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# Clinical validation of the nursing outcome falls prevention behavior in people with stroke

Alice G. de Sousa Costa [a,*], Thelma Leite de Araujo [b], Tahissa Frota Cavalcante [c], Marcos V. Oliveira Lopes [b], Ana R. de Souza Oliveira-Kumakura [d], Francisca B. Chaves Costa [e]

[a] OMNI College, Vancouver, 8788 McKim Way, V6X 4E2, Richmond, BC, Canada
[b] Department of Nursing, Federal University of Ceará, Fortaleza, Ceará, Brazil
[c] Department of Nursing, University of International Integration of African-Brazilian Lusophone, Redenção, Ceará, Brazil
[d] Department of Nursing, State University of Campinas, Campinas, São Paulo, Brazil
[e] University of Fortaleza, Fortaleza, Ceará, Brazil

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ABSTRACT

*Purpose:* To review the nursing outcome, *Fall Prevention Behavior*, and clinically validate its indicators in people with stroke.
*Methods:* A methodological study performed with 106 patients in two outpatient clinics, from July to September of 2013. Two pairs of trained nurses applied the NOC scale, one with and one without the use of operational definitions. The internal consistency, stability and difference between the medians obtained by nurses were compared within and between pairs.
*Results:* Most participants were men, elderly, with low education and income. Statistically significant differences were noted in twelve indicators. Five indicators had different means that were greater than the least significant difference.
*Conclusions:* The indicators were statistically significant; the internal consistency was similar between the pairs and the intraclass correlation coefficient was more satisfactory in the pair that used the definitions. Thus, the construction of empirical referents and the clinical validation process makes the nursing indicators and outcomes more adequate for specific populations and provides an effective means to better evaluate the nursing actions.
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## 1. Introduction

People with stroke commonly have physical alterations that compromise balance and gait, and increase the risk for falls. Regarding risk, which is a potential problem, stimulating adherence to preventive behaviors that focus on the risks presented by each patient is essential, with the development of safety measures that can prevent the occurrence or recurrence of falls (Baixinho & Dixe, 2014).

The occurrence of falls in this population is greater in the home environment. Falls from a standing height represent important clinical situations that may lead to injury, need for hospitalization, and a major financial burden. Nurses are essential professionals in this context because they can minimize complications arising from falls by identifying risks early, planning and implementing preventive strategies (Costa, Oliveira, Moreira, Cavalcante, & Araujo, 2010). In this context, the nursing outcomes enable the professionals to quantify the changes in the patient's health status uniformly before and after interventions, therefore following his/her progress. It is possible to measure specific states from the use of indicators, defined as measures to evaluate the outcomes of interventions. Thereby, the evaluation of nursing outcomes involves deciding the best outcome indicator to be used, the manner and the time after which it will be measured (Moorhead, Johnson, Mass, & Swanson, 2013).

Of the nursing classifications most widely used and studied, the Nursing Outcomes Classification (NOC) presents outcomes to be evaluated by nurses, including *Fall Prevention Behavior*, which compiles indicators that focus on fall prevention and can be evaluated from the dimensions of the patient and the caregiver. This outcome is defined as personal or family caregiver actions to minimize risk factors that might precipitate falls in the personal environment (Moorhead et al., 2013).

The continuous assessment of personal behaviors towards prevention of falls leads to the possibility of early nursing intervention in order to avoid the event and its complications (Costa, 2014).

This research is part of the PhD dissertation entitled Nursing Outcome Fall Prevention Behavior — validation of indicators. There is no conflict of interest involved.

* Corresponding author at: #104/8635 Hudson Street, V6P 4M6 Vancouver, BC, Canada.
*E-mail addresses:* alicegsc@gmail.com (A.G. de Sousa Costa), thelmaaraujo2003@yahoo.com.br (T.L. de Araujo), tahissafc@yahoo.com.br (T.F. Cavalcante), marcos@ufc.br (M.V. Oliveira Lopes), ana.railka@gmail.com (A.R.S. Oliveira-Kumakura), bertilia_chaves@hotmail.com (F.B. Chaves Costa).

