

# Clinical validation of nursing outcome mobility in patients with cerebrovascular accidents



*Validação clínica do resultado de enfermagem mobilidade em pacientes com acidente vascular cerebral*

*Validación clínica del resultado de enfermería de la movilidad en pacientes con accidente cerebrovascular*

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## ABSTRACT

**Objective:** To clinically validate the nursing outcome Mobility in patients with cerebrovascular accidents

**Methods:** Descriptive study, conducted in July 2011, with 38 outpatients, in northeastern Brazil. Data collection took place by evaluating two pairs of specialist nurses, where one pair used the instrument containing the constitutive and operational definitions of the indicators and magnitudes of the Mobility Outcome and the other pair without such definitions.

**Results:** When analyzing the evaluations among nurses, all indicators showed significant differences by the Friedman test ( $p < 0.05$ ).

**Conclusion:** The constitutive and operational definitions submitted to the validation process provide greater accuracy in assessing the cerebrovascular accident patient's mobility state.

**Keywords:** Nursing. Stroke. Outcome assessment (Health care).

## RESUMO

**Objetivo:** Validar clinicamente o resultado de enfermagem Mobilidade em pacientes com acidente vascular cerebral.

**Métodos:** Estudo descritivo, desenvolvido em julho de 2011 com 38 pacientes em tratamento ambulatorial, no nordeste do Brasil. A coleta de dados aconteceu por meio da avaliação de duas duplas de enfermeiras especialistas, sendo que uma dupla utilizou o instrumento contendo as definições constitutivas e operacionais dos indicadores e magnitudes do Resultado Mobilidade e a outra dupla sem tais definições.

**Resultados:** Ao analisar as avaliações entre as enfermeiras, todos os indicadores apresentaram diferença significativa pelo teste de Friedman ( $p < 0,05$ ).

**Conclusão:** As definições constitutivas e operacionais submetidas ao processo de validação proporcionam maior acurácia na avaliação do estado de Mobilidade do paciente com acidente vascular cerebral.

**Palavras-chave:** Enfermagem. Acidente vascular cerebral. Avaliação de resultados (Cuidados de saúde).

## RESUMEN

**Objetivo:** Validar clinicamente el resultado de enfermería de la movilidad en pacientes con accidente cerebrovascular.

**Métodos:** Estudio descriptivo se llevó a cabo con 38 pacientes en tratamiento ambulatorio, en el Noreste de Brasil, en julio de 2011. La recolección de datos ocurrió a través de la evaluación de dos parejas de enfermeras especializadas, una pareja utilizó el instrumento que contiene las definiciones constitutivas y operacionales de los indicadores y magnitudes del resultado y otra pareja sin tales definiciones.

**Resultados:** Mediante el análisis de las calificaciones entre las enfermeras, todos los indicadores mostraron diferencias significativas por el test de Friedman ( $p < 0,05$ ).

**Conclusión:** Las definiciones constitutivas y operacionales sometidos a un proceso de validación proporciona una mayor precisión en la evaluación del estado de la movilidad del paciente con accidente cerebrovascular.

**Palabras clave:** Enfermería. Accidente cerebrovascular. Evaluación de resultado (Atención de salud).

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## INTRODUCTION

The Cerebrovascular Accident (CVA) can promote physical, communication, functional and emotional sequelae. It is known that 40 to 50% of individuals who suffer cerebrovascular accidents die during the first months after the event, and most survivors exhibit significant residual neurological deficits and disability<sup>(1)</sup>. Such sequelae involve some degree of dependence, especially in the first year after its occurrence.

Among the most prevalent consequences are the changes in body mobility. In a previous study with 121 patients who survived cerebrovascular accidents and were performing rehabilitation activities, the highlight was the nursing diagnosis of impaired physical mobility as the second most frequent<sup>(2-4)</sup>.

