journal homepage: http://kont.zsf.jcu.cz
DOI: 10.32725/kont.2019.013

KONTAKT / Journal of nursing and social sciences related to health and illness

Original research article

Influence of gender on the prevalence of behavioral symptoms in patients with Alzheimer's dementia

Jana Martinková, Oľga Kabátová *, Silvia Puteková

Trnava University in Trnava, Faculty of Health Care and Social Work, Department of Nursing, Trnava, Slovak Republic

Abstract

*Introduction:*The prevalence of behavioral symptoms in a patient with Alzheimer's dementia is one of the factors that significantly affects nursing care. It is a major problem of nursing care and the main cause of institutionalization and increased costs.
Design: For this research, the design of a prospective quantitative study based on the assessment scale was chosen.
Objective: The aim of the research was to map out the prevalence of behavioral symptoms, the manifestations of problem behavior in Alzheimer's dementia patients, and to determine the influence of gender on individual manifestations.
Methodology: We used the Cohen-Mansfield Agitation Inventory (CMAI) to assess behavioral symptoms; problem behavior of patients with Alzheimer dementia. We statistically processed the results using the Mann–Whitney *U* test. The survey sample consisted of 413 patients who were randomly assigned to the sample.
Results: The incidence of behavioral symptoms and behavioral problems in up to 92% of patients was detected with the scale (54 average rank). The problem was higher in man than in women (49 average rank), but this difference was only random and did not reach statistical significance (p = 0.273). Concerning aggressive behavior, we note that there is a statistically significant difference (p = 0.038) in the manifestations of aggressive behavior between men and women. There is no statistically significant difference in the manifestations of physically nonaggressive behavior (p = 0.098) and verbal restlessness (p = 0.220) between men and women.
Conclusions: The problem of prevalence of behavioral symptoms, problem behavior in patients with Alzheimer's dementia, is highly relevant. Finally, we can state that gender does not have an unambiguous influence on behavioral symptom manifestations, problem behavior in patients with Alzheimer's dementia.

Keywords: Alzheimer's dementia; Behavioral symptoms; Nursing care; Problem behavior; Senior

Introduction

The occurrence of behavioral symptoms in a patient with Alzheimer's dementia is one of the factors that significantly affects nursing care. These symptoms have a significant impact on the quality of life of the patient, they can predict a more serious course of illness, more extensive neurodegeneration, loss of functional independence, institutionality, and early death (Li et al., 2014).

The decline in emotional control, motivation, and the change in social behavior is manifested by emotional lability, irritability, apathy and inappropriate social behavior. The occurrence of behavioral symptoms is associated with a rapid decline in cognitive function, which aggravates daily life activities (Hersch and Falzgraf, 2007). Symptoms of behavioral symptoms are often the reason for seeking expertise and hospitalization, leading to a transition to structured environments and institutionalized care. These manifestations are the main cause of lower quality of life for Alzheimer's dementia patients (Dorey et al., 2008).They are also difficult to manage, so assessment is important with the effective consideration of interventions (Madhusoodanan and Ting, 2014). Research studies have a prevalence of behavioral symptoms ranging from 50% to 100% (Neil and Bowie, 2008). (Davidson et al., 2017). Donnelly (2005) states that the behavioral and psychological symptoms of Alzheimer's dementia may be one of the most challenging problems that the nurse encounters during nursing care. The nurse should be able to cope with any manifestation of problem behavior (Livingston et al., 2017) and is oriented to the individual needs of the patient that are modified due to the disease (Dlugošová and Tkáčová, 2010).