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Furthermore, NOC outcomes require continuous validations in specific social, population and regional contexts. As the outcomes and their indicators are identified and refined, we intend to expand the understanding and applicability of the classification (Moorhead et al., 2013).

Validation studies can group different steps, among which the content validation and clinical validation stages are emphasized. The first stage aims to establish the suitability of the indicators for the concept of the phenomenon, through expert review on the issue, indicating its relevance to the outcome. Clinical validation aims to confirm whether the components of outcomes, such as titles, definitions and magnitudes, developed and validated by experts, are supported by actual clinical data from a specific population, and to apply tests that demonstrate statistical associations and configure the level of empirical validity of the instrument (Oliveira, Costa, Lima, Damasceno, & Araujo, 2013).

Thus, the aim of the study was to review and clinically validate the nursing outcome, *Fall Prevention Behavior,* and its indicators, in people with stroke in the home context.

## 2. Materials and methods

This is a Methodological study, performed in the outpatient clinic of two referral hospitals that offer multidisciplinary care aimed at patients with previous hospital admissions in those hospitals due to stroke. The study was approved by the Ethics Committee on Institutional Research under protocol numbers 49.912 and 392.531. Patients and caregivers were informed about the research objectives and provided authorization for participation by signing the consent form.

The population was composed of patients who met the following inclusion criteria: receiving care in one of the *locus* hospitals of research; having a stroke episode, confirmed by medical diagnosis; being older than 18; having cognitive and speech articulation capability to respond to the instrument or who were accompanied by a caregiver 18 years or older, knowledgeable of the patient's home reality, who could provide the necessary information; patients who did not have enough physical mobility to stand and walk from one room in the house to another, either with the aid of equipment or a person. This criterion was adopted because the validation of several indicators depended on a minimum capacity of physical mobility to verify that preventive behaviors were performed by adherence to behavior itself, and not by physical limitation.

Participant selection was based on the amount of indicators in the version of the instrument for the clinical validation step, i.e., 21 indicators, using a minimum of five patients per indicator according to recommendations by psychometricians (Guilford, 1954; Pasquali, 1999). For data collection, the number of five patients per indicator was estimated, with a final amount of 106 patients. These patients were approached when they came to their clinic appointments.

Two forms were used, each applied by a different pair of evaluators. The first form was prepared after content validation phase (Costa, 2014), a step in which indicators titles were slightly modified on order to be as clear as possible for the examiner. Also, the definitions were constructed for each indicator (constitutive definition) and definitions of how to measure them (definition and operational magnitude), subject to validation by experts on the subject, who agreed with keeping the definitions or suggested changes. A binomial test was then calculated to support the changes. The second form contained only the title of the indicators and the Likert scale for the assessment, the way it is presented by NOC. This scale ranges from 1 to 5, which corresponds to the following magnitudes: never demonstrated, rarely demonstrated, sometimes demonstrated, frequently demonstrated, and consistently demonstrated.

Prior to data collection, the instruments were submitted to a pilot test with four patients with stroke, because it is essential for instrument calibration. The test was performed by two pairs of evaluators, including nurses and physical therapists, who previously underwent training. During the pilot test, we noticed the need to improve understanding about the situations in which the option “Not applicable” would be used, which was restricted to the following situations: lack of equipment at home (in the case of security bars, rails, auxiliary mechanisms to walk, among others), and also in the absence of the phenomenon, such as restlessness or changes in vision, in their respective indicators.

Data were collected with the aid of a Samsung® tablet, using the Zwoor application, which provides the free construction and application of downloadable research tools for mobile devices compatible with the Android operating system. The collection was performed offline and was downloaded to the Excel 2010 software at the end of data collection.