In this context, the restriction of movement in this population is a worrisome factor for the nursing staff. Thus, the interest in continuing this theme and studying the nursing mobility outcome established in the Nursing Outcome Classification – NOC<sup>(5)</sup> in patients who survived a CVA (cerebrovascular accident)

The outcome of the nursing mobility is part of the Functional Health domain and the Mobility class and is characterized by results that describe physical mobility and an individual's restricted mobility sequelae<sup>(5)</sup>. Let it be added that this nursing outcome is one of the main results suggested for the nursing diagnosis Impaired physical mobility.

Among the twelve scales with single measures adopted in the fourth NOC<sup>(2)</sup> taxonomy edition, the Mobility outcome is assessed by the scale that provides a measurement for the degree of commitment observed in an outcome with the following parameters: "Severely compromised", "Substantially compromised", "Moderately compromised", "Slightly compromised" and "Not compromised". This nursing outcome is composed of twelve indicators: Balance; Coordination; Gait; Muscle movement; Joint movement; Performance in positioning the body; Performance in the transfer; To run; Jump; Crawl; Walk; and Movements accomplished with ease. Mobility The ability to move purposefully in the environment itself, independently, with or without an auxiliary device<sup>(5)</sup>.

The assessment from the nursing outcomes identified allows nurses to guide the continuity of the nursing process. One is able to verify if the results were as expected. If so, decide whether the prescription care should remain the same. However, if the results were not those desired, a new plan of care can be traced,

with elimination or addition of new nursing diagnoses and interventions.

It is noteworthy that reliable and valid results are required for the effectiveness of nursing and the effectiveness of research, in order to promote further development of practice based on evidence, and influence the health policy<sup>(5)</sup>. Authors state that the taxonomies of nursing diagnoses, interventions and outcomes, especially NANDA-I, NIC and NOC classifications contain concepts that need to be further studied, which is why the validation process is essential in order to improve them and legitimize them<sup>(6)</sup>.

Thus, when considering the need to make an assessment of the nursing results more accurate, to allow a measurement of the nursing outcome that is more stable and reliable among nurses and to effectively communicate nursing outcome, it has been hypothesized that constitutive and operational definitions that are construed and submitted to the validation process may provide greater accuracy in the health status of the surviving CVA patient,

Constitutive definition provides a variable or concept with connotative meaning (abstract, comprehensive, theoretical), established by concept analysis, concept derivation or concept synthesis<sup>(7)</sup>. The operational definition describes what will be measured and how it will be measured, increases the reliability and validity of the data, facilitates the reproduction of research and gives the researcher report new findings. Moreover, the procedure explains more objectively what is going to be measured or observed<sup>(8)</sup>.

Moreover, it adds that studies of nursing outcomes are still scarce, especially those linked to Mobility in patients with cerebrovascular accidents, which legitimizes the need to carry out investigations in this area.

The following question arose from the foregoing: can the constitutive and operational definitions construed and submitted to the validation process provide greater accuracy in assessing the health status of the patient who survived the cerebrovascular accident?

In face of this, the study aimed to clinically validate the nursing outcome Mobility results in nursing patients with cerebrovascular accidents.

## METHODS

Study from doctoral thesis<sup>(2)</sup> defined in three stages: construction of constitutive and operational definitions for indicators of the nursing outcome Mobility<sup>(3)</sup>; validation of

these definitions by experts in the field<sup>(4)</sup>; clinical validation carried out by nurses with post CVA patients, the central scope of this article.

Transversal and descriptive study. Data collection was carried out in July 2011 in the neurology clinic of a tertiary hospital, and reference for the treatment of people with CVA, located in northeastern Brazil.

The population of patients consisted of those who met the inclusion criteria: a) had presented at least one CVA episode, with physician-confirmed diagnosis; b) could be present in the days established for data collection for consultation at the hospital's neurology clinic; c) have the nursing diagnosis Impaired physical mobility; d) be over 18 years of age. The participant group of the study consisted of 38 patients who met the inclusion criteria during the period of data collection.