The basis of successful care management is to identify behavioral symptoms, to monitor interventions and adverse effects, to maximize the psychic and physical potential of the patient, thereby minimizing stress among healthcare workers. Alzheimer's dementia is accompanied by a wide range of behavioral symptoms. Behavioral disorders can be defined as behavioral or mental syndrome associated with subjective discomfort, functional disability, or disorder of interaction with the external environment (Lyketsos et al., 2000). There are three major psychosocial theoretical models that have been

* **Author for correspondence:** Oľga Kabátová, Trnava University in Trnava, Faculty of Health Care and Social Work, Department of Nursing, Univerzitné nám. 1, 917 43 Trnava, Slovak Republic; e-mail: olga.kabatova@truni.sk
http://doi.org/10.32725/kont.2019.013

Submitted: 2018-07-27 • Accepted: 2019-01-22 • Prepublished online: 2019-02-06
KONTAKT 21/1: 74–79 • EISSN 1804-7122 • ISSN 1212-4117

used to explain behavioral symptoms (inappropriate behavior) in patients with Alzheimer's dementia. The first model is defined as a model of unsatisfied needs. Unsatisfied needs are perceived as a possible cause of problem behavior. These causes are often undefined or care staff cannot satisfy them. Among the unmet needs, we can include limited mobility, sleep mode, patient discharge, unidentified pain, infections, inappropriate communication, loneliness, boredom, sense deprivation and inappropriate treatment. The second model is defined as a behavioral one, which deals with the learning of the patient's behavior that needs to be strengthened, and behavior that is inappropriately evolving due to the disease. Due to the disease, the behavior of the patient changes, and more and more often inappropriate behavior manifests. The third model is a model of environmental vulnerability. It is based on the assumption that the disease process causes an increased response to the environment. Patients are gradually losing their ability to perceive the environment, which is stressful. This condition leads to tension and anxiety, resulting in manifestations of problem behavior (Hall, 1994).

Various factors may affect the occurrence of behavioral symptoms. Kučerová (2006) mentions gender as one of the risk factors for the development of Alzheimer's dementia. Fiest et al. (2016) and Miech et al. (2002) consistently state that the prevalence of the disease is higher in women than in men. This is explained by the fact that women live on average longer than men, and higher age is the greatest risk factor in the disease, but there is no evidence that women are more likely to have Alzheimer's dementia than men at that age. Apostolova et al. (2014) mention that men have a higher risk of behavioral symptoms.

The aim of the study was to map the prevalence of behavioral symptoms in Alzheimer's dementia patients and to determine the influence of gender on the prevalence of individual behavioral symptoms.

Materials and methods

For this research, the design of a cross-sectional quantitative study based on a questionnaire survey was selected.

The choice of respondents was deliberate. The criterion of inclusion of the respondent in the research sample was the diagnosis of Alzheimer's dementia and the placement in a specialized device for patients with dementia. The total was 413 respondents, of whom 278 (67%) were women and 135 (33%) men. The youngest respondent was 60 years old and the oldest was 92 years old. The average age of respondents was 76.8 years. Despite the fact that the set of respondents was not evenly distributed, the groups were statistically comparable.

We used the Cohen-Mansfield Agitation Inventory (CMAI) to assess behavioral symptoms in patients with Alzheimer's dementia. The assessment result contains 29 items which are behavioral symptoms and manifestations of problem behavior. Items include verbally aggressive and nonaggressive expressions, and physically aggressive and non-aggressive expressions. We added the assessment scale to the patient's gender. Individual items were ranked according to their occurrence: never, less than once a week, 1 to 2 times a week, several times a week, twice a day, several times a day, several times per hour. Each patient was assessed on the basis of observations and records from medical records in the last 14 days. The scores of all items together form a variable problem behavior, which according to the manual consists of three factors: aggressive behavior (kicking, grabbing, scratching, handling things inappropriately, cursing or verbal aggression, biting, spitting), physically nonaggressive behaviors (inappropriate dress or disrobing, trying to get to a different place, handling things inappropriately,hoarding things,general restlessness, performing repetitive mannerisms) and verbal restless behavior (complacency, constant unwarranted request for attention or help, negativism, repetitive sentences or questions, strange noises (weird laughter or crying)). For each factor, a single score was calculated. The research was carried out in the period from March 2015 to March 2018 in a specialized health facility for patients with dementia in the Trnava region.

