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**REVIEWING THE FALLS IN INDIVIDUALS WITH
DEMENTIA: CAUSES, CONSEQUENCES, PREVENTION
STRATEGIES. THE VITAL CONTRIBUTION OF
NURSING PROFESSIONALS**

**Upadki u osób z demencją: przyczyny, konsekwencje, strategie zapobiegania.
Istotny wkład personelu pielęgniarского.**

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A - Koncepcja i projekt badania, B - Gromadzenie i/lub zestawianie danych, C - Analiza i interpretacja danych, D - Napisanie artykułu, E - Krytyczne zrecenzowanie artykułu, F - Zatwierdzenie ostatecznej wersji artykułu

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Abstract (in Polish):

Upadki u starszych osób z demencją stanowią znaczący problem zdrowia publicznego, który wpływa na ich zdrowie fizyczne, dobre samopoczucie psychiczne, życie społeczne i stabilność ekonomiczną. Wraz z rosnącą częstością występowania demencji na całym świecie, wpływ upadków prawdopodobnie wzrośnie w nadchodzących dziesięcioleciach. W niniejszym przeglądzie zidentyfikowano wiele czynników ryzyka związanych z upadkami u osób z demencją, w tym biologiczne, behawioralne, środowiskowe oraz socjoekonomiczne. Wciąż jednak istnieją niewiadome dotyczące czynników ryzyka upadków u osób z demencją przed ich rozpoznaniem. Ważne jest, aby podjąć wysiłki na rzecz opracowania skutecznych interwencji, które zapobiegą upadkom i ograniczą wpływ urazów na zdrowie oraz jakość życia pacjentów. Zbadano i opracowano wiele strategii zapobiegania upadkom, wśród których znalazły się m.in. regularna aktywność fizyczna, odpowiednia modyfikacja domów osób szczególnie narażonych na upadek, ale też odpowiednia dbałość o bezpieczeństwo w środowiskach szpitalnych. Pracownicy ochrony zdrowia, w tym pielęgniarki, powinni być świadome zwiększonego ryzyka urazów u pacjentów z demencją i podejmować odpowiednie kroki w celu zapobiegania im. Wśród interwencji pielęgniarstkich kluczową rolę w zapobieganiu upadkom u pacjentów z demencją odgrywa edukacja, obejmująca identyfikację czynników ryzyka, bezpieczne techniki chodzenia oraz podejścia dostosowane do indywidualnych potrzeb pacjenta. Poprzez zwiększenie naszej wiedzy na temat czynników ryzyka upadków u tej podatnej populacji oraz wprowadzenie skutecznych interwencji pielęgniarstkich, możemy zmniejszyć obciążenie wynikające z upadków oraz poprawić ogólny stan zdrowia i samopoczucie pacjentów z demencją.

Abstract (in English):

Falls in elderly individuals with dementia represent a significant public health problem that affects patients' physical health, psychological wellbeing, social life, and economic stability. With the growing prevalence of dementia worldwide, the impact of falls is likely to increase in the coming decades. This review has identified multiple risk factors associated with falls in people with dementia, including biological, behavioral, environmental, and socioeconomic factors. However, there is still a knowledge gap in the risk factors for falls in people with dementia before their diagnosis. Efforts are needed to develop effective interventions that can prevent falls and minimize the impact of injuries on patients' health and quality of life. Many strategies for preventing falls have been studied and developed, including regular physical activity, appropriate modification of the homes of individuals particularly susceptible to falls, as well as proper attention to safety in hospital environments. Healthcare providers, including nurses, should be aware of the increased risk of injuries in patients with dementia and take appropriate measures to prevent and manage them. Nursing interventions such as education on the identification of risk factors, safe ambulation techniques, and patient-specific interventions can play a significant role in preventing falls in patients with dementia. By improving our understanding of the risk factors for falls in this vulnerable population and implementing effective nursing interventions, we can reduce the burden of falls and improve the overall health and wellbeing of patients with dementia.

Keywords (in Polish): demencja, czynniki ryzyka, upadki, prewencja.

Keywords (in English): dementia, risk factors, prevention, falls.

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Authors (short)

A. Dziekiewicz et al.

Introduction

Falls are a major public health problem as evidenced by data presented by the World Health Organization (WHO), where they are the second most common cause of unintentional injuries worldwide [1]. According to the WHO definition, a fall is defined as an event in which a person unintentionally comes to rest on the ground, floor or other lower level [2]. Falls are a medical problem affecting a significant portion of society at any age. Based on the Centers for Disease Control and Prevention's (CDC) findings, unintentional falls are the leading cause of fatal and non-fatal injuries in adults aged 65 and older. However, there are many risk factors that predispose to this phenomenon, including environmental, biological, socioeconomic, and behavioral factors [2–4]. Each year, an estimated 37 million falls requiring medical care are recorded, with falls accounting for 96.2% of all hospital accidents [5]. The risk of patient falls may be elevated during hospitalization, as a result of both the new, unfamiliar environment and the presence of co-existing medical conditions or medications [6].

