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Use of NANDA International Diagnosis in Frail Older Adults

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ABSTRACT

There is no single general definition of frailty in older adults available. While some authors describe it as a symptom, others define it as a comprehensive syndrome or an accumulation of functional deficits in the elderly. Scientific publications find that up to 25 percent of seniors are frail (Holmerová, 2007, p 100). The growth of senior frailty may be subject to multi-morbidity, adverse effects of medications, physical inactivity, malnutrition, loneliness or depression (Kalvach, 2008, p 122). Our aim was to find and analyse papers published abroad that were related to frailty in older adults, and subsequently use the results in the NANDA International system of nursing diagnoses. Relevant data were acquired with the help of the electronic databases Pubmed, Medline, ProQuest and Springer, and the search engine Google. A specific search strategy was employed. Based on the diagnostic algorithm of NANDA International, diagnostic elements were identified and nursing diagnoses determined. Nursing diagnoses of NANDA International seem adequate for the provision of nursing care to frail older adults.

KEY WORDS

frail, frailty, syndrome, the elderly, nursing diagnosis, NANDA International

INTRODUCTION

The incidence of frailty – a medical syndrome grows with the age of the older adult. From 65 to 70 it is 3% of older adults, while from 85 to 89 the incidence of frailty reaches 26% (Weber, 2008, p 47). Other studies put the incidence of frailty syndrome at 5 to 25 percent of older adults (Holmerová, 2007, p 100).

Frailty is a progressive disability, leading to the immobilization syndrome, terminal geriatric deterioration, and subsequent death. Frailty is linked to poor health, higher dependency on others for care, hospitalization and institutionalization of the older adult (Topinková, 2008, p 6). Although the term frailty is often mentioned in studies, especially those published abroad, a clear definition of the term is not available. Holmerová finds (2007, p 24) that the frailty syndrome is characterized by loss of muscle mass, muscle strength, fatigue, weakness, hypokinesia, slow and often unsteady gait, and impaired stability, which is associated with a higher risk of a fall. Frail seniors have a reduced appetite, lose body weight, and suffer from cognitive decline and depression (Holmerová et al., 2007, pp. 99-100). Linda Friedová and her team helped to clarify and evaluate the concept of frailty. According to them, geriatric frailty indicates the presence of at least three of the five essential features:

- weight loss, unintentional weight loss of at least 4.5 kg per year,
- perceived fatigue and exhaustion,
- muscle weakness, poor grip strength,
- slow walk,
- low level of physical activity (Fried et al., 2001, pp. 46–47).

Basic factors that contribute to the development of senior frailty include: genetic predisposition, functional and involutional morphological changes, pathological processes (inflammation, insulin resistance), multimorbidity, drug side effects, physical inactivity, malnutrition, cognitive deficit, depression, psychosomatic decompensation and maladaptation, outer environment (Kalvach, 2008, p 122). This list of factors is important also for the subsequent treatment. Since there is no causal treatment available in the case of geriatric frailty, it is necessary to influence the present changes and offset deficits. Of utmost importance is early detection of frailty syndrome, rapid intervention, and prevention, which should include the education of seniors, active screening, and surveillance of susceptible persons (Kalvach, 2008, p 127). The literature (e. g. Holmerová, 2007) mentions the importance of good diet and physi-

cal activity – the importance of lifestyle – in preventing the development of frailty.

As the number of very old seniors (Svobodová, 2012) continues to rise, the fragility syndrome is expected to grow as well, bringing along other problems such as increased hospitalization and institutional care, which will also be reflected in nursing care. General Nurse provides basic and specialized nursing care through the nursing process (Česko, 2011). The nursing process includes a nursing diagnosis; the diagnosed conditions determine the nursing planning, implementation, and evaluation (Herdman, 2010, p 3). As there is no uniform diagnostic classification system in the Czech Republic, the classification system NANDA International is used. The NANDA International system specifies 13 domains that reflect the pattern of functional health according to Gordon (Herdman, 2010, p 8). The NANDA International system of nursing diagnosis uses the diagnostic algorithm (Marečková, 2006, p 33). The diagnostic algorithm is based on the principle of finding at least one defining characteristic and one related factor, and on the confirmation of the definition to make the current nursing diagnosis. The determination of potential nursing diagnosis requires the identification of the risk factor and the confirmation of the diagnosis with a definition.

Health promoting diagnosis can be made based on the defining characteristic and definition (Marečková, 2006, pp. 36-39).

OBJECTIVE

To find and analyze international papers on frailty in older adults.

PARTIAL OBJECTIVE

Use the information found in the NANDA-I system of diagnosis.