Results

The prevalence of behavioral symptoms (Table 1) is high in patients with Alzheimer's dementia. Our research found that out of a total of 413 patients placed in a specialized device for patients with dementia, at least one of the behavioral symptoms occurred in 380 (92%) of respondents. None of the behavioral symptoms occurred in 33 (8%) of respondents.

Table 1. Overview of behavioral symptom prevalence in our research sample

No.	Behaviour	%	No.	Behaviour	%
1.	trying to get to a different place	77	16.	spitting	13
2.	pacing, aimless wandering	65	17.	tearing things or destroying property	9
3.	performing repetitive mannerisms	56	18.	hitting (including self)	8
4.	general restlessness	50	19.	kicking	7
5.	negativism	46	20.	scratching	6
6.	hoarding things	40	21.	grabbing onto people	6
7.	inappropriate dress or disrobing	34	22.	throwing things	5
8.	hiding things	34	23.	hurting self or others	5
9.	screaming	32	24.	eating / drinking inappropriate substance	4
10.	handling things inappropriately	32	25.	biting	4
11.	strange noises (weird laughter or crying)	25	26.	pushing	2
12.	complaining	21	27.	intentional falls	1
13.	cursing or verbal aggression	19	28.	making physical sexual advances	1
14.	repetitive sentences or questions	18	29.	making verbal sexual advances	1
15.	constant unwarranted request for attention or help	16			

% relative abundance

Among the most common behavioral symptoms (Table 1) that occurred in our research sample was *"trying to get to a different place"*, which occurred in 318 (77%) of respondents, *"pacing and aimless wandering"* that occurred in 268 (65%) of respondents, and *"performing repetitive mannerisms"* that occurred in 231 (56%) of respondents. On the contrary, those that occurred the least were symptoms such as making verbal sexual advances, making physical sexual advances and intentional falls – in 4 to 5 (1%) of respondents.

The relationship between sex and the prevalence of behavioral symptoms

We assumed that there are differences in behavioral symptoms between men and women. We used Mann–Whitney *U* test. According to the Mann–Whitney *U* test, the difference in behavioral symptoms between males and females is not statistically significant (Sig. > 0.05). On the basis of the values of the average order, although in men the behavioral symptoms are higher, this difference is only random, so it does not reach the acceptable value of statistical significance (Table 2).

Table 2. Gender and behavioral symptoms

Gender, sex	No.	Average rank	The sum of rank
woman	278	49.24	3,186
man	135	54.76	1,805
summary	413		
	Behavioral symptoms		
Mann–Whitney *U* test		968	
Z		–0.932	
Sig.		0.273	

The relationship between gender and behavioral symptoms (aggressive behavior)

We assumed that there is a difference between behavioral symptoms (aggressive behavior) between men and women. According to the Mann–Whitney *U* test result (Table 3), there is a statistically significant difference in the manifestations of aggressive behavior between men and women (Sig. < 0.05) with Alzheimer's dementia. Considering the average ranking, we find higher aggressive behavior among men.

Table 3. Gender and behavioral symptoms (aggressive behavior)

	Gender	*N*	Average rank
Aggressive behavior	woman	278	45.62
	man	135	57.18
	summary	413	
	Aggressive behavior		
Mann–Whitney U test		867.4	
Z		3,094.6	
Sig.		0.038	

The relationship between gender and behavioral symptoms (physically nonaggressive behavior)

We assumed that there is a difference between the manifestations of physically non-aggressive behavior between men and women. According to the Mann–Whitney *U* test result (Table 4), there is no statistically significant difference in the manifestations of physically non-aggressive behavior between men and women (Sig. < 0.05) with Alzheimer's dementia. Considering the average ranking, we note that men reached higher scores in comparison to women, for physically non-aggressive behaviour.