It is noteworthy that the identification of the nursing diagnosis Impaired physical mobility was the responsibility of the researcher, in view of his experience and ability in inferring that nursing diagnosis. To this end, an instrument directed to the investigation of nursing diagnoses of the activity / exercise class was used<sup>(9)</sup>.

Then, four nurses, divided into pairs, were selected. The following inclusion criteria were defined for the selection of nurses: a) have more than one year since obtaining their nursing diploma; b) work in clinical practice with patients who had mobility impairments; c) be part of research groups on nursing diagnoses, interventions and outcomes and / or on technologies for nursing care.

After the selection of four nurses, there was a draw for the composition of the evaluating pairs. After the pairs were established, there was another draw to select the instrument used by each pair. Thus, one pair applied the instrument with the constitutive and operational definitions of the Mobility indicators that were construed and validated in the stages prior to the study<sup>(3-4)</sup>. The other pair applied the same instrument without these definitions. An order in which to apply the instruments was not established amongst the pairs. However, as soon as one pair ended the assessment, the other started with the same patient, but in another physical space.

The instruments containing the patient identification data, history of previous diseases, identification of risk indicators, anthropometric measurements record and assessment of the indicators of nursing outcome Mobility. The instruments with the indicators of this result were construed according to the Validation model proposed by Hoskins, the Analysis Concept Model by Walker and Avant, the Integrative Literature Review proposed by Whitemore and

Knafli, the Psychometrics in Pasquali's perspective and the specialist scoring system proposed by Fehring. All methods that guided the construction of the instrument are described in previous studies<sup>(2-4)</sup>.

Furthermore, the records of each reviewer were individual, depriving them of communication with each other. The pairs were free to decide who would lead the patient's evaluation for all indicators, except the Muscle movement indicator. In this case, muscle strength was simultaneously assessed by both nurses in order for it to not be so tiresome and repetitive for the patient.

Data were stored and organized in Excel spreadsheet software, and tabulated with SPSS, version 19.0, and R version 2.10 for submission in absolute and relative frequency, mean, median and standard deviation.

The Friedman test was used to determine the median difference between the four evaluators. In the case of a statistically significant difference, a post-hoc analysis was performed through the method of least significant difference (LSD).

To compare the correlation between assessments by peer evaluators, the intraclass correlation coefficient was estimated. The objective of this analysis was to determine the degree of relationship between the evaluations undertaken between subjects of peers who did or not use the constitutive and operational definitions. This evaluation was done intra-group, ie, only to compare the correlation between evaluators who used the same evaluation strategy.

Approval for the execution of the research by the Ethics in Research Committee of the Federal University of Ceará was obtained, in accordance with the provisions of Resolution 466/2012<sup>(10)</sup> (protocol number 223/10). It is noteworthy that the nurses and the patients were informed about the purpose of the research, agreed to participate and signed the Free and Informed Consent and Informed. It is noteworthy that the Consent Forms of the patients in a situation of substantial decline in their cognitive skills of discernment and motor apparatus of speech was signed by their legal representatives, without suspension of the right to information of the individual, within the limits of its capacity<sup>(10)</sup>.

## ■ RESULTS

Regarding the socio-demographic data, there was a predominance of males (55.3%) and most patients lived with a partner (73.7%). Before the disease, a large portion worked for themselves (63.2%) as: a merchant, carpenter,

mason, house keeper, photographer, among others. After the illness, of the 31 who responded to this question, 54.9% were able to retire or were receiving sick pay.

The variable ages, income and family income among the patients showed an asymmetric distribution ( $p < 0.05$ ). Therefore, half of the study sample had up to 59 years of age, had income of up to five hundred and forty reais and family income of up to one thousand. The average age was 6.55 years old.

Table 1 contains the distribution of the defining characteristics present in patients with cerebrovascular accident that allowed the identification of the Impaired physical mobility nursing diagnosis.