METHODS

The study focused on frail seniors. The subject matter of the research was formulated into a research question: What professional papers published abroad that study frail older adults will be researched?

Data were sourced from international electronic databases – PubMed, Medline, ProQuest and Springer, and the search engine Google.

Sensitive search strategy was selected for the first phase of the search, which found a large number of papers covering wider aspects of the issue. Subsequently a specific search strategy was used, generating fewer but more query-specific results. The search used Boolean operators AND and OR and advanced options.

Before the search commenced, criteria were specified to facilitate the selection of the articles found. The criteria included: publication since 2000, surveyed group aged over 60 years (old age according to the WHO), papers published in English.

The following keywords were used in the search: frail – frailty – old – older – elder – elderly. The primary source for the search was the PubMed database. When searching the PubMed database, the title of the paper was to contain the following keywords: frail – frailty. Keywords old – older – elder – elderly were to appear in the title or the abstract of an article. The following limits were applied to the database: articles published in the last 10 years, articles written in English, clinical studies, respondents' age – 65 and older.

In spite of them, the search still produced a large number of publications on frail elderly. Most studies (especially randomized) focused on interventions that can be implemented into nursing care plans for frail older adults. However, this did not facilitate meeting the partial objective. Many of the matching articles were therefore eliminated after studying the titles and abstracts of the publications. Ultimately, after a detailed analysis, we selected 19 international papers on frail elderly.

These international articles were then analyzed and studied. Based on the information provided in the selected published articles, diagnostic elements in line with NANDA International were identified, and nursing diagnoses were determined using the diagnostic algorithm of NANDA. In the current nursing diagnoses, defining characteristics and related factors were identified based on the nursing diagnosis of NANDA International 2009–2011.

In the case of possible nursing diagnoses, risk factors were identified based on the nursing diagnosis of NANDA International 2009–2011. No health-promotion diagnoses were made.

Table 1 gives an overview of the information found concerning the issue of frail older adults. The publications are listed chronologically from 2000 to the present. The researched studies describe and analyze the issue of frail older adults, looking for links related to the frailty of the elderly (e. g. Bartali et al., 2006). Some publications also describe characteristics identified in the population of frail elderly (e. g. Andrew, Rockwood, 2007; Ma et al., 2009; Blaum et al., 2009). The authors focused on a correlation between the phenomena and the frailty syndrome (Bilotta, 2010).

The studies found suggest that there is a relationship between gender, social status, race, and the prevalence of senior frailty (Fried et al., 2001; Avila-Funes et al., 2008). For example, smoking (Hubbard et al., 2009)

and infections aggravate the progress of frailty in the elderly (Schmaltz et al., 2005).

RESULTS

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Table 2 and Table 3 list the nursing diagnoses of NANDA International. The nursing diagnoses were determined using the diagnostic algorithm of NANDA International.

The information necessary for the nursing diagnosis were obtained by analyzing and studying the information found in the international studies. By means of the diagnostic algorithm, 16 nursing diagnoses according to NANDA International were made.

DISCUSSION

The aim was to find evidence related to the frailty of older adults and apply it in nursing diagnosis based on NANDA International.

The authors of the surveyed publications differed in defining and evaluating frailty (Jones, 2004). Frailty was frequently assessed in line with Fried (e. g. Shardell et al., 2009; Blaum et al., 2009; Avila-Funes et al. 2008).

Our research indicates that the frailty of the elderly is more common in females (Fried et al., 2001; Rockwood et al., 2005; Avila-Funes et al., 2008), in higher age groups (Fried et al., 2001), in underprivileged individuals (Alvarado et al., 2008; Fried et al., 2001), those with lower education (Avila-Funes et al., 2008), among African Americans (Fried et al., 2001; Cawthon et al., 2007), in subjects with impaired cognitive functions (Andrew, Rockwood, 2007; Bilotta et al., 2010; Rockwood et al., 2005), smokers (Hubbard et al., 2009; Sirolo et al., 2011), people with low energy intake (Bartali et al., 2006), but also in people with obesity (Villareal et al., 2011; Blaum et al, 2005). Older adults with the frailty syndrome are prone to incontinence (Rockwood et al., 2005), depend on others for the activities of daily living (Boyd et al., 2005; Bilotta et al., 2010), are at risk of fracture (Ma et al., 2009) and hyperglycemia (Blaum et al., 2009). Frail older adults are often at risk of falls, including hip fracture (Herrick et al., 2004). Afflicted seniors often suffer from pain (Herrick et al., 2004). Progressive development of the frailty syndrome is also associated infection (Schmaltz et al., 2005).