Table 4. Gender and a behavioral symptoms(physically nonaggressive behavior)

	Gender	*N*	Average rank
Physically non-aggressive behavior	woman	278	45.23
	man	135	57.46
	summary	413	
	Physically non-aggressive behavior		
Mann–Whitney U test		836.4	
Z		3,104.5	
Sig.		0.098	

Relationship between sex and behavioral symptoms (verbally disturbing behavior)

We assumed that there is a difference between the verbal and unsettling behavior of men and women. According to the Mann–Whitney *U* test result (Table 5), there is no statistically significant difference in verbal disturbed behaviors between men and women (Sig. < 0.05) with Alzheimer's dementia. Considering the average ranking, we note that higher verbal restlessness (disturbed) behavior occurs in women.

Table 5. Gender and behavioral symptoms (verbal restless behavior)

	Gender	*N*	Average rank
Verbal restless behavior	woman	278	54.17
	man	135	44.73
	summary	413	
	Verbal restless behavior		
Mann–Whitney U test		916.5	
Z		1,424.5	
Sig.		0.220	

Discussion

In our research, we focused on behavioral symmetries of problem behavior in patients with Alzheimer's dementia. Loi and Lautenschlager (2017) report that behavioral symptoms are very common and are present in 90% of patients in a health care facility. As reported by Cohen-Mansfield (2004), up to 80–90% of patients develop at least one symptom of problem behavior during the course of the disease. Benoit et al. (2003) reported in their research study that the incidence of problem behavior in their research sample was 92.5% of the patients. In their study,Chiu et al. (2006) found that manifestations of problem behavior were observed in 90% of patients with Alzheimer's dementia. Davison et al. (2017) report that the medical staff in their research study reported 59 behavioral

symptoms with physically agitated, aggressive, verbal aggressive and nonaggressive manifestations, inappropriate social and sexual behavior, followed by problematic care. Mulders et al. (2016) report the occurrence of one or more manifestations of problem behavior in 90% of patients in the health care facility, 88% of patients experienced agitation, and 56% of patients had apathy.

Physically aggressive behavior, physically non-aggressive behavior and apathy occurred in patients with severe cognitive deficits, while verbal manifestations of problem behavior were common in all patients. Preuss et al. (2016) report that patients with Alzheimer's dementia develop at least one of the manifestations of problem behavior during the illness that affects the patient's life. Zuidema et al. (2010) reported in their research sample that symptoms of problem behavior occurred in 80% of patients with cognitive impairment. In our research sample, at least one symptom of problem behavior occurred in 92% of patients, which is identical to the study of Benoit et al. (2003). None of the symptoms of problem behavior occurred in 8% of patients. In their research, Senanarong et al. (2004) show that manifestations of problem behavior such as general restlessness,complaining, repetitive sentences or questions, negativism and verbal aggression occurred in 24–48% of patients. These results are also close to our findings.

Aimless wandering occured in 25% of patients, which is less than in our research sample. In our research sample, no more than 65% of the patients experienced pacing and aimless wandering. Borroni et al. (2008) examined the incidence of general restlessness in patients with Alzheimer's dementia, which occurred in 55.4% of patients, and worsened during the disease. Zuidema et al. (2010) reported general a restlessness incidence from 42% to 82% in their patient sample.

In our research, we were faced with a difference in the manifestations of problem behavior amongst the sexes, as one of the risk factors for the development of Alzheimer's dementia is also gender. Since the disease is predominantly more prevalent in women than in men, we assumed the difference in the manifestations of problem behavior. Based on the valuesof the average, the problem behavior is higher in men, but this difference is only random, it does not reach the acceptable value of statistical significance. Our assumption has not been confirmed. In our research sample, there are no differences in the problem of behavioral manifestations of gender. Mulders et al. (2016) report that there was no difference in the incidence of manifestations of problem behavior between the sexes in their research group.