Thirteen defining characteristics were identified in the patients of the study. Of these, Postural instability, Limited capacity to perform gross motor skills and Limited range of motion (94.7% each) stood out in particular.

**Table 1** – Distribution of the defining characteristics of the Impaired physical mobility nursing diagnosis identified in patients with cerebrovascular accident. Fortaleza, 2011

Variables	N	%
Postural instability	36	94.7
Limited ability to perform gross motor skills	36	94.7
Limited range of motion	36	94.7
Limited capacity to perform fine motor skills	28	73.7
Uncoordinated movements	28	73.7
Slow movements	27	71.1
Changes in gait	24	63.2
Difficult to turn around	22	57.9
Decreased reaction time	21	55.3
Uncontrolled movements	20	52.6
Tremor induced by movement	7	18.4
Engages in movement replacements	6	15.8
Dyspnea on exertion	1	2.6

Source: Survey data, 2011.

**Table 2** – Comparison of average posts of mobility nursing outcome indicators among evaluator groups that did not use and those who did use the constitutive and operational definitions. Fortaleza, 2011

Indicators	Evaluators without definitions		Evaluators with definitions		p value	DMS <sup>††</sup>
	1	2	3	4		
balance	2.07	1.86	3.09	2.99	0.000	0.78
Coordination	3.04	2.84	1.95	2.17	0.000	0.78
Gears	3.16	2.66	1.96	2.22	0.000	0.78
Floor	2.96	2.41	2.21	2.42	0.012	0.78
Muscle movement	3.13	3.26	1.75	1.86	0.000	0.78
Joint movement	2.41	2.20	2.83	2.57	0.029	0.78
Performance in body positioning	3.18	3.22	1.86	1.74	0.000	0.78
Performance in transfer	2.28	2.07	3.01	2.64	0.000	0.78

Source: Survey data, 2011.

<sup>††</sup> Minimum significant difference.

**Table 3** – Comparison of average posts of NOC nursing outcome indicators among evaluator groups that did not use and those who did use the constitutive and operational definitions. Fortaleza, 2011

Indicators	Evaluators without definitions			Evaluators with definitions		
	CCI <sup>††</sup>	IC95% <sup>2</sup>	P value	CCI <sup>1</sup>	IC95%	p value
Balance	0.743	0.560 – 0.857	< 0,0001	0.900	0.817-0.947	< 0,0001
Coordination	0.808	0.663-0.895	< 0,0001	0.773	0.607-0.875	< 0,0001
Gears	0.851	0.734-0.920	< 0,0001	0.847	0.727-0.917	< 0,0001
Floor	0.791	0.635-0.885	0.000	0.828	0.696-0.907	0.000
Muscle movement	0.705	0.502-0.834	0.000	0.600	0.353-0.769	0.000
Joint movement	0.654	0.428-0.803	0.000	0.847	0.727-0.917	0.000
Performance in body positioning	0.838	0.712-0.912	0.000	0.895	0.807-0.944	0.000
Performance in transfer	0.819	0.680-0.901	0.000	0.521	0.249-0.718	0.000

Source: Survey data, 2011.

<sup>††</sup> CCI – Intraclass correlation coefficient.

Table 2 shows a comparison between the evaluator groups using the constitutive and operational definitions and those that did not use them.

All indicators presented a significant difference through the Friedman test ( $p < 0.05$ ). Upon post-hoc comparison through calculation of the minimum significant difference, according to what was identified, there was a similarity between the pair of evaluators who used the instrument with the constitutive and operational definitions for all indicators, and the pair that used the instrument without these settings. All nurses had similar values in the intra-group evaluation.

In comparisons between groups, the DMS method has not identified differences in the evaluations for the indicators Walking and Joint movement. For all other indicators, differences were found when comparing the evaluators who used operational definitions with those who did not use such definitions.

