Original Article

PHYSICAL MOBILITY OF STROKE PATIENTS IN THE HOME: A PROPOSED CONCEPT

LIMITAÇÃO DA MOBILIDADE FÍSICA EM PACIENTES APÓS O ACIDENTE VASCULAR ENCEFÁLICO NO DOMICÍLIO: PROPOSTA DE UM CONCEITO

LIMITACIÓN DE LA MOVILIDAD FÍSICA EN PACIENTES DESPUÉS DEL ACCIDENTE CEREBROVASCULAR EN EL HOGAR: PROPUESTA DE UN CONCEPTO

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The aim of the present study was to construct a concept of mobility limitation in the home, based on the identification of antecedents, attributes, and consequences in stroke patients. It accomplished the concept analysis of the literature starting from access on-line to three databases, in October month 2009. It used descriptors Mobility Limitation and Stroke in the English, Portuguese and Spanish languages. It was found 140 articles and selected 13. The main antecedents identified were: stroke, decreased muscle strength in the lower limbs, and loss of balance; attributes: impaired walking ability and decreased walking speed; consequences: decreased quality of life, decreased participation in society, decrease in activities of daily living and instrumental activities of daily living, and falls. This search might support the future creation of tools for use in studies on this subject and will enable nurses to better focus their practice for the care of these patients.
Descriptors: Mobility Limitation; Stroke; Nursing; Review.

O objetivo do estudo foi construir o conceito de limitação da mobilidade, a partir da identificação de antecedentes, atributos e consequentes em pacientes após o acidente vascular encefálico no domicílio. Realizou-se uma análise de conceito a partir de acesso on-line a três bases de dados em outubro de 2009. Utilizou-se os descritores Limitação da mobilidade e Acidente Cerebral Vascular nas línguas inglesa, portuguesa e espanhola. Foram encontrados 140 artigos e selecionados 13. Principais antecedentes: acidente vascular encefálico, diminuição da força muscular nos membros inferiores e diminuição do equilíbrio; atributos: habilidade para caminhar comprometida e diminuição da velocidade da marcha; consequentes: diminuição da qualidade de vida, diminuição da participação na sociedade, diminuição das atividades de vida diária e instrumentais da vida diária e queda. Esta pesquisa pode apoiar a futura criação de outros estudos sobre o assunto e permitir que os enfermeiros melhorem a sua prática de atendimento desses pacientes.
Descritores: Limitação da Mobilidade; Acidente Cerebral Vascular; Enfermagem; Revisão.

El objetivo fue construir el concepto de limitación de la movilidad en el hogar, basado en la identificación de antecedentes, atributos y consecuencias en pacientes después del accidente cerebrovascular. Se realizó análisis de conceptos a través del acceso on-line a tres bases de datos en octubre de 2009. Se utilizó los descriptores Limitación de la Movilidad y Accidente cerebrovascular, en inglés, portugués y español. Fueron encontrados 140 artículos y seleccionados 13. Antecedentes principales: derrame cerebral, disminución de la fuerza muscular en extremidades inferiores y pérdida del equilibrio; atributos: capacidad de caminar perjudicada y disminución de la velocidad al caminar; consecuencias: disminución de la calidad de vida, reducción de la participación en sociedad, disminución de las actividades de vida diaria y actividades instrumentales de vida diaria y caídas. Esta investigación puede apoyar la creación de estudios sobre este tema y permitir que enfermeros mejoren sus prácticas de atención a estos pacientes.
Descriptores: Limitación de la Movilidad; Accidente Cerebrovascular; Enfermería; Revisión.

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INTRODUCTION

The growth of the older person population is increasing worldwide. This phenomenon is associated with changes that are inherent to the aging process, such as polypathologies, particularly cerebrovascular accident and stroke. Stroke is the primary cause of incapacity and the third most common cause of death in the United States, with nearly 600 thousand cases and 160 thousand deaths each year, second only to heart disease and cancer[1]. Stroke is considered a severe public health problem due to its magnitude, transcendency, and contribution to adult mortality. It is also one of several diseases that generally affect a patient's mobility[2].

There has been a large increase in the number of nursing studies on the rehabilitation of stroke patients, focusing on interventions that contribute to the rehabilitation of these patients[3]. This increase might be associated with the numerous consequences arising from stroke, such as alterations in mobility. There is no doubt that mobility - an individual's ability to move around - is a very important part of physical function, and a pre-requisite for performing activities of daily living and maintaining independence. Impaired mobility can lead to dependence and incapacity[4].