The analysis of the generated studies revealed a problem similar to that described by Kalvach (2008, p 120) in his publication Geriatrické syndromy a geriatrický pacient (Geriatric Syndromes and the Geriatric Patient). Identification of typical factors of frailty is difficult because many factors can be both a cause and manifestation or consequence of frailty. By using the comprehensive classification system NANDA International, however, we managed to identify the diagnostic elements (defining characteristics, related factors, risk factors).

Nursing assessment is a comprehensive and above all an individual process. Different nursing diagnoses of NANDA International can be found for each frail older adult. We carried out the diagnostic process based on information found in the selected studies. In the final stage, 16 NANDA International nursing diagnoses were made based on the diagnostic algorithm of NANDA International, of which 4 were possible diagnoses. No health-promotion diagnosis was made.

Based on our analysis and by using the diagnostic algorithm, we found NANDA International nursing diagnoses that are applicable in nursing care plans for the frail elderly. However, we do not claim that the nursing diagnoses we found need to be made for all frail older adults. The following nursing diagnoses were found: Ineffective health maintenance 00099, Imbalanced nutrition: less than body requirements 00002, Imbalanced nutrition: more than body requirements 00001, Risk for unstable blood glucose 00179, Impaired urinary elimination 00016, Impaired physical mobility 00085, Fatigue 00093, Bathing self-care deficit 00108, Dressing self-care deficit 00109, Feeding self-care deficit 00102, Toileting self-care deficit 00110, Chronic confusion 00129, Risk for falls 00155, Risk for impaired skin integrity 00047, Risk for infection 00004, Chronic pain 00133. The findings may be applied in the NANDA International system of nursing diagnosis.

CONCLUSION

Older adults with the frailty syndrome are often in institutional care. This is caused by deterioration in their health and them depending on others with daily activities. Their comfort and quality of life are reflected in nursing care. The care plan includes nursing diagnosis,

Table 1 Findings on the issue of frail elderly

	AUTHOR	YEAR	INFORMATION FOUND
1	Fried et al.	2001	The incidence of frailty is related to: – *higher age* – *female sex* – *lower education and lower income* – *higher incidence of chronic diseases and associated disabilities* – *African-American population*
2	Herrick et al.	2004	*Pain – a frequent symptom in frail older adults after hip fracture*
3	Jones, Song, Rockwood	2004	Incidence of frailty is related to: – *functional decline* – *mental condition*
4	Rockwood et al.	2005	The incidence of frailty is related to: – *dementia* – *institutional care of the elderly* – *female sex* – *incontinence* – *limited mobility*
5	Boyd et al.	2005	The incidence of frailty is related to: – *dependence on others with activities in daily life*
6	Schmaltz et al.	2005	*Chronic infection (cytomegalovirus) is related to the incidence of frailty in women and increases its manifestations*
7	Blaum et al.	2005	*Obesity is linked with the development of the syndrome of frailty*
8	Bartali et al.	2006	The incidence of frailty is related to: – *low energy intake* – *low nutrient uptake*
9	Cawthon et al.	2007	The incidence of frailty is related to: – *African-American and Asian populations* – *physical deterioration*
10	Andrew, Rockwood	2007	The incidence of frailty is associated with: – *psychiatric illness*
11	Shardell et al.	2009	The incidence of frailty is associated with: – *vitamin D deficiency in men*
12	Blaum et al.	2009	The incidence of frailty is related to: – *hyperglycemia in women*
13	Alvarado et al.	2008	The incidence of frailty is related with: – *low socioeconomic status* – *gender*
14	Avila–Funes et al.	2008	The incidence of frailty is related to: – *female sex* – *older age* – *lower education* – *low income* – *higher number of chronic diseases* – *impaired health*
15	Ma et al.	2009	The incidence of frailty is related with: – *higher risk of fractures*
16	Hubbard et al.	2009	The incidence of frailty is related with: – *smoking, and promotes deterioration*
17	Bilotta et al.	2010	The incidence of frailty is related with: – *dementia* – *bathing self-care deficit* – *serious acute disease in the past year* – *depression*
18	Sirola et al.	2011	The incidence of frailty is related with: – *low body weight* – *physical weakness, inactivity* Smoking is a risk factor
19	Villareal et al.	2011	The incidence of frailty is related to: – *obesity*

Table 2 Current nursing diagnoses of NANDA International (Herdman, 2010)