Table 3 contains the comparison of average posts between evaluating groups using constitutive and operational definitions and evaluators who did not.

As noted in Table 3, all indicators showed significant differences ( $p < 0.05$ ) for the evaluation between the evaluating pairs. For the Balance, Gait, Joint movement and Performance in positioning indicators, a greater correlation between the evaluators who used definitions by comparing them with those who did not, were identified. As for the Gait, Muscle movement, Coordination and Performance in the transfer indicators, there was greater agreement among the nurses who did not

use the instrument with the constitutive and operational definitions.

## DISCUSSION

This research is relevant to the practice of nursing because, as previously mentioned, there are few studies on the validation of Nursing Outcomes and, more specifically, with a focus on people who survived a CVA.

When assessing the socio-demographic data, other studies with CVA patients found a slight predominance of males<sup>(9,11)</sup>, a higher percentage of young people, with under 60 years of age<sup>(12)</sup> and that living with partners<sup>(11-12)</sup>. This is important because the support of family for the care of people who have had a CVA, in their homes, is a reality.

With regard to education, half of the participants attended school for an average of 6.55 years. Several studies developed with patients with cerebrovascular accidents report a low level of education in this group<sup>(11-13)</sup>.

As for the employment status, as noted in the study, the AVC brought changes, with a decline in working conditions among the patients. Before the CVA, 32 participants worked actively, and six were housewives. After the CVA, of the 31 participants who responded to this item, only five continued to work actively.

Regarding the characteristics of Impaired physical mobility nursing diagnosis, the most frequent were Postural instability, Limited capacity to perform gross motor skills and Limited range of motion.

Of the various motor dysfunctions that result from the cerebral vascular accident, the most obvious is hemiparesis. Regardless of its cause, it is characterized by the loss of motor control in one side of the body. In hemiparesis, there are extremely significant losses of selective activity in the muscles that control the trunk, particularly those responsible for flexion, rotation and lateral flexion<sup>(14)</sup>. In this study, 50% of patients denoted hemiplegia or hemiparesis. The most affected side was the left, in 21 patients.

There is a prevalence of postural deficits in patients with left hemiparesis, as opposed to those with right hemiparesis. According to evidence presented by an experimental clinical study, patients with left hemiparesis have less postural balance sitting and standing compared to others. Nevertheless, regardless of the side, hemiplegias limit or delay the recovery of gait and functional independence. This makes postural control a priority in rehabilitation after the CVA<sup>(15)</sup>.

Regarding the evaluation analysis between pairs of evaluating nurses on the outcome of Nursing mobility, the DMS method did not identify any differences in the evaluations for the Gait and Joint movement indicators. It is possible that such fact is related to the ease and frequency of the evaluation of these two indicators, in different clinical settings. It should be noted, however, that these two indicators were recommended by experts in the second stage of the research<sup>(4)</sup> as important for the assessment of patients with CVA.

For the remaining indicators, differences were observed when comparing the evaluations carried out from the instrument containing the definitions with those without the conceptual and operational definitions. In this case, this difference can be attributed to the parameters described for each magnitude of the indicator, facilitating the definition and the cutoff assigned to differentiate them, for example, between slightly compromised or moderately compromised.

On the other hand, the fact that the group did not use the instrument with the settings have shown better performance for some indicators, is questioning the appropriateness and applicability of these definitions in clinical practice.

Regarding the Muscle movement indicator, the fact that the pair that had the instrument containing the constitutive and operational definitions have shown a lower correlation for this indicator can be attributed to the difficulty for evaluators to realize the difference between the degree of muscle strength. This can be diffi-

cult in the choice of the scale value from 1 to 5 in the operational magnitude, as their definitions have been construed based on the degree of muscle strength. Therefore, it is necessary to revise this indicator. It was deemed that this indicator was different from the Joint movement indicator and, therefore, it was decided that it should be kept with the necessary suggestions from experts. However, the operational definition of this indicator should be reassessed.