In order to find the difference between the evaluators in the medians of the NOC scale, the Friedman test was used, proceeding to the post-hoc analysis through the method of least significant difference (LSD) when a statistically significant difference was found. This method estimates a minimum value between the differences of positions in the pairwise comparison between two evaluators, i.e., when the value of the differences between the means of positions of two evaluators is larger than the calculated LSD, there is considered to be a statistically significant difference between the evaluations.

In order to check the internal consistency of the evaluations by the pairs, we used the value of Cronbach's alpha coefficient. The intraclass correlation coefficient (ICC) was calculated to compare the correlation between the evaluations by the pairs of evaluators and to check the intra-group stability of the instrument, i.e., between the evaluators that used the same evaluation strategy.

## 3. Results

The information was provided by the primary source (patient) (43.4%), by patients and caregivers (32.1%), or only by caregivers (24.5%). The patients were mostly male (51.9%), married (50.9%), widowed (23.6%) or divorced (12.3%). Only four participants had some sort of paid work, the other received around a minimum wage and had low per capita income, which suggests that financial resources were shared with other family members who lived with them. Other variables characterizing the sample are shown in Table 1.

The patients were mostly elderly with low education. The mean time of the last occurrence of stroke was 1.4 years (±1.24 years) while the mean incidence of stroke episodes of 1.64 (±1.31). Most participants (80.2%) were accompanied by family caregivers with a mean time providing care of 2 years (±2.2 years); 49.1% of the patients received some assistance to walk, especially the cane (12.3%) and the assistance of another person (18.9%) Regarding statistical significances of the use or not of operational definitions, Table 2 presents the results of some tests that were applied.

The non-parametric analysis of variance (Friedman's test) showed that twelve indicators showed differences between the inferences made by the pairs of evaluators for each patient. Five showed differences in the means of positions larger than the LSD when comparing evaluators who used the instrument with definitions with those who

**Table 1**
Sample characteristic variables of age, education, number and time of occurrence of stroke(s).

| Variable | Mean | Standard deviation | Median | IR[a] | *p* value[b] |
|---|---|---|---|---|---|
| Age (years) | 66.25 | 14.63 | 68 | 19 | 0.025 |
| Education (years) | 4.18 | 4.19 | 3 | 4 | <0.001 |
| Number of strokes | 1.64 | 1.31 | 1.00 | 1 | <0.001 |
| Time since last stroke (years) | 1.40 | 1.24 | 1.00 | 1.34 | <0.001 |

[a] Interquartile range.
[b] Kolmogorov-Smirnov test.

**Table 2**
Comparison between the classifications (mean of the positions) of the evaluators that used or did not use operational definitions of the scale indicators in patients with stroke.