Ineffective health maintenance 00099	
DC: – Lack of health-seeking behaviour in the medical history (smoking)	SF: – insufficient resources – technical, material, and financial – cognitive impairment
Imbalanced nutrition: less than body requirements 00002	
DC: – body weight 20% or more below ideal weight – lack of food	SF: – biological factors – inability to eat
Imbalanced nutrition: more than body requirements 00001	
DC: – weight of 20% over ideal for height and frame	SF: – excessive nutrient intake in relation to metabolic needs
Impaired urinary elimination 00016	
DC: – incontinence	SF: – chronic infection – multiple causality
Impaired physical mobility 00085	
DC: – gait changes – slowed movement, foot shuffling	SF: – loss of fitness – loss of muscle mass – loss of muscle strength – malnutrition – cognitive impairment – slowed movement
Fatigue 00093	
DC: – lack of energy – fatigue	SF: – poor physical condition – malnutrition
Bathing self-care 00108	
DC: – inability to wash body – inability to dry body	SF: – weakness – fatigue – cognitive impairment
Dressing self-care deficit 00109	
DC: – inability to wear put clothing on lower body – inability to put clothing on upper body – inability to remove clothing	SF: – weakness – fatigue – cognitive impairment
Feeding self-care deficit 00102	
DC: – inability to eat enough food	SF: – weakness – fatigue – cognitive impairment
Toileting self-care deficit 00110	
DC: – inability to carry out proper toilet hygiene	SF: – weakness – fatigue – cognitive impairment
Chronic confusion 00129	
DC: – long-lasting cognitive impairment	SF: – dementia
Chronic pain 00133	
DC: – reports pain	SF: – chronic disability

Table 3 Possible nursing diagnoses of NANDA International (Herdman, 2010)

Risk for unstable blood glucose 00179
RF: – physical condition
Risk for falls 00155
RF: – age 65 or older – diminished mental status – incontinence – difficulty with gait – impaired physical activity
Risk for impaired skin integrity 00047
RF: – physical immobilization – moisture from excretions, secretions – immunological factors – unbalanced nutrition
Risk for infection 00004
RF: – malnutrition – chronic disease – inadequate primary/secondary defences

based on which appropriate nursing interventions can be specified that will help solve the nursing problem.

In line with our findings, nursing diagnoses of NANDA International seem appropriate in providing nursing care to frail older adults.

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REFERENCES

ALVARADO, B. E. et al. 2008. Life course social and health conditions linked to frailty in Latin American older men and women. *The Journals of gerontology.* 2008, vol. 12, no. 63, p. 1399–1406. ISSN 1079-5006.

AVILA-FUNES, J. A. et al. 2007. Frailty among community-dwelling elderly people in France: the three-city study. *The Journals of gerontology.* 2008, vol. 10, no. 63, p. 1089–1096. ISSN 1079-5006.

ANDREW, M. K., ROCKWOOD, K. 2006. Psychiatric illness in relation to frailty in community-dwelling elderly people without dementia: a report from the Canadian Study of Health and Aging. *Canadian Journal on Aging*. 2007, vol. 1, no. 26, p. 33. ISSN 0714-9808.

BENEDETTA, B. et al. 2006. Low Nutrient Intake Is an Essential Component of Frailty in Older Persons. *The Journals of gerontology*. 2006, vol. 6, no. 6, p. 589–593. ISSN 1079-5006.

BILOTTA, C. et al. 2010. Social vulnerability, mental health and correlates of frailty in older outpatients living alone in the community in Italy. *Aging and Mental Health.* 2010, vol. 14, no. 8, p. 1024–1036. ISSN 1360-7863.

BLAUM, C. et al. 2009. Is Hyperglycemia Associated with Frailty Status in Older Women? *Journal of the American Geriatrics Society*. 2009, vol. 5, no. 57, p. 840–847. ISSN 0002-8614.

BLAUM, C. et al. 2009. The Association Between Obesity and the Frailty Syndrome in Older Women: The Women's Health and Aging Studies. *Journal of the American Geriatrics Society*. 2005, vol. 6, no. 53, p. 927–934. ISSN 0002-9614.

BOYD, C. et al. 2005. Frailty, hospitalization, and progression of disability in a cohort of disabled older women. *The American Jurnal of Medicine.* 2005, vol. 11, no. 118, p. 1225–1231. ISSN 0002-9343.

CAWTHON, P. et al. Frailty in Older Men: Prevalence, Progression, and Relationship with Mortality. *Journal of the American Geriatrics Society*. 2005, vol. 8, no. 55, p. 1216–1223. ISSN 0002-8614.

CZECH REPUBLIC. Decree No. 55 of 14 March 2011 regulating the activities of health care staff and other professionals. In Collection of Laws of the Czech Republic. 2011, Chapter 20, pp. 482–544.