Cohen-Mansfield et al. (1989) report that aggression is a common symptom in a patient with Alzheimer's dementia. Aggressiveness includes verbal (singing) and nonverbal expressions of aggression. Physical aggressiveness occurs most often in the home environment and is the main cause of patient placement in a health care facility. In medical facilities, verbal, physical and sexual aggressiveness is most common. In their study, Cohen-Mansfield and Werner (1998a) pointed out the possible relationship between cognitive functions and aggressiveness. They found that the increased incidence of verbal and physically aggressive behavior significantly correlated with low levels of cognitive functions. In another research study, Cohen-Mansfield and Werner (1998b) pointed out that cognitive impairment along with poor quality of relationships is the main predictor of physical aggression in Alzheimer's dementia patients. Similar research was conducted by Ryden (1998), which also points to the relationship between cognitive impairment and aggressiveness in patients with dementia. Bidzan et al. (2012) report that there is a relationship between functional disorders of cognitive function and intensification of aggressive manifestations in a patient with Alzheimer's dementia.

More serious forms of illness are associated with greater intensity of aggressive behavior. Pasqualetti et al. (2015) report that up to 70% of patients with Alzheimer's dementia have agitated or aggressive behavior. Agitation refers to emotional distress, excessive psychomotor activity, disturbing irritability and disinhibition, which may include aggressive behavior. Agitation may occur without aggression, for example, in performing repetitive mannerisms (Panza et al., 2015). Zuidema et al. (2010) conducted a large-scale research study that compared, among other things, gender-related behavioral problems. In men, physically aggressive behavior and female verbal restless behavior have been confirmed. The average prevalence of physically aggressive behavior ranged from 15% to 89%. The incidence of gender differences in physically nonaggressive manifestations of problem behavior has not been confirmed, as has been confirmed in our research. Brodaty et al. (2001) and Schreiner (2001) report that physically nonaggressive behaviors in Alzheimer's dementia patients are more common in men. In our research, the relationship between sex and physically non-aggressive behavior was not confirmed, but according to the average rank, the occurrence is higher in males than in women. Sourial et al. (2001) reported that 95% of patients in the study had at least one symptom of verbally disturbed behavior.In their study, Cohen-Mansfield and Libin (2005) found that verbal restless behavior is bound to female gender, which has not been statistically confirmed in our research sample, but there is a higher incidence in women than in men. In their study, Zuidema et al. (2010) stated that there was not a significant difference between gender and verbally disturbed behaviors, as has been confirmed in our research sample.

Conclusions

Alzheimer's dementia is one of the most difficult diagnoses in terms of nursing care in a geriatric patient. A cognitive disorder occurs in the patient and becomes dependent on another person. Behavioral symptoms (behavioral problems) that we have devoted our research to are major problems of nursing care and are the main cause of institutionalization and increased costs. The issue of behavioral symptoms and manifestations of problem behavior in patients with Alzheimer's dementia is highly relevant. It is proven that up to 80–90% of patients develop at least one of the behavioral symptoms during the course of the disease. In our research sample, at least one symptom occurred in 92% of patients. The influence of gender on prevalence has not been explicitly confirmed, but the differences in prevalence have been. However, the prevalence of problem behavior is high and is a major problem not only for the patient but also for the nursing staff as it affects the quality of life of the patient, the economy of the healthcare facility, and also affects the workload of the nursing staff. Behavioral symptoms are always socially inappropriate and can be manifested in three ways: aggression towards themselves and others, inappropriate verbal expressions, and inappropriate behaviors in accordance with social standards for a particular situation.In order to improve the management of problem behavior in Alzheimer's dementia patients, we recommend: rigorously conducting documentation with regard to problem behavior, implementing the Cohen-Mansfield Agitation Inventory (CMAI) in the health documentation, paying attention to

the problem behavior, and identifying the factors causing the problem behavior (especially environmental factors). Based on the results of the analysis of problem behavior behaviors according to the assessment scale, we recommend focusing on patient safety. The most common behavioral symptom istrying to get to a different place. It is important to provide a medical facility so that the patient does not get out of the premises, lock rooms (entrance to the building, escape routes, cleaning room, ambulance, technical room), inform health personnel about how to respond when the patient is out of the facility photo available, call the police, relatives, ...) and fill in the full-day program for the patient to be supervised. Increased attention should be paid to all manifestations of problem behavior in a patient with Alzheimer's dementia. Health personnel should be able to cope with any manifestation of problem behavior, as staff access and responses can also reduce or increase the incidence of problem behavior.