| Indicator | With definitions‡ | | Without definitions ‡ | | *p* value† | LSD†† |
|---|---|---|---|---|---|---|
| | Evaluator | | Evaluator | | | |
| | 1 | 2 | 1 | 2 | | |
| 1. Uses assistive devices to walk | 2.30 | 2.61 | 2.44 | 2.65 | 0.302 | * |
| 2. Asks for assistance for mobility | 2.35 | 2.58 | 2.55 | 2.51 | 0.693 | * |
| 3. Uses handrails as needed | 1.79$^{A}$ | 1.86$^{A}$ | 3.25$^{B}$ | 3.11$^{B}$ | <0.001 | 1.28 |
| 4. Eliminates clutter, spills, glare from floors | 2.43$^{A,B}$ | 2.45$^{A,B}$ | 2.22$^{A}$ | 2.90$^{B}$ | <0.001 | 0.47 |
| 5. Uses stools and ladders safely | 2.63 | 2.54 | 2.32 | 2.50 | 0.418 | * |
| 6. Uses chairs safely | 2.64$^{A}$ | 2.57$^{A}$ | 2.57$^{A}$ | 2.22$^{A}$ | 0.014 | 0.48 |
| 7. Uses bed or hammock safely | 3.31$^{A}$ | 2.64$^{B}$ | 2.17$^{C}$ | 1.89$^{C}$ | <0.001 | 0.46 |
| 8. Places barriers to prevent falls from bed | 1.96$^{A}$ | 2.13$^{A}$ | 2.88$^{A}$ | 3.04$^{A}$ | 0.008 | 1.39 |
| 9. Adjusts toilet height as needed | 3.45$^{A}$ | 3.20$^{A}$ | 1.30$^{B}$ | 2.06$^{C}$ | <0.001 | 0.57 |
| 10. Uses grab bars in the bathroom | 1.60$^{A}$ | 1.80$^{A}$ | 3.30$^{A}$ | 3.30$^{A}$ | 0.011 | 2.15 |
| 11. Uses rubber mats in tub/shower | 2.88 | 2.88 | 2.13 | 2.13 | 0.080 | * |
| 12. Uses adequate lighting | 2.43$^{A,B}$ | 2.80$^{A}$ | 2.14$^{B}$ | 2.64$^{A}$ | <0.001 | 0.47 |
| 13. Controls restlessness | 2.29$^{A}$ | 2.65$^{A}$ | 2.83$^{A}$ | 2.22$^{A}$ | 0.040 | 0.77 |
| 14. Uses precaution when taking medication that increase risk for falls | 2.43 | 2.48 | 2.48 | 2.61 | 0.751 | * |
| 15. Uses vision-correcting devices | 2.00 | 1.99 | 3.08 | 2.93 | <0.001 | 0.61 |
| 16. Uses auditory-correcting devices | ** | ** | ** | ** | ** | * |
| 17. Uses safe transfer procedure | 2.60 | 2.46 | 2.48 | 2.46 | 0.772 | * |
| 18. Manages urinary/intestinal urgency | 2.50 | 2.82 | 2.23 | 2.45 | 0.106 | * |
| 19. Uses alarm systems | ** | ** | ** | ** | ** | * |
| 20. Uses well-fitting clothes | 2.73$^{A}$ | 2.73$^{A}$ | 2.53$^{A}$ | 2.00$^{B}$ | <0.001 | 0.47 |
| 21. Uses well-fitting tied shoes | 2.66$^{A}$ | 2.63$^{A}$ | 2.28$^{A}$ | 2.42$^{A}$ | 0.003 | 0.47 |

‡Different letters for evaluators correspond to different medians †Friedman's test; ††Least Significant Difference; *The LSD was not able to identify differences; **Statistical calculation impossible due to the low number of evaluations.

did not use it. These indicators were: *Uses handrails as needed*; *Uses bed or hammock safely*; *Adjusts toilet height as needed*; *Uses adequate lighting*; and *Uses well-fitting clothes*. The other seven indicators showed differences between the pair of evaluators who did not use operational definitions, except for the indicator, *Uses bed or hammock safely*, which showed a difference only between evaluators who used operational definitions. The indicators, *Uses auditory-correcting devices* and *Uses alarm systems*, were not evaluated by applying statistical tests because they had "Not applicable" as predominant responses. Table 3 shows statistical data related to consistency and reliability of the instruments.

All indicators were statistically significant ($p < 0.001$). Indicator ten, however, although statistically significant, had a confidence interval ranging from negative to positive values, showing inconsistency between the evaluators. This incongruence also occurred between the pair who used the instrument without the definitions, because there were four negative values in the confidence interval for four of the indicators. For two indicators, the ICC, confidence interval or F test could not be calculated, due to the predominance of "Not applicable" responses.