To facilitate the recovery of mobility, once the patient has emerged from the acute stage of a stroke, it is necessary to immediately begin rehabilitation procedures, starting when the stroke victim is hemiplegic and requires care, as generally occurs. The aim of rehabilitation should be to prevent deformities, exercise the affected limbs to maintain and develop strength and flexibility, and help the patient to obtain independence in their daily activities[5]. Unfortunately, however, a large proportion of patients do not have access to specialized rehabilitation services and do not receive the necessary guidance from health professionals so that together with their caretakers, they can carry out activities that will promote their rehabilitation, particularly within the home.

A study of 121 stroke patients who attended a rehabilitation service, for which the nursing diagnoses of the class activity/exercise of the Nanda – International (NANDA I)[6] were analyzed, identified impaired physical mobility (90.1%) as one of the most common diagnoses[7]. The results emphasized that even after the start of rehabilitation, the majority of patients have limited mobility and difficulty carrying out activities of daily living at home.

Thus, in view of the high number of people affected by stroke, and consequently suffering incapacity, the following question emerged: What is the definition of mobility limitation of stroke patients at home? A more complete understanding of this topic will provide a basis for the planning and implementation of nursing interventions that are more focused on the actual needs of these patients.

A concept is an idea or mental construct elaborated around a phenomenon, and is essential for performing research. Concepts include abstract attributes in relation to the reality[8].

To study a concept, a Concept Analysis Model must be used. Of the existing models, the one highlighted here, comprises eight stages: selecting the concept; determining the objectives and proposals for the conceptual analysis; identifying the possible uses of the concept; determining critical attributes; identifying a model case; identifying related, contrary, invented, and illegitimate cases; identifying antecedents and consequences of the concept, and defining empirical references[9].

Concept analysis is a careful examination of the description of a word or expression. It clarifies the terms used in communication, thereby increasing the richness of the vocabulary. Concept analysis is a method that has furthered the development of science in many

disciplines. The analysis of concepts is never considered a finished product[9].

Therefore, a study of the comprehension of attributes relating to the concept of mobility limitation in stroke patients at home will facilitate the development of tools, and contribute to helping nurses improve the quality of life of these patients, taking into consideration their mobility limitations, particularly with regard to rehabilitation and reintegration into society. The role of the nurse in each phase, including rehabilitation, is a decisive factor for success.

Thus, the main objective of this study was to construct a concept of mobility limitation, based on the identification of its antecedents, attributes, and consequences among stroke patients at home.

METHOD

To analyze the concept of mobility limitation among stroke patients in the home, we chose five stages of the Concept Analysis Model[9]. The stages were: selecting the concept; determining the objectives and proposals for the conceptual analysis; identifying possible uses of the concept; determining the critical attributes, and identifying the antecedents and consequences of the concept.

The concept should be selected with great care. Ideally, it should be a theme that interests the researchers, and that reflects the area of greatest research interest[9]. Identifying the nursing diagnosis that impaired physical mobility is a common consequence in stroke victims[7], evoked our interest in understanding the concept of mobility limitation in this specific population.

To identify the use of the concept, in the third stage, it is important to consider the full use of the term, not restricting the literature search to the nursing or medical literature, but broadening the search to include other disciplines[9]. We therefore searched the concept of mobility limitation in stroke patients in the home,

without restricting our search to any specific professional area or to the year in which the study was published.

To assist in the literature search, an integrative review comprising the following stages was performed: identification of the question and objective of the research, literature search, evaluation of the data, analysis of the data, and presentation[10]. Some of these stages are similar to those of Concept Analysis[9]. The integrative review summarizes the results of relevant studies, recognized worldwide, and facilitates the incorporation of evidence, i.e., it speeds up the transfer of new knowledge to practical application[10]. As the basis of the integrative review, the following question was formulated: What is the definition of mobility limitation in stroke patients at home?

The articles were selected by means of online access to the following databases: Pubmed (National Library of Medicine and National Institutes of Health), Cinahl (Cumulative Index to Nursing and Allied Health Literature), and Scopus.