Falls affect many aspects of human functioning. Patients experience a broad decline in quality of life, with a particular focus on the consequences related to the patient's physical health, such as injuries and loss of some life functions. They often lead to psychological disorders, as well as social and economic problems [7–9]. Patients complaining of neurological problems, including those with dementia, are particularly prone to falls. Studies have found that falls occur in around 60% of older individuals with dementia annually, compared to a lower rate in those without neurological disorders [10]. Additionally, research indicates that up to 46% of patients with various neurological disorders experience at least one fall per year [11].

The aim of this study is to present the problem of falls in elderly individuals with dementia, as well as the possibility of their assessment and prevention based on the analysis of the available literature on the subject. Through a comprehensive review of the literature, we will explore the various risk factors for falls in this population, including environmental, biological, socioeconomic, and behavioral factors. We will also examine the current approaches to fall prevention and management,

with a particular focus on the role of assessments in identifying patients at risk and implementing effective interventions. By the end of this study, we hope to provide a deeper understanding of falls in elderly patients with dementia and offer valuable insights into how best to prevent and manage this common medical problem.

Materials and Methods

As we worked on our research, we conducted extensive searches through several online databases, including PubMed and Google Scholar. We utilized a variety of search terms and combinations of phrases, carefully selecting titles that included the following terms: “falls in dementia”, “fall risk factors in people with dementia”, “fall prevention in older people with dementia”, “multifactorial falls prevention”, “geriatric care”, “nursing care of people with dementia”, “fall injury”, “dementia” and “nurse”. In total, we analysed 143 articles, from which we finally selected 41 articles that we considered most related to our work. We made sure to eliminate any articles that were not relevant to falls in individuals with dementia, as well as those that did not pertain to the competencies and expertise of nursing staff. This ensured that our research was focused and targeted towards the specific areas of interest that were pertinent to our study.

Dementia and its impact on falls and injuries: understanding the disease and its physical consequences

Dementia is a very common disease, affecting about 47 million people, and this number may increase to 131 million by 2050 [11]. It is characterized by a gradual loss of memory and other cognitive functions, making it difficult for patients to carry out daily activities. Dementia can result from various pathophysiological processes, with the most common cause being Alzheimer’s disease, which accounts for 50-75% of all cases of dementia [12]. As the disease progresses, patients begin to experience difficulties with balance, motor coordination, and overall physical fitness, which increases the risk of falls and other injuries. Furthermore, individuals with dementia may be less likely to report pain and discomfort associated with injuries, which can lead to delays in their diagnosis and treatment. Falls in dementia can have significant impacts on patient health and quality of life. They can lead to decreased mobility, increased dependence on caregivers, and even premature death [13]. As such, it is important for healthcare providers to be aware of the increased risk of injuries in patients with dementia, and to take appropriate measures to prevent and manage them.

Main risk factors for falls in people with dementia

There are multiple factors that contribute to falls in people with dementia, including changes in physical function, sensory impairment, and cognitive decline. Many of these factors are interrelated and can compound one another, creating a complex and challenging landscape for healthcare providers. The consequences of falls are significant and associated with mortality, morbidity, hospitalisation, and substantial economic costs [14]. The main risk factors for falls in people with dementia can be classified into four categories: biological, behavioral, environmental, and socioeconomic (Table 1).

A spot for “Table 1”.

**Table 1 – Main risk factors for falls in people with dementia.
Główne czynniki ryzyka upadków u osób z demencją.**

Risk factor dimension	Examples of risk factors
Biological	<ul style="list-style-type: none"> • Aging • Sex • Chronic diseases • Deterioration of physical, cognitive, emotional abilities
Behavioral	<ul style="list-style-type: none"> • Taking multiple medications • Alcohol abuse • Lack of physical activity
Environmental	<ul style="list-style-type: none"> • Hazards in the place of residence • Slippery stair surface • Insufficient lighting • Poor building design • Cracked or uneven sidewalks • Poor lighting in public places
Socioeconomic	<ul style="list-style-type: none"> • Low income • Low education • Lack of social interaction • Inadequate housing conditions • Limited access to health and social care