For the pair which used an instrument with the definitions, low values of the intraclass correlation coefficient (<0.4) were identified in only two indicators: *Adjusts toilet height as needed* and *Uses bed or*

**Table 3**
Presentation of the intraclass correlation coefficient, confidence interval and *p* value assigned to each indicator of the scale.

| Indicator | n | CI[a] | CI[b] | *p* value[c] | n | ICC[a] | CI[b] | *p* value[c] |
|---|---|---|---|---|---|---|---|---|
| | Evaluators with instrument with definitions | | | | Evaluators with instrument without definitions | | | |
| 1. Uses assistive devices to walk | 45 | 0.854 | 0.747–0.917 | <0.001 | 57 | 0.883 | 0.801–0.931 | <0.001 |
| 2. Asks for assistance for mobility | 48 | 0.858 | 0.759–0.918 | <0.001 | 102 | 0.825 | 0.752–0.878 | <0.001 |
| 3. Uses handrails as needed | 14 | 0.657 | 0.220–0.875 | 0.004 | 89 | 0.805 | 0.713–0.869 | <0.001 |
| 4. Eliminates clutter, spills, glare from floors | 105 | 0.766 | 0.673–0.835 | <0.001 | 106 | 0.287 | 0.082–0.463 | <0.001 |
| 5. Uses stools and ladders safely | 60 | 0.788 | 0.670–0.868 | <0.001 | 96 | 0.521 | 0.358–0.653 | <0.001 |
| 6. Uses chairs safely | 99 | 0.621 | 0.484–0.729 | <0.001 | 105 | 0.378 | 0.200–0.531 | <0.001 |
| 7. Uses bed or hammock safely | 106 | 0.332 | 0.118–0.509 | <0.001 | 106 | 0.347 | 0.169–0.504 | <0.001 |
| 8. Places barriers to prevent falls from bed | 43 | 0.734 | 0.543–0.850 | <0.001 | 25 | 0.864 | 0.716–0.938 | <0.001 |
| 9. Adjusts toilet height as needed | 80 | 0.236 | 0.028–0.427 | 0.013 | 90 | 0.085 | -0.064–0.257 | 0.018 |
| 10. Uses grab bars in the bathroom | 8 | 0.591 | -0.047 - 0.899 | 0.041 | 22 | 0.899 | 0.772–0.957 | <0.001 |
| 11. Uses rubber mats in tub/shower | 10 | 0.800 | 0.408–0.945 | 0.002 | 24 | 0.703 | 0.432–0.859 | <0.001 |
| 12. Provides adequate lighting | 103 | 0.560 | 0.400–0.684 | <0.001 | 106 | 0.588 | 0.412–0.715 | <0.001 |
| 13. Controls restlessness | 41 | 0.739 | 0.543–0.855 | <0.001 | 100 | 0.065 | -0.134 – 0.258 | 0.261 |
| 14. Uses precaution when taking medication that increase risk for falls | 87 | 0.845 | 0.772–0.896 | <0.001 | 100 | 0.653 | 0.525–0.752 | <0.001 |
| 15. Uses vision-correcting devices | 76 | 0.867 | 0.798–0.914 | <0.001 | 71 | 0.938 | 0.902–0.961 | <0.001 |
| 16. Uses auditory-correcting devices | 10 | – | – | – | 6 | – | – | – |
| 17. Uses safe transfer procedure | 104 | 0.772 | 0.682–0.840 | <0.001 | 106 | 0.447 | 0.280–0.587 | <0.001 |
| 18. Manages urinary/intestinal urgency | 40 | 0.469 | 0.194–0.677 | <0.001 | 100 | 0.657 | 0.529–0.755 | <0.001 |
| 19. Uses alarm systems | 1 | – | – | – | 16 | 0.409 | -0.046 – 0.737 | 0.041 |
| 20. Uses well-fitting clothes | 105 | 0.445 | 0.278–0.587 | <0.001 | 106 | 0.033 | -0.138 – 0.207 | 0.357 |
| 21. Uses well-fitting tied shoes | 102 | 0.716 | 0.607–0.799 | <0.001 | 105 | 0.809 | 0.731–0.866 | <0.001 |

[a] Intraclass correlation coefficient.
[b] Confidence interval.
[c] F Test.

