

Cognitive Disorders in People over 65 in Home Environment

Występowanie zaburzeń poznawczych u osób po 65. roku życia w środowisku domowym

Małgorzata Dziechciaż¹, Jarosław Chmielewski²

¹ Health Care Institute, State School of Higher Vocational and Economic Education in Jarosław, Poland

² Institute of Environmental Protection — National Research Institute in Warsaw, Poland

Abstract

Introduction. Cognitive disorders are a serious problem in the elderly that lead to the loss of functional ability and thus dependence on others.

Aim. The aim of the article is to assess the cognitive disorders in people over 65 in home environment and show a correlation between age, sex, education, multiple morbidities, functional disability, and cognitive disorders.

Material and Methods. The research was carried out using diagnostic survey and direct observation. Also, the following research tools were used: Abbreviated Mental Test Score (AMTS), Barthel Scale, Lawton Scale and own survey questionnaire. The research was carried out on 329 women and 175 men, aged 66–94.

Results. 74.80% of the surveyed were found to have normal cognitive ability. Mild cognitive disability was found in 20.24% of the respondents, and severe — in 4.96%. It has been concluded that women with low level of education, more morbidities, and sight and hearing impairment had worse cognitive ability ($p < 0.001$). Moreover, it has been concluded that cognitive ability of the surveyed was worsening with age in a significant way ($p < 0.001$).

Conclusions. Cognitive disorders affected 25.20% of people over 65 in home environment. Furthermore, relevant factors that influenced the incidence of cognitive disorders in the elderly over 65 years old in home environment were: female sex, elderly age, low level of education and multiple morbidities. Moreover, cognitive disorders occurring in people over 65 in the home environment significantly contributed to the deterioration of their functional efficiency. (JNPN 2021;10(2):65–70)

Key Words: cognitive disorders, elderly, home environment

Streszczenie

Wstęp. Zaburzenia poznawcze stanowią bardzo poważny problem osób w podeszłym wieku przyczyniają się do utraty sprawności funkcjonalnej i prowadzą do zależności od innych.

Cel. Celem pracy była ocena występowania zaburzeń poznawczych u osób po 65. roku życia w środowisku domowym oraz wykazanie zależności pomiędzy wiekiem, płcią, wykształceniem, wielochorobowością i niesprawnością funkcjonalną a zaburzeniami poznawczymi.

Materiał i metody. Badania przeprowadzono metodą sondażu diagnostycznego i obserwacji bezpośredniej. Zastosowano narzędzia badawcze takie jak: Skrócony Test Sprawności Umysłowej (AMTS), Skala Barthel, Skala Lawtona oraz autorski kwestionariusz wywiadu. Badaniami objęto 329 kobiet, 175 mężczyzn w wieku od 66 do 94 lat.

Wyniki. U 74,80% badanych osób stwierdzono prawidłową sprawność poznawczą. Umiarkowane upośledzenie poznawcze stwierdzono u 20,24% respondentów, a ciężkie u 4,96% badanych. Stwierdzono, że kobiety, osoby z niskim poziomem wykształcenia oraz z większą ilością chorób, z upośledzeniem wzroku i słuchu posiadały gorszy stan poznawczy ($p < 0,001$). Ponadto wykazano, że sprawność poznawcza badanych osób w sposób istotny ($p < 0,001$) pogarszała się wraz z wiekiem badanych.

Wnioski. Zaburzenia poznawcze występowały u 25,20% badanych osób po 65. roku życia w środowisku domowym. Ponadto, istotnymi czynnikami wpływającymi na występowanie zaburzeń poznawczych u osób po 65. roku życia w środowisku domowym były: płeć żeńska, starszy wiek, niski poziom wykształcenia oraz wielochorobowość.

Co więcej, zaburzenia poznawcze występujące u osób po 65. roku życia w środowisku domowym znacząco wpływały na pogorszenie ich sprawności funkcjonalnej. (PNN 2021;10(2):65–70)

Słowa kluczowe: zaburzenia poznawcze, osoby w podeszłym wieku, środowisko domowe

Introduction

Cognitive disorders are a serious problem in the elderly that lead to the loss of functional ability and thus dependence on others.

Cognitive disorders are triggered by both physiological changes which occur in CNS with ageing and different types of conditions. Despite many research it is difficult to differentiate cognitive disorders that result from the ageing from those that result from a disease process in CNS [1]. It is believed that cognitive disorders that resulted from physiological changes in the nervous system don't get worse and nor develop, and above all they don't significantly affect cognitive ability. The deepening and development of cognitive disabilities can be a sign on an ongoing dementia process [2,3]. Research by many authors have shown that people who were diagnosed with mild cognitive disorder had a high risk of dementia [4].

The statistical data shows that dementia affects 30 million people in the world. It is estimated that until 2030 this number will reach 60 million, and in 2050 — 114 million [5]. Dementia affects 3–11% of people over 65 and 20–50% people aged 80–85. In Poland there are 500 thousand people suffering from dementia. Dementia significantly deteriorates the quality of life of the elderly, decreases their independence and leads to a higher death risk due to the coexisting morbidities [6–9].

An early diagnosis of cognitive disorders in the elderly allows a timely implementation of prophylaxis and treatment, what has a significant influence of the clinical process and prognosis [4].

The aim of the article is to assess the cognitive disorders in people over 65 in home environment and show a correlation between age, sex, education, multiple morbidities, functional disability, and cognitive disorders.

Material and Methods

The research was carried out using diagnostic survey and direct observation. A direct interview method was also used. An own questionnaire was applied to assess demographic and health data of the surveyed. The questionnaire included such information as: age, sex, education and living conditions. Health assessment included such factors as chronic diseases, and sight and hearing functionality.

Also, the following standardised tools have been used:

1. Abbreviated Mental Test Score AMTS — used as a screening test of intellectual performance. It assesses the ability to associate facts, short and long memory, and abstract thinking. It includes questions and tasks. Each correct answer counts as one point, an incorrect one as 0. Its maximum score is 10 points, and the minimum 0. The lower the score, the worse the mental ability. The score over 6 points indicates normal cognitive condition, between 6 and 