Therefore, identifying and addressing the risk factors associated with falls is crucial in preventing these incidents. In this regard, a comprehensive understanding of the risk factors involved is necessary to develop effective interventions [2, 15, 16]. Individuals with dementia, however, may face a different set of risk factors due to biological (e.g. cognitive decline), behavioral (e.g. medication use), and socioeconomic changes (e.g. reduced social interactions) [17, 18]. Unfortunately, the majority of studies that have investigated the risk factors for falls were conducted in two specific groups: (1) people who have normal cognitive function and do not have dementia, and (2) people who have already been diagnosed with dementia or Alzheimer’s disease during the post-diagnostic period [19, 20]. These studies did not specifically compare the risk factors for falls among those with dementia before and after their dementia diagnosis [21–23]. Zhang et al. (2022) conducted a study to identify when injurious falls increase among those likely to develop dementia and the highest risk time point for those living with dementia. It is one of the first comprehensive efforts to pinpoint the temporal relationship between falls and dementia onset, shedding light on a critical issue overlooked in previous research. The findings can inform targeted interventions to reduce fall risk among older adults, especially those with dementia [24]. Therefore, there is a gap in knowledge about the risk factors for falls in people with dementia prior to their diagnosis, and this is an area that needs further investigation.

In addition to the factors that predispose individuals with dementia to falls, other elements also contribute to their occurrence. These elements comprise medication use, comorbidities, and poor nutritional status. Particularly, psychotropic medications have been proven to raise the likelihood of falls in people with dementia. Furthermore, inadequate nutritional status, including malnutrition and dehydration, can also intensify the propensity of falling among this population [25]. As exposure to these factors increases, so does the probability of experiencing a fall and being injured. Identifying

and addressing these elements is crucial in preventing falls and promoting safety for individuals with dementia [26–28].

Nursing plays a vital role in identifying and addressing fall risk factors in people with dementia. Nurses can assess and monitor cognitive, physical, and sensory function, identify medication-related fall risk factors, and evaluate the safety of the patient's environment. Additionally, nursing interventions such as exercise programs, medication review, and environmental modifications can effectively reduce the risk of falls in people with dementia [29, 30].

The effects of falls in people with dementia

Falls can lead to significant physical, psychological, and economic consequences, making them a major public health concern [31–34]. Komisar et al. (2022) showed in their work that injuries occurred in 38.2% of falls, and 85.9% of these injuries directly affected the damaged body part [35]. Terreso et al. (2014) made a detailed analysis of the frequency of fall consequences based on the available literature, showing their percentage share. The largest percentage was represented by hip fractures and other unspecified fractures [36]. Stubbs et al. (2020) also found that people with dementia have a particularly high risk of falls and hip fractures compared to the population without these disorders. Bruising, which mainly localized on the head, was also very common. Patients experienced mainly soft tissue injuries during falls, but also upper limb injuries or brain injuries occurred. Patients often suffered from dislocations, sprains, and were exposed to the development of hematomas or wounds [37]. Schonnop et al. (2013) note that falls account for over 60% of head injuries in older people, while in Wit et al. (2020), it is mentioned that about 5% of patients presenting to the emergency room due to falls have intracranial bleeding [38, 39].

The economic impact of falls should not be overlooked. It can be related to hospitalization, treatment, diagnosis, but also long-term care for the patient in other facilities or at home. It has a particularly significant impact on the family caring for the patient, but also on the whole society and the economy [8]. According to the CDC, about 50 billion dollars are spent each year on medical costs associated with non-fatal fall injuries, and about 754 million dollars on fatal falls [3, 40]. These costs can be divided into direct costs: (1) those related to healthcare costs, among others, and (2) indirect costs caused by the loss of productivity due to the inability to perform activities that would be performed if the fall did not occur [2].

It should be noted that an important but often overlooked consequence of falls are psychological disorders. Many studies have shown a strong correlation between falls and depression [33, 36, 41]. It has also been shown that falls result in fear of further falls, which is associated with a limitation of patients' physical activity and, as a result, reduces their mobility and balance [41]. Patients seek to ensure their safety by avoiding walking [42]. Special attention should also be paid to the adverse effects of medications prescribed to treat depression, which directly and indirectly contribute to further falls [41]. Moreover, falls can also result in loss of confidence or autonomy, which can lead to social isolation [36, 42, 43]. In a study conducted by Hajek et al. (2019), it was shown that experiencing a fall within 12 months resulted in a decreased perception of autonomy [43].

Falls also have a significant impact on nursing staff. King et al. (2018) pointed out that nurses are often the ones who are injured due to the falls of the patients they care for. This leads to increased stress, loss of confidence in the quality of their work, as well as feelings of guilt. Just like patients, they develop a fear of further falls [44].

Fall prevention strategies

Given the serious consequences of falls and the prevalence of this phenomenon, many fall prevention strategies have been developed. Effective public health interventions effectively prevent falls and consequently their complications [8, 45].