*hammock safely*. This result may indicate a low reliability for evaluation of these items, which points to a need to modify and clarify the proposed definitions. The second item in particular had already shown differences in the evaluations performed with the use of operational definitions. In the remaining cases, the coefficient was excellent ($\geq 0.75$) or satisfactory ($0.4 \leq ICC < 0.75$).

For the pair of evaluators without the definitions, the inconsistencies were greater, as only seven indicators presented excellent ICC, whereas the others had moderate or low reliability.

The internal consistency of the scale occurred when it was used by a trained evaluator and the Cronbach α value was 0.751. This value denotes a satisfactory internal consistency for the application of the scale by a trained professional.

## 4. Discussion

In the choice of clients for this clinical validation, the assumption that the choice of large samples is beneficial for this step was addressed, and the study included individuals of different ages, making it possible to increase the power of generalization of findings (Silva et al., 2011). Conducting a pre-test to evaluate the feasibility, efficiency and cost of survey methodologies, reproducibility and accuracy of measurements was also an alternative used by other authors to improve calibration of the instrument and the methodological process (Oliveira et al., 2013).

The profile of patients with stroke included in this study was similar to other research that included mostly elderly men, with a partner, retired, with low income and education, with a family member as a primary caregiver (Costa et al., 2010). A fact that showed divergence when compared to some studies was related to gender, as other authors have found females most prevalent in the occurrence of stroke (Oliveira et al., 2013; Antes, D'Orsi, & Benedetti, 2009).

The mean time of caregiver activity reported was higher than the last occurrence of stroke and this can be explained by the fact that most were elderly, therefore they may have experience age-related physiological changes, and in many cases, this was not the first stroke (Fonseca & Penna, 2008).

Regarding the outcome indicators, the importance of fall prevention behavior in the daily life of people who experienced an episode of stroke should be noted. Confirming not only adherence to prevention strategies, but the way they occur from correct and validated professional orientations, denotes their essential nature to the goals of preventing falls.

It should be noted that individuals with a stroke, after the acute phase of hospitalization, often start to experience a sudden change in their daily activities at home. In this sense, the performance of the healthcare team, especially nurses, is essential. When performing home visits, this professional should pay attention to these issues, in order to suggest the changes necessary to maintain the safety and health of the individual in his/her home. However, the changes must be made with the patient's consent, given the emotional significance of the objects in his/her house, and the ineffectiveness of interventions made without patients' permission (Celich, Souza, Zenevicz, & Orso, 2010).

Regarding the indicator, *Uses assistive devices to walk*, it is noteworthy that, when used incorrectly, equipment such as canes and walkers will represent a risk rather than a preventive intervention. Falls associated with mechanisms to assist with walking are probably an underreported public health issue, as they reach high rates in the elderly, especially in women and those who used walkers. Other authors have shown that 60% of injuries occur at home, leading to consequences such as fractures and contusions (Stevens, Thomas, Leesia, & Greenspan, 2009). The indicators of *Fall Prevention Behavior* involving equipment, in many cases, may not be accessible to some people because of the financial cost, hindering access to those who earn little and still have to share resources with other family members. Therefore, many patients improvised their support mechanisms, using broomsticks as canes, among other artifacts, without any professional guidance, often presenting intuitive preventive behaviors.

Other indicators of the studied outcome also imply the acquisition and even installation of equipment, with environmental changes aimed at preventing falls. Thereby, the economic question still overlaps other preventive actions, such as installing rails in the bathroom, adapting the toilet height, acquisition of resources for vision or hearing correction, use of alarms and appropriate footwear to prevent falls, among others.