Limitations

We see the limitations of our research in an unevenly distributed set of respondents. Therefore, its results cannot be generalized to the entire population of Alzheimer's dementia patients in specialized facilities. In addition, it should be noted that there are few specialized facilities in Slovakia that provide specialized care to patients with Alzheimer's dementia, thus prolonging the time to obtain the necessary data.

Conflict of interests

The authors declare that the study has no conflict of interests.

Ethical aspects

Ethical aspects have been respected and theresearch has been approved by the facility management and ethics committee.

Vplyv pohlavia na prevalenciu behaviorálnych symptómov u pacientov s Alzheimerovou demenciou

Súhrn

Úvod: Prevalencia behaviorálnych symptómov u pacienta s Alzheimerovou demenciou je jeden z faktorov, ktorý výrazne ovplyvňuje ošetrovateľskú starostlivosť, predstavuje veľké problémy ošetrovateľskej starostlivosti a je hlavnou príčinou inštitucionalizácie a zvýšených nákladov.

Design: Pre tento výskum bol zvolený dizajn prospektívnej kvantitatívnej štúdie vykonanej na základe posudzovacej škály.

Cieľ: Cieľom výskumu bolo zmapovať prevalenciu behaviorálnych symptómov, prejavov problémového správania u pacientov s Alzheimerovou demenciou a zistiť vplyv pohlavia na jednotlivé prejavy.

Metodika: Na posúdenie behaviorálnych symptómov, problémového správania pacientov s Alzheimerovou demenciou sme použili posudzovaciu škálu Cohen-Mansfield Agitation Inventory (CMAI) a výsledky sme štatisticky spracovali pomocou Mann–Whitney *U* testu. Výskumnú vzorku tvorilo 413 pacientov, ktorí boli do vzorky zaradení na základe zámerného výberu.

Výsledky: Pomocou škály bol zistený výskyt behaviorálnych symptómov, problémového správania až u 92 % pacientov, u mužov je skóre (54) problémového správania vyššie ako u žien (49), avšak tento rozdiel je iba náhodný a nedosahuje hodnotu štatistickej významnosti (p = 0,273). V súvislosti s agresívnym správaním, konštatujeme, že je štatisticky významný rozdiel (p = 0,038) v prejavoch agresívneho správania medzi mužmi a ženami. V prejavoch fyzicky neagresívneho správania (p = 0,098) a v prejavoch verbálne nepokojného správania (p = 0,220) medzi mužmi a ženami nie je štatisticky významný rozdiel.

Záver: Problematika prevalencie behaviorálnych symptómov, problémového správania u pacientov s Alzheimerovou demenciou je vysoko aktuálna. Na záver môžeme konštatovať, že pohlavie nemá jednoznačný vplyv na prejavy behaviorálnych symptómov, problémového správania u pacientov s Alzheimerovou demenciou.

Kľúčové slová: Alzheimerova demencia; behaviorálne symptómy; senior; ošetrovateľská starostlivosť; problémové správanie