FRIED, L. et al. 2001. Frailty in older adults: evidence for a phenotype. *The Journals of gerontology*. 2001, vol. 3, no. 56, p. 46–56. ISSN 1079-5006.

HERDMAN, T. H. (translated by KUDLOVÁ, P.). 2010. *Ošetřovatelské diagnózy: definice & klasifikace*. 1st ed. Prague: Grada, 2010. 245 p. ISBN 978-80-247-3423-1.

HERRICK, C. et al. 2004. Persistent Pain in Frail Older Adults after Hip Fracture Repair. *Journal of the American Geriatrics Society*. 2004, vol. 12, no. 52, p. 2062–2068. ISSN 0002-8614.

HOLMEROVÁ, I. 2007. Křehkost vyššího věku a sarkopenie jako její důležitá komponenta. *Česká geriatrická revue.* 2007, vol. 5, no. 1, pp. 24–32. ISSN 1214-0732.

HOLMEROVÁ, I. et al. 2007. Vybrané kapitoly z gerontologie. *EV public relations*. 2007. [online]. Available at WWW: http://www.geriatrie.cz/dokumenty/VybrKapZGerontologie.pdf. ISBN 978-80-254-0179-8.

HUBBARD, R. E. et al. 2009. Effect of smoking on the accumulation of deficits, frailty and survival in older adults: a secondary analysis from the Canadian study of health and aging. *The Journal of Nutrition, Health & Aging*. 2009, vol. 5, no. 13, p. 468–472. ISSN 1260-4788.

JONES, D., SONG, X., ROCKWOOD, K. 2004. Operationalizing a Frailty Index from a Standardized Comprehensive Geriatric Assessment. *Journal of the American Geriatrics Society*. 2004, vol. 52, no. 11, p. 1929–1933. ISSN 0002-8614.

KALVACH, Z. 2008. *Geriatrické syndromy a geriatrický pacient*. 1st ed. Prague: Grada, 2008. 336 p. ISBN 978-80-247-2490-4.

ROCKWOOD, K. et al. 2005. A global clinical measure of fitness and frailty in elderly people. *Canadian Medical Association Journal*. 2005, vol. 5, no. 173, p. 489–495. ISSN 0820-3946.

MA, S. L. et al. 2009. Self-reported frailty is associated with low calcaneal bone mineral density in a multiracial population of community-dwelling elderly. *Osteoporosis International*. 2009, vol. 20, no. 11, p. 1837–1846. ISSN 0937-941X.

MAREČKOVÁ, J. 2006. *Ošetřovatelské diagnózy v NANDA doménách*. 1st ed. Prague: Grada, 2006. 246 p. ISBN 80-247-1399-3.

SHARDELL, M. et al. 2009. Association of Low Vitamin D Levels With the Frailty Syndrome in Men and Women. *The Journals of gerontology*. 2009, vol. 64A, no. 1, p. 69–75. ISSN 1079-5006.

SCHMALTZ, H. et al. 2005. Chronic Cytomegalovirus Infection and Inflammation Are Associated with Prevalent Frailty in Community-Dwelling Older Women. *Journal of the American Geriatrics Society*. 2005, vol. 5, no. 53, p. 747–754. ISSN 0002-8614.

SIROLA, J. et al. 2011. Definition of frailty in older men according to questionnaire data (RAND-36/SF-36): The Helsinki Businessmen Study. *The Journal of nutrition, health & aging*. 2011, vol. 15, no. 9, p. 783–787. ISSN 1279-7707.

SVOBODOVÁ, K. 2012. *ANALÝZA: Demografické stárnutí ČR podle výsledků projekce*. [online]. 23. 3. 2012. [cit. 2012-04-01]. Available at WWW: http://www.demografi e.info/?cz_detail_clanku&artclID=824. ISSN 1801-2914.

TOPINKOVÁ, E. 2008. Aging, Disability and Frailty. *Nutrition & Metabolism*. 2008 vol. 52, suppl. 1, p. 6–11. ISSN 1743-7075.

VILLAREAL, D. et al. 2011. Regular Multicomponent Exercise Increases Physical Fitness and Muscle Protein Anabolism in Frail, Obese, Older Adults. *Obesity and Research Journal*. 2011, vol. 2, no. 19, p. 312–318. ISSN 1930-739X.

WEBER, P. 2008. "Frailty" – stařecká křehkost – aktuální problém na prahu 3. tisíciletí. *Interní medicína pro praxi*. 2008, vol. 10, no. 2, p. 47. ISSN 1212-7299.

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