In this context, the importance of a support network for patients should be mentioned, as it can directly influence a person's decision-making with regard to a preventive behavior (Erikson, Park, & Tham, 2010; Häggström & Lund, 2008). Thus, collaborative efforts are stimulated, considering financial resources, because the changes in routine habits imply a burden (King, Hartke, & Houle, 2010; Salter, Helings, Foley, & Teasell, 2008).

In addition to the financial factor, it was noted that when the adjustments were mentioned, they were neither performed without professional guidance nor in compliance with the recognized parameters, which may imply the continuity of the risks to patients. In this context, preventive actions in order to educate, guide and empower the individual and the family, making them protagonists of the actions related to their health, deserve special attention of the professionals involved in the care (Costa et al., 2010).

Another point was raised about the suitability of some of the indicators to the nursing outcome, as they are indicators that must be present in the environment and therefore require purchase and installation. Among the nursing outcomes linked to the nursing diagnosis, *Risk for falls*, the main diagnosis related to the problem of falls, one outcome stands out, which is directed to environmental changes: *Safe home environment* (Johnson et al., 2012). The indicators of this outcome include items such as items such as placement of handrails, availability of emergency response system, and accessibility of assistive devices, among others concerning fall prevention. Another outcome related to falls that precedes decision making as to the preventive behavior is, *Knowledge: fall prevention*, which was developed to describe the individual understanding in the application of information to promote, maintain and restore health (Moorhead et al., 2013).

With respect to the cultural factor, the use of regional issues such as network usage was perceived as beneficial to the study when considering the predominant place to sleep, because when the application of the instruments was performed in the clinical validation, hammock usage was as common as the bed. In addition, the major use of "flip-flops" was noted in the home environment. Using this type of slipper presents a risk for falls, because they are not closed, their material is not firm to support walking, and they have no binding mechanisms.

Cultural issues can be perceived not only in definitions and items, but they can also be extended to an entire outcome that is specific to the reality of that location. As an example, we can mention two new outcomes presented in the fifth NOC edition, which are: *Cup feeding establishment: infant* and *Cup feeding performance* (Moorhead et al., 2013). These outcomes were included by nurses from African countries, where the reality of child nutrition occurs predominantly by using a cup instead of breastfeeding, due to the HIV epidemic faced in many regions, among other reasons (Sadoh, Sadoh, Adeniran, & Abhulimhen-Iyoha, 2008).

Finally, we highlight the greater consistency found between the assessment of professionals who used the instrument containing the definitions and magnitudes for each indicator. In this context, the evaluation took place more evenly, which indicates a greater efficiency in the evaluation of patients, by providing scientifically based and validated indicators able to measure the actual results and support the nursing plan of care. Some indicators, however, that showed significant statistical differences, also received suggestions for modification or exclusion. As the study was applied in a specific population, it was decided to confirm the real need for exclusion in future studies with larger populations, when the data can be generalized.

## 5. Limitations

The choice of a specific population may have limited the findings and hinders the generalizability. Moreover, the restriction of the study to a single region brings a unique cultural context. Culture, in turn, directly influences the adherence to a behavior, and this may have contributed to the impossibility of validating some indicators and also prevented the exclusion of indicators, as these may not suit the population studied, but may be ideal to measure the actions proposed in another group with different characteristics.

## 6. Conclusions

The results confirmed the efficiency of the construction process of empirical referents and adequacy for a specific population, in order to guide the actions of the nurse and standardize the concepts and terms used. Also, the use of definitions makes the measure of a nursing outcome more clear and uniform by the nurses.

Also, it should be noted that many indicators imply not only changing habits but also the acquisition of equipment and implementation of environmental adaptations that represent a financial burden. Therefore, future studies investigating these indicators are needed and important to confirm their importance and maintenance in the classification.

For the indicators that could not be validated, due to a low frequency in the findings, conducting further investigations in different populations is recommended, which will demonstrate their importance in different contexts. The conduct of studies using home visits is also recommended, so that there is a comparison of patient information and data that reflect the actual living situation, in relation to the existing fall prevention behaviors.

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