References

1. Apostolova LG, Di LJ, Duffy EL, Brook J, Elashoff D, Tseng CH, et al. (2014). Risk factors for behavioral abnormalities in mild cognitive impairment and mild Alzheimer's disease. Dement Geriatric Cogn Disord 37(5–)6: 315–326. DOI: 10.1159/000351009.
2. Benoit M, Staccini P, Brocker P, Benhamidat T, Bertogliati C, Lechowski L, et al. (2003). Behavioral and psychologic symptoms in Alzheimer's disease: results of the REAL. FR study. Rev Med Interne 24(Suppl. 3): 319s–324s. DOI: 10.1016/S0248-8663(03)80690-2.
3. Bidzan L, Bidzan M, Pąchalska M (2012). Aggressive and impulsive behavior in Alzheimer's disease and progression of dementia. Medical Sci Monit 18(3): CR182–189. DOI: 10.12659/MSM.882523.
4. Borroni B, Agosti C, Padovani A (2008). Behavioral and psychological symptoms in dementia with Lewy-bodies (DLB): frequency and relationship with disease severity and motor impairment. Arch Gerontol Geriatr 46(1): 101–106. DOI: 10.1016/j.archger.2007.03.003.
5. Brodaty H, Draper B, Saab D, Low LF, Richards V, Paton H, Lie D (2001). Psychosis, depression and behavioural disturbances in Sydney nursing home residents: prevalence and predictors. I J Geriatr Psychiatry 16(5): 504–512. DOI: 10.1002/gps.382.
6. Cohen-Mansfield J (2004). Nonpharmacologic interventions for inappropriate behaviors in dementia: a review, summary, and critique. Focus 9(2): 361–308.
7. Cohen-Mansfield J, Libin A (2005). Verbal and physical non-aggressive agitated behaviors in elderly persons with dementia: robustness of syndromes. J Psychiatr Res 39(3): 325–332. DOI: 10.1016/j.jpsychires.2004.08.009.
8. Cohen-Mansfield J, Werner P (1998a). Longitudinal changes in behavioral problems in old age: a study in an adult day care population. J Gerontol A Biol Sci Med Sci 53(1): M65–M71.
9. Cohen-Mansfield J, Werner P (1998b). Predictors of aggressive behaviors: a longitudinal study in senior day care centers. J Gerontol B Psychol Sci Soc Sci 53(5): P300–P310.
10. Cohen-Mansfield J, Marx MS, Rosenthal AS (1989). A description of agitation in a nursing home. J Gerontol 44(3): M77–M84.
11. Davison TE, McCabe MP, Bird M, Mellor D, MacPherson, Hallford D, et al. (2017). Behavioral symptoms of dementia

that present management difficulties in nursing homes: staff perceptions and their concordance with informant scales. J Gerontol Nurs 43(1): 34–43. DOI: 10.3928/00989134-20160928-01.