The articles were searched in October 2009, and the controlled key words of the Biblioteca Virtual em Saúde and MeSH (Medical Subject Headings) were used in Portuguese (*Limitação da Mobilidade* and *Acidente Cerebral Vascular*), English (Mobility Limitation and Stroke), and Spanish (*Limitación de la movilidad* and *Accidente Cerebrovascular*). In the Scopus database, non-controlled key words were used.

The criteria established for inclusion of the references were: Articles available in electronic format; articles available in Portuguese, English, or Spanish; and articles that addressed mobility limitation in stroke patients aged over 18 years of age, in the home, who responded to the basic questionnaire of each study.

Articles not initially available in the databases during the data collection period were searched for in the periodicals portal of the Coordenação de Aperfeiçoamento de Pessoal de Nível Superior (Coordination for the Improvement of Personnel in

Higher Education) - CAPES. After selection, the articles were read, in accordance with the stages of the Concept Analysis Model, to determine the antecedents, critical attributes, and consequences of the concept.

Antecedents are events or incidents that should appear prior to the emergence of the concept. The attribute is the idea that is most closely associated with the concept. Attributes are the words or expressions used by the authors to describe the characteristics of the concept. They therefore give the analyst a broader view of the concept. Attributes can modify or improve the understanding of the concept. This understanding may

change over time, or when used in a different concept from the one studied. Consequences are the facts resulting from the emergence of the concept[9]. Based on the identification of antecedents, attributes, and consequences; it was possible to construct a proposed definition for the concept of mobility limitation.

The results of the study are presented in the form of a table and a figure, and as mentioned earlier, analyzed according to a Concept Analysis Model[9]. As this study did not involve research on human beings, no approval by the Research Ethics Committee was necessary.
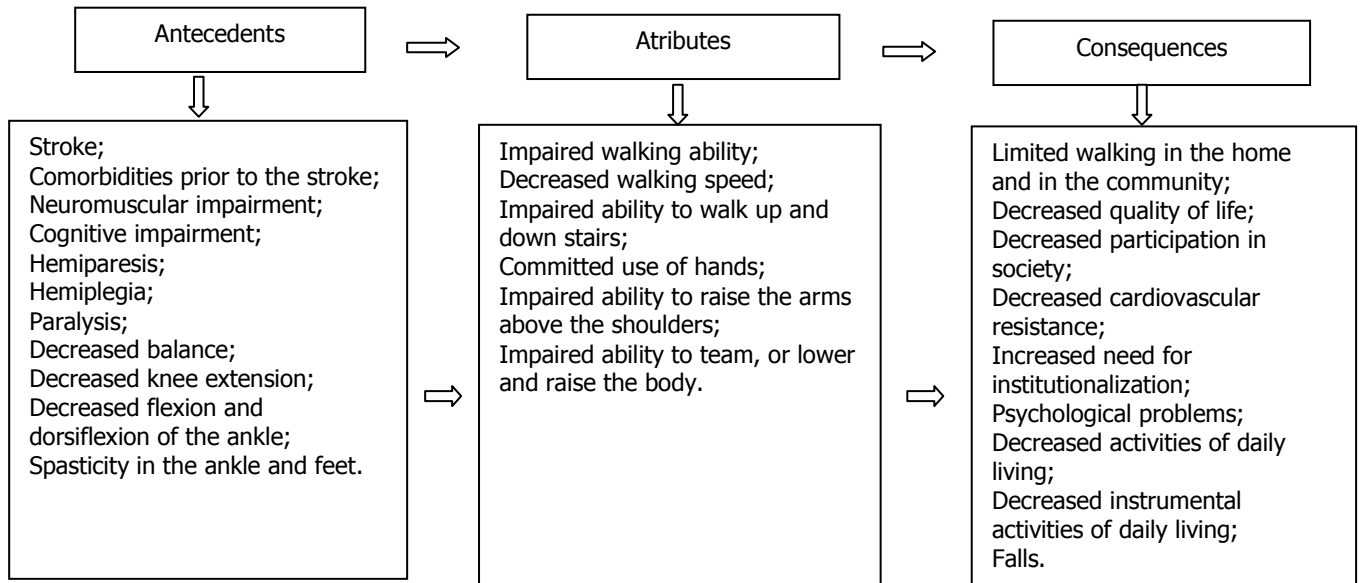
RESULTS

When searching the Scopus, Pubmed, and Cinahl databases, only the titles and abstracts were initially read, and where necessary, the full texts were skimmed. Through this process, only 13 articles were

identified for analysis, because the 11 articles selected from the Pubmed database were also found in the Scopus database (Table 1). The 13 selected articles were then read in depth to identify the antecedents, critical attributes, and consequences (Figure 1).