In the case of the Performance in the transfer indicator, there was little suggestion on the part of specialists and all were accepted, even they considered this indicator as one of the most important in the evaluation of patients with CVA. The fact that nurses without definitions have presented greater concordance for all statistical tests performed in this study, however, draws attention. This probably stems from the fact that the indicators are common and applied in different clinical settings. For the Coordination indicator, it was suggested that the portion of the fine motor skills be added. The suggestion was also accepted.

When providing a general analysis, the use of the instrument with the constitutive and operational definitions to apply at least one of the statistical tests was better for most indicators. Thus, although more research is needed using this instrument in the clinical context of the patient with CVA, the study focus has allowed a preliminary analysis summarized as follows: the use of an instrument with constitutive and operational definitions facilitates the evaluation uniformity among nurses.

In research on the validation of the nursing outcome tissue integrity with patients with venous ulcers, as was found, the application of the operational definitions developed provided more uniform assessments among nurses for most indicators of the studied outcome<sup>(16)</sup>.

A similar result was found in another study on the validation of nursing outcome inefficient respiratory pattern in children with congenital cardiopath n evaluation instrument ineffective breathing pattern nursing outcome in children with congenital cardiomyopathy in which the thesis that the development of operational definitions makes the nursing outcome assessment more accurate when performed without operating definitions was proved<sup>(17)</sup>.

As evidenced, there are few studies on nursing outcomes and even less research on the validation with nursing outcomes. Work on the nursing outcome Mobility were also not identified. Such limitation makes comparison and

evaluation of results presented in the research in focus more difficult.

Generally, it is suggested that further studies be carried out, applying the instrument with the constitutive and operational definitions created and validated in this research for the improvement of this instrument. For this, it is essential not only to compare the nurses who used the instrument with and without the definitions, but also to assess the feasibility of each indicator and its respective definition built when applying it at the clinic.

## ■ CONCLUSION

When analyzing the evaluations among nurses, all indicators showed significant differences by the Friedman test ( $p < 0.05$ ). In post-hoc comparison through calculation of the minimum significant difference, it was identified that there was a similarity between the pair of evaluators who used the instrument with the constitutive and operational definitions for all indicators, and the pair that used the instrument without these settings. Also, all indicators showed significant differences ( $p < 0.05$ ) for evaluation between the evaluating pairs when analyzing the intraclass correlation coefficient.

In comparisons between groups, the DMS method has not identified differences in the evaluations for the indicators Walking and Joint movement. For all other indicators, there were differences when comparing the evaluators who used operational definitions with those who did not use such definitions.

By analyzing the Intraclass Correlation Coefficient for the Balance, Gait, Joint movement and Performance in positioning, indicators, a greater correlation between evaluators who used the definitions when compared with those who did not was noticed. As for the Gait, Muscle movement, Coordination and Performance in the transfer indicators, there was greater agreement among the nurses who did not use the definitions. Thus, the development of further studies to test if the definitions created for these indicators are actually appropriate is required.

For most indicators, it was better to use the instrument with the constitutive and operational definitions when applying at least one of the two statistical tests: the Friedman test or the Intraclass Correlation Coefficient test.

It is worth mentioning some difficulties in the implementation of this research, such as the lack of studies on nursing outcome validation, especially Mobility. A fact that

complicates determining the appropriate collection method, as well as the discussion of the results.

The indicators deemed as not suitable for patients who have CVA may be important in evaluating another specific population. However, this study has the peculiarity of having been carried out only with a specific clientele, which does not invalidate its importance. Thus, carrying out other research validation with the nursing outcome Mobility, both in CVA patients and those in other clinical situations is recommended, as the reliability and viability of the instrument require a continuous study process.

However, this research contributes to the nursing practice by making it possible to validate an instrument that can be applied in the care of patients with CVA and can be used for teaching.

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