12. Dlugošová A, Tkáčová Ľ (2010). Komplexní ošetrovatelská péče o pacienta s demencí. Sestra 12: 50–51.
13. Donnelly ML (2005). Behavioral and psychological disturbances in Alzheimer disease: Assessment and treatment. BCMJ 47(9): 487–493.
14. Dorey JM, Beauchet O, Thomas Antérion C, Rouch I, Krolak-Salmon P, Gaucher J, et al. (2008). Behavioral and psychological symptoms of dementia and bipolar spectrum disorders: review of the evidence of a relationship and treatment implications. CNS Spectr13(9): 796–803. DOI: 10.1017/S1092852900013924.
15. Fiest KM, Roberts JI, Maxwell CJ, Hogan DB, Smith EE, Frolkis A, et al. (2016). The prevalence and incidence of dementia due to Alzheimer's disease: a systematic review and meta-analysis. Can J Neurol Sci 43: S1: S51–S82. DOI: 10.1017/cjn.2016.36.
16. Hall GR (1994). Caring for people with Alzheimer's disease using the conceptual model of progressively lowered stress threshold in the clinical setting. Nurs Clin North Am 29(1) 129–141.
17. Hersch EC, Falzgraf S (2007). Management of the behavioral and psychological symptoms of dementia. Clin Interv Aging2(4): 611–621.
18. Chiu MJ, Chen TF, Yip PK, Hua MS, Tang LY (2006). Behavioral and psychologic symptoms in different types of dementia. J Formos Med Assoc 105(7): 556–562. DOI: 10.1016/S0929-6646(09)60150-9.
19. Kučerová H (2006). Demence v kazuistikách. Praha: Grada.
20. Li X-L,.Hu N, Tan M-S, Yu J-T, Tan L (2014). Behavioral and psychological symptoms in Alzheimer's disease. Biomed Res Int 2014: 927804. DOI: 10.1155/2014/927804.
21. Livingston G, Sommerlad A, Orgeta V, Costafreda SG, Huntley Y, Ames D, et al. (2017). Dementia prevention, intervention, and care. The Lancet 390(10113): 2673–2734. DOI: 10.1016/S0140-6736(17)31363-6.
22. Loi SM, Lautenschlager NT (2017). Investigating the current methods of assessing behavioral and psychological symptoms in residential aged care facilities in a metropolitan city. Int Psychogeriatrics 29(5): 855–858. DOI: 10.1017/S104161021600226X.
23. Lyketsos CG., Steinberg M, Tschanz JT., Norton MC, Steffens DC, Breitner JC (2000). Mental and behavioral disturbances in dementia: Findings from the Cache County Study on Memory in Aging.Am J Psychiatry157(5): 708–714. DOI: 10.1176/appi.ajp.157.5.708.
24. Madhusoodanan S, Ting MB (2014). Pharmacological management of behavioral symptoms associated with dementia. World J Psychiatry (4)4: 72–79. DOI: 10.5498/wjp.v4.i4.72.
25. Miech RA, Breitner CS, Zandi PP, Khachaturian AS, Antony JC, Mayer L (2002). Incidence of AD may decline in the early 90s for men, later for women. Neurology 58(2): 209–218. DOI: 10.1212/WNL.58.2.209.
26. Mulders AJ, Fick IW, Bor H, Verhey FR, Zuidema SU, Koopmans RT (2016). Prevalence and correlates of neuropsychiatric symptoms in nursing home patients with young-onset dementia: The Beyond Study. J Am Med Dir Assoc 17(6): 495–500. DOI: 10.1016/j.jamda.2016.01.002.
27. Neil W, Bowie P (2008). Carer burden in dementia – assessing the impact of behavioural and psychological symptoms via self-report questionnaire. Int J Geriatr Psychiatry 23(1): 60–64. DOI: 10.1002/gps.1839.
28. Panza F, Solfrizzi V, Seripa D, Imbimbo BP, Santamato A, Lozupone M, et al. (2015). Progresses in treating agitation: a major clinical challenge in Alzheimer's disease. Expert Opin Pharmacother 16(17): 2581–2588. DOI: 10.1517/14656566.2015.1092520.
29. Pasqualetti G, Tognini S, Calsolaro V, Polini A, Monzani F (2015). Potential drug–drug interactions in Alzheimer patients with behavioral symptoms. Clin Interv Aging 10: 1457–1466. DOI: 10.2147/CIA.S87466.
30. Preuss UW, Wong JW, Koller G (2016). Treatment of behavioral and psychological symptoms of dementia: a systematic review. Psychiatr Pol 50(4): 679–715. DOI: 10.12740/PP/64477.
31. Ryden MB (1998). Aggressive behavior in persons with dementia who live in the community. Alzheimer Dis Assoc Disord 2(4): 342–355.
32. Senanarong V, Cummings JL, Fairbanks L, Mega M, Masterman DM, O'Connor SM, Strickland TL (2004). Agitation in Alzheimer's disease is a manifestation offrontal lobe dysfunction. Dementia and geriatric cognitive disorders 17(1–2): 14–20. DOI: 10.1159/000074080.
33. Schreiner AS (2001). Aggressive behaviors among demented nursing home residents in Japan. Int J Geriatr Psychiatry 16(2): 209–215.
34. Sourial R, McCusker J, Cole M, Abrahamowicz M (2001). Agitation in demented patients in an acute care hospital: prevalence, disruptiveness, and staff burden. Int Psychogeriatr 13(2): 183–197. DOI: 10.1017/S1041610201007578.
35. Zuidema SU, de Jonghe JF, Verhey FR, Koopmans RT (2010). Environmental correlates of neuropsychiatric symptoms in nursing home patients with dementia. Int J Geriatr Psychiatry 25(1): 14–22. DOI: 10.1002/gps.2292.