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Risk Factors for Falls in Adult Stroke Patients: A Comprehensive Model

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Stroke is a prevalent disease among the adult population in the world (Cho, Yu, & Rhee, 2015; Thrift et al., 2014). For stroke patients, falling is a major concern that accounts for 30% of complications, resulting in fractures, head trauma, even death (Benjamin et al., 2017; Chin, Wang, Ong, Lee, & Kong, 2013; Jalayondeja, Sullivan, & Pichaiyongwongdee, 2014; Ng, Hill, Batchelor, & Burton, 2017). Nonetheless, the current literature lacks a comprehensive model that synthesizes findings from individual studies. As a result, it is difficult to understand the overall risk factors for falls in stroke patients. The purpose of this review was to build a comprehensive model that can explain risk factors for falls in adult stroke patients.

I searched CINAHL, Pubmed, Scopus, and PsycINFO using the keywords, stroke, fall, factor, influence, and characteristics. Inclusion criteria included: published in English between 1980 and 2017 with full-text available. Exclusion criteria included: duplicate articles or citations with abstracts only. Seventeen studies met both inclusion/exclusion criteria.

Using theory synthesis, I constructed an integrated model that involved risk factors of falls in stroke patients. First, I specified the focal concept to be falls among stroke patients. Second, I reviewed 17 studies that investigated risk factors of falls among stroke patients and examined the relationships between each factor and falls. Lastly, I combined the relationships to construct an integrated model that can explain the overall risk factors of falls.

Twenty-one fall risk factors in stroke patients emerged from the 17 studies. For a parsimonious integrative model, I sorted the 21 risk factors into five categories based on attribute similarities. To ensure whether each risk factor was sorted into the appropriate category, I continuously compared with other researchers' work. When more than two researchers classified a risk factor differently than me, I moved that risk factor to their category. After verifying the accuracy of the categories, I labeled each category by its attributes.

Through theory synthesis, I built a comprehensive model that consisted of five categories of fall risk factors in stroke patients. Risk factor categories were patients' general characteristics (included old age and living with household members), physical function (including impaired gait/mobility, lower extremity muscle weakness, hemiplegia, and decreased gross/fine motor skill), neurological function (impaired balance and impaired cognitive function), stroke-specific characteristics (affected left side of the body, longer duration since a stroke, and acute stage of a stroke), and patients' medical history (previous fall experiences, having comorbidity, and use of polymedication).

Using the developed comprehensive model, nurses may develop care plans to prevent falls by focusing on the specific risk factors. For example, if a stroke patient has physical impairment on his/her left side of the body, a nurse can recognize the patient may have high risks of falls based on the comprehensive model. This is because patients who affected left side of the body usually have left neglect and vision problems. Therefore, nurses can encourage patients to practice daily activities in front of the huge mirror to increase awareness of the left side.

Title:
Risk Factors for Falls in Adult Stroke Patients: A Comprehensive Model

Keywords:

Accidental falls, Risk factors and Stroke

References:

Benjamin, E. J., Blaha, M. J., Chiuve, S. E., Cushman, M., Das, S. R., Deo, R., … Muntner, P. (2017). Heart disease and stroke statistics-2017 update: A report from the American Heart Association. *Circulation*, *135*, e146–e603.

Chin, L. F., Wang, J. Y. Y., Ong, C. H., Lee, W. K., & Kong, K. H. (2013). Factors affecting falls in community-dwelling individuals with stroke in Singapore after hospital discharge. *Singapore Medical Journal*, *54*, 569–575.

Cho, K., Yu, J., & Rhee, H. (2015). Risk factors related to falling in stroke patients: A cross-sectional study. *Journal of Physical Therapy Science*, *27*, 1751–1753.

Jalayondeja, C., Sullivan, P. E., & Pichaiyongwongdee, S. (2014). Six-month prospective study of fall risk factors identification in patients post-stroke. *Geriatrics & Gerontology International*, *14*, 778–785.

Ng, M. M.-D., Hill, K. D., Batchelor, F., & Burton, E. (2017). Factors predicting falls and mobility outcomes in patients with stroke returning home after rehabilitation who are at risk of falling. *Archives of Physical Medicine and Rehabilitation*, *98*, 2433-2441.

Thrift, A. G., Cadilhac, D. A., Thayabaranathan, T., Howard, G., Howard, V. J., Rothwell, P. M., & Donnan, G. A. (2014). Global stroke statistics. *International Journal of Stroke, 9*, 6–18.