Table 1 - Selection of articles in the Scopus, Pubmed, and Cinahl databases. Fortaleza, 2009

Articles/Database	Scopus	Pubmed	Cinahl
Found	63	48	29
Excluded			
Theme not included	45	24	29
Not available in electronic format	5	13	-
Selected	13	11	0

Antecedents	⇒	Atributes	⇒	Consequences

| Stroke;
Comorbidities prior to the stroke;
Neuromuscular impairment;
Cognitive impairment;
Hemiparesis;
Hemiplegia;
Paralysis;
Decreased balance;
Decreased knee extension;
Decreased flexion and dorsiflexion of the ankle;
Spasticity in the ankle and feet. | ⇒ | Impaired walking ability;
Decreased walking speed;
Impaired ability to walk up and down stairs;
Committed use of hands;
Impaired ability to raise the arms above the shoulders;
Impaired ability to team, or lower and raise the body. | ⇒ | Limited walking in the home and in the community;
Decreased quality of life;
Decreased participation in society;
Decreased cardiovascular resistance;
Increased need for institutionalization;
Psychological problems;
Decreased activities of daily living;
Decreased instrumental activities of daily living;
Falls. |

Figure 1 - Presentation of antecedents, attributes and consequences of physical mobility limitation

DISCUSSION

In this study, the antecedents were identified through the responses to the following question: what events contribute to the imminence of the concept of mobility limitation in stroke patients?

Stroke was an antecedent that was identified in all the articles as a precedent for mobility limitation. This was explained by the fact that the population analyzed specifically comprised individuals with the disease.

Stroke is the primary cause of impairments and disabilities in adults, leading to mobility limitation and impaired walking ability. This mobility limitation depends not only on the severity of the disease, but also on the presence of pre-existing comorbidities[11]. Patients with neuromuscular impairment resulting from stroke may have difficulty walking[12].

A stroke survivor may also have cognitive impairment, which is often related to disabilities such as mobility limitation[13]. Another study confirmed that cognitive impairment is an independent factor associated with mobility limitation[14].

Decreased muscle strength in the lower limbs is a predictor for mobility limitation. Muscle strength involving the lower limbs in stroke survivors is closely associated with habitual walking speed and walking ability[13,15]. Another study identified that decreased muscle strength in the lower limbs following stroke is caused by decreased strength of the feet and ankles, thereby limiting mobility[16].

Paralyses, hemiplegias, and hemiparesis are very common among stroke survivors, and may be responsible for affecting the patient's balance and muscle strength[17-18]. Balance is also a strong predictor of walking ability[12].

Decreased knee extension and decreased dorsiflexion of the ankle can lead to mobility limitation[13]. Exercises to improve dorsiflexion of the ankle and spasticity of the ankle and feet in the initial phase of the disability can decrease this limitation over time[15].

To identify the attributes of mobility limitation that emerge in stroke patients, the following questions were used: How does the author define the concept? What are the characteristics/attributes indicated by the author? What ideas does the author raise in relation to mobility limitation in stroke patients?

One of the attributes identified in the analysis of the 13 articles was impaired walking ability. Walking is a common goal for stroke survivors, as in the majority of these patients, this ability is affected in the months immediately following the stroke. The ability to climb stairs is also impaired[12]. To evaluate mobility limitation, one study considered walking ability, going up and down stairs, leaning, lowering or raising the body, and raising the arms above the shoulders[19].

Another attribute is decreased walking speed, which is a key factor of mobility limitation. This was determined to be the most effective predictor in the classification of walking ability, and was used to measure the recovery of mobility following stroke[20].

A study showed that use of the hands is also impaired in stroke patients; some patients present great difficulty, while others are unable to use the hands at all[16].

In the analysis of 13 articles, no definition was identified for the concept of mobility limitation in stroke patients at home. The identification of attributes is important for promoting a wider understanding of the concept that is common among the population with this disease.

Falling is the most common complication following stroke, resulting from motor, sensorial, functional, cognitive, and emotional impairment[17-18]. This impairment is frequently reported as a decline in activities of daily living and instrumental activities of daily living, decreased social participation, and decreased quality of life[17,20,11].

