented complete impairment, where 29% were unable to perform alternate

movements with the hands. In other studies<sup>16,17</sup>, an increased probability of referral of the patient to rehabilitation was observed due to muscle tone-related disability and control of voluntary movements. When organizing rehabilitation services, it is extremely important to emphasize this dimension to address the patient's motor function issues in a therapeutic way.

Adequate functional movement for the upper limb requires motor performance that involves reaching, targeting, gripping and manipulation of objects<sup>18</sup>. Analyzing the results regarding mobility in this study, the most difficult items were the use of fine movements with the hands (d440) and hand and arm use (d445), showing 72% with complete problem, participants reported complexity in performing activities that require control of both fine tweezers and synergetic movements of the upper limbs. Other authors corroborate these results indicating that these changes have implications for the lives of post-stroke patients<sup>11,19</sup>. In relation to lifting and transporting objects (d430) participants reported complete difficulty (57%) in using their hands and arms to lift objects and move them in place. This inability is justified by the difficulty of the hemiplegic to bear weight on the affected limb, which hinders postural control and generates difficulties in the performance of trunk and limb movements<sup>20</sup>.

In relation to the autotransferences (d420) and to change the basic position of the body (d410), the participants had serious difficulty in moving from one surface to another without changing the basic position of the body. A percentage of 43% classified items moving objects with the lower limbs (d435) and walking (d450) as moderate, where they pointed out difficulties in deflecting obstacles, especially when walking in the streets because of the difference in leveling of the pavement. The study by Hoyas et al.<sup>21</sup> found that if the person can independently move, eat, transfer and climb ladders autonomously, the level of independence will positively affect the rest of the person's occupational aspects (self-care, instrumental activities and leisure time).

When the categories of the self-care domain were analyzed, it was observed that the majority of participants had moderate difficulty. Regarding the wash category (d510), the participants reported

that they were able to clean the body, but they took more time to perform the activity than before the injury and only 14% reported that they were subject to the release of a caregiver to perform the bath, thus presenting complete difficulty. Ribeiro et al.<sup>22</sup> concluded that the majority of patients with stroke sequelae are dependent on personal hygiene and to wear the lower half of the body, as well as other authors who found in their studies impairment of the CIF Activity and Participation domain<sup>17,19</sup>.

The CIF offers a profile on functional skills and description of health status being a good point of this research. In this way, its characteristics offer a useful tool to conceptually evaluate the diversity of human activity problems arising from cerebrovascular diseases, analyzing from simple to more complex functions, meeting the real needs of the population and identifying the presence of impairment related to functionality and disability<sup>19,23</sup>.

The study had limitations regarding the sample, since the physiotherapy sector was undergoing changes and the patients were adapting to the new hours of care. Another limiting issue is the difficulty in its psychometric characteristics, since the qualifiers of the CIF need standardization. The use of this method is not yet fully operational, although many attempts have already been made to validate the use of operational scales that correlate with CIF. However, such difficulties and obstacles will only be mitigated if practitioners start the practical use of ICF<sup>7,9</sup>. The study used the CIF in a direct way, selecting some chapters related to the theme in order to encourage future research to use the classification in quantitative studies.

## Conclusion

The results of this research showed that the functionality of the participants was very compromised, presenting negative impacts on neuromusculoskeletal functions, mobility and self-care. In this way, one should not only evaluate information about diagnosis, but add information about functionality and disability, allowing a larger and more meaningful image for decision making.

## Contributions of authors

MELO AWS was responsible for the design, design, search and statistical analysis of the research data. PEREIRA TMS was responsible for writing the scientific article. ORSINI M was responsible for drafting the clinical aspects of the introduction. TEIXEIRA S was responsible for interpreting the results. BASTOS VHV was responsible for the design and writing of the study. SILVA JM was responsible for the design, design, search and statistical analysis of the research data.

## Conflicts of interest

No financial, legal or political conflict involving third parties (government, business and private foundations, etc.) was declared for any aspect of the work submitted (including but not limited to grants and funding, advisory council, study design, manuscript preparation, statistical analysis, etc.).

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