Abstract Summary:

The comprehensive model which could explain fall risk factors in stroke patients was constructed using theory synthesis. The model consisted of five categories, which were patients' general characteristics, physical function, neurological function, stroke-specific characteristics, and patients' medical history.

Content Outline:

1. Introduction
   A. For stroke patients, falling is a major concern that accounts for 30% of complications.
   B. Falling needs to be prevented because it can cause fractures, head trauma, even death.
   C. However, it is difficult to understand the overall risk factors for falls in stroke patients because the literature currently lacks a comprehensive model which synthesizes findings from individual studies.

2. Purpose
   The purpose of this review was to build a comprehensive model that can explain risk factors for falls in stroke patients.

3. Search strategy
   A. Searched literature in CINAHL, Pubmed, Scopus, and PsycINFO using keywords.
   B. Keywords were stroke, fall, factor, influence, and characteristics.
   C. Inclusion criteria included: published in English between 1980 and 2017 with full-text available.
   D. Exclusion criteria included: duplicate articles or citations with abstracts only.
   E. Seventeen studies were founded.

4. Synthesis of evidence
   A. Used theory synthesis to construct an integrated model.
   B. Followed three steps to use theory synthesis.

a. Specified the focal concept to be falls among stroke patients.
b. Reviewed 17 studies and examined the relationships between each factor and falls.
c. Combined the examined relationships to construct an integrated model.

5. Findings
A. Founded 21 risk factors in stroke patients from 17 studies.
B. The founded risk factors were sorted into five categories for a parsimonious integrative model.

a. The risk factors were sorted into categories based on attribute similarities.
b. To ensure accuracy of sorting, I continuously compared with other researchers' work.
c. If more than two researchers classified a risk factor differently than me, I moved that risk factor to their category.
d. Labeled each category by its attributes.

C. Constructed an integrated model which involved five categories of fall risk factors.

a. First category: Patients' general characteristics
1) Old age and living with household members were included.
2) As people age, they are highly likely to have lower body functions involving physical, cognitive, and sensory abilities. As a result, older stroke patients have a higher chance of falls, compared to younger patients.
3) Stroke patients who live with household members cannot improve functional recovery because they continuously receive helps from family members. For that reason, they are highly likely to fall rather than other patients who live alone.

b. Second category: Physical function
1) Impaired gait/mobility, lower extremity muscle weakness, hemiplegia, and decreased gross/fine motor skill were included.
2) Falling occurs while people move their body to somewhere by walk, gait ability can affect the likelihood of falling.
3) To walk safely without falling, adequate lower extremity muscle strength and fine motor skills are demanded to support body movement and control limbs. Paralysis resulting from hemiplegia also can affect walking ability.

c. Third category: Neurological function
1) Impaired balance and cognitive function were involved.
2) Because stroke damages balance systems including visual, vestibular, and somatosensory systems, stroke patients can easily fall.
3) Decreased cognitive function make stroke patients hard to aware dangerous situations and hard to judge how to avoid danger to prevent falls.

d. Fourth category: Stroke-specific characteristics
1) Affected left side of the body, longer duration since a stroke, and acute stage of a stroke were included.
2) Stroke patients who were affected left side of the body might have high risks of falls due to inattention, impaired perception, and symptom of left neglect.
3) As duration of disease become longer, stroke patients showed increased number of falls due to repeated falls.
4) Stroke patients who correspond to acute phase of stroke may have high risks of falls due to seriously impaired physical and cognitive functions.

e. Fifth category: Patients' medical history
1) Previous fall experiences, having comorbidity, and use of polymedication were included.
2) Stroke patients who experienced previous falls might have fear of falling and hesitate physical activities. As a result, decreased muscle weakness resulting from decreased physical activities can incur repeated falls.

3) Having comorbidity, such as urinary incontinence, heart disease, and depression increased risks of falls in stroke patients.
4) Using polymedications including hypoglycemic, antihypertensive, antipsychotic, and sedative medications increased falls by affecting patients' nervous system.

6. Conclusion
   A. Through theory synthesis, a comprehensive model that consisted of overall risk factors for falls were constructed.
   B. The constructed model may help nurses develop care plans for stroke patients to prevent falls.

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Author Summary: My clinical background is stroke rehabilitation. While I was working as a rehabilitation nurse in stroke unit, I met lots of stroke patients and it naturally developed my research interests. I am interested in stroke patients' safety problems, specifically, accidental falls in stroke patients. My major interests are prevention strategies to prevent falls in stroke patients and developing effective education methods to implement fall prevention strategies.