Decreased muscle strength and impaired balance in stroke patients are predictors of falls[21]. Decreased muscle strength in the lower limbs increases risk of falls[22]. Furthermore, patients with cognitive impairments resulting from stroke may fall as a consequence of the cognitive impairment, which is difficult to prevent in this type of patient[18].

Decreased self-care and mobility as a result of stroke are closely related to a decrease in quality of life and participation in the community[13,23]. Decreased walking speed following stroke limits walking in the home and in the community, and is associated with decreased quality of life[20].

Stroke survivors with impaired use of their hands have difficulty performing instrumental activities of daily living, such as carrying objects, or tying a tie or shoe laces[16]. Also, approximately 26% of stroke survivors are dependent when it comes to activities of daily living[13,23].

There is reduced independent participation in the community and increased institutionalization among elderly stroke patients. Various psychologic consequences also emerge in survivors of this disease. A study on the changes that occur in this population showed that 1 year after the stroke, patients suffer from depression[14], with a high incidence of depression in people who survived the disease over the long-term. Depression is correlated with incapacity and a decreased quality of life[13]. In addition to the psychologic problems, decreased cardiovascular resistance is also prevalent in patients with this pathology[12].

As mentioned earlier, no definition has been identified for mobility limitation in stroke patients at home. In one article, however, mobility was defined as walking in general and the individual's ability to use their arms and legs[19].

Analyzing the antecedents, attributes, and consequences, and based on the definition of mobility identified, the following proposal was constructed for the concept of mobility limitation: impaired motor capacity to use the upper and lower limbs, with the characteristics of impaired ability to lean, lower and raise the body, walk, and go up and down stairs, decreased walking speed, impaired use of the hands, and impaired ability to raise the arms above the shoulders.

The discovery of new concepts is one of the methods used in concept analysis. To analyze the concept fully, it is necessary to examine the suitability of the definition derived from the literature-based analysis for members of various groups, in order to develop and expand the definition derived from the initial analysis[8], therefore this definition cannot be considered as unique or flawless until it has been validated by specialists. A gap exists in knowledge about instrument validation in the health area[24].

The professional should go beyond the analysis of the concept and perform analysis tests, discover new concepts and relations, expand existing concepts through studies of contextual construction, and explore alternative forms of expression and new methodologies for developing the concept[8].

CONCLUSION

The analysis of the concept of mobility limitation in stroke patients at home led to the identification of antecedents, attributes, and consequences, enabling a wider understanding of the phenomenon. Among the antecedents, stroke was identified as the most prevalent, given that this was the population selected for studying mobility limitation. Other antecedents identified with high frequency were: decreased muscle strength in the lower limbs and loss of balance.

In terms of attributes, impaired walking ability and decreased walking speed were the most prevalent. The consequences most frequently identified with these attributes were: decreased quality of life, decreased participation in society, decreased activities of daily living and instrumental activities of daily living, and falls. Based on the above, a definition was proposed for the concept of mobility limitation.

The identification, in this study, of the antecedents, attributes, and consequences most frequently associated with the concept of mobility

limitation in stroke victims at home, might support the future creation of tools for use in studies on this subject.

The concern with mobility limitation in stroke survivors is relatively recent, as all 13 articles identified in the databases were published after 2002. It is also noted that all the articles were included in the Scopus database, which suggests that this database is the most complete. The authors of these articles were mainly from the areas of medicine and occupational therapy. Therefore, further studies on the theme are recommended, including those performed by nurses.

The high prevalence of patients among the worldwide population who have suffered stroke and its effects, including mobility limitation, suggests a need for further nursing studies that will support an evidence-based nursing practice.

Identifying these antecedents, attributes, and consequences of mobility limitation in stroke patients will enable nurses to better focus their practice for the care of these patients, seeking to intervene in the most effective way, particularly in relation to walking, to attempt to prevent falls, in the patients' integration with society, and in their return to activities of daily living, thereby improving their quality of life.

The proposed definition of the concept of mobility limitation was not validated. Therefore it is suggested that further studies be performed in this area. Furthermore, the study was restricted to stroke survivors at home. The study should therefore be widened to include various other populations.

COLLABORATIONS

Moreira RP, Araujo TL and Pagliuca LMF contributed to the design, field data collection, analysis, interpretation

of data, drafting and final approval of the version to be published.

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