Special attention is paid to regular physical activity, including strength-building exercises, improving gait, and improving balance. Sherrington et al. (2019) found in their study that exercise reduces the number of falls by 25%. Their research showed that balance training and functional training, in particular, reduced the number of falls compared to physically inactive individuals. Programs that include a variety of exercises such as balance, functional, and resistance training likely also contribute to reducing their frequency. Tai Chi is also mentioned as helping to prevent falls [46].

To prevent falls, it is also important to ensure adequate home preparation and modify spaces that may pose direct or indirect fall risks. Due to the fact that most falls occur at home, the home environment is an important place for preventive actions [47, 48]. A randomized controlled trial conducted in New Zealand to prevent home injuries found that injury rates from falls were 26% lower in modified homes than in unmodified homes. Home modifications included, among others, installing toilet rails, proper lighting, securing carpets with uneven edges, or using anti-slip mats [49, 50].

Due to the frequency of falls in hospitals and nursing homes, many recommendations have been made to minimize their risk in these settings. Schoberer et al. (2022) advocated for a fall risk assessment, taking into account predisposing factors for its occurrence. Special attention is paid to patients whose falls are recurrent. The value of educational and advisory interventions for both patients and staff are also emphasized. Workshops, scientific conferences, and informative brochures are encouraged. Similar to non-hospital settings, patients should have access to appropriate physical activity and rehabilitation. It is also recommended to select appropriate footwear, as wearing slippers has been identified as an external factor of high fall risk. Careful selection of medications, along with patient observation after administration, is also important [51].

The nursing staff is a critical component in preventing patient falls. With 24/7 contact with patients and vigilant observation of changing conditions, nurses can quickly respond to and prevent falls. They also play an essential role in monitoring patients' food and medication intake to minimize the external risk factors for falls [44, 52, 53].

Post-Fall Care for Patients with Dementia

Providing appropriate post-fall care is essential for the well-being of patients with dementia. Nurses play a vital role in post-fall care, as they are responsible for assessing patients' injuries, providing treatment, and implementing fall prevention strategies to prevent future falls. Post-fall care of people with dementia is crucial for improving their physical and psychosocial outcomes. Several studies have investigated the best practices and interventions for post-fall care of people with dementia [54–58].

One important aspect of post-fall care for people with dementia is the assessment of the risk of recurrent falls [59, 60]. According to a study by Dev et al. (2021), comprehensive assessment tools should be used to evaluate the risk of recurrent falls in people with dementia [61]. In addition, a study by Carrasco et al. (2020) highlighted the importance of considering individualized risk factors such as gait and balance impairments, cognitive deficits, and medication use [62].

Another crucial component of post-fall care for people with dementia is the provision of tailored rehabilitation programs. The research study by Laver et al. (2020) suggested that multidisciplinary rehabilitation programs, which include exercise, cognitive training, and environmental modifications, can significantly reduce the risk of recurrent falls and improve physical functioning in people with dementia [63]. Similarly, a study by Sondell et al. (2021) found that balance and strength training programs can improve balance and mobility outcomes in people with dementia following a fall [64].

In addition to rehabilitation programs, post-fall care for people with dementia should also focus on addressing psychosocial consequences such as fear of falling and social isolation. A study by Liu et al. (2018) found that cognitive behavioral therapy can effectively reduce fear of falling and improve physical functioning in older adults who have excessive or undue fear of falling [65]. Moreover, the study by Taraldsen et al. (2020) highlighted the importance of social engagement and participation in activities for improving psychosocial outcomes in people with dementia [66].

Lastly, effective communication and collaboration among healthcare professionals involved in the care of people with dementia following a fall are crucial for ensuring optimal outcomes. The DIFRID study by Wheatley et al. (2019) emphasized the importance of equipping the workforce with the necessary skills and information to care for this patient group [58]. In addition, numerous studies have demonstrated the effectiveness of a multidisciplinary approach that involves healthcare professionals from various disciplines in providing comprehensive and coordinated care for individuals with dementia after experiencing a fall [67–69].

Conclusions

Falls in elderly individuals with dementia represent a significant public health problem that affects patients' physical health, psychological wellbeing, social life, and economic stability. With the growing prevalence of dementia worldwide, the impact of falls is likely to increase in the coming decades. This review has identified multiple risk factors associated with falls in people with dementia, including biological, behavioral, environmental, and socioeconomic factors. However, there is still a knowledge gap in the risk factors for falls in people with dementia before their diagnosis. Efforts are needed to develop effective interventions that can prevent falls and minimize the impact of injuries on patients' health and quality of life. Healthcare providers, particularly nurses, need to be aware of the increased risk of injuries in patients with dementia and take appropriate measures to prevent and manage them. By improving our understanding of the risk factors for falls in this vulnerable population and implementing effective interventions, nursing professionals can play a crucial role in reducing the burden of falls and improving the overall health and wellbeing of patients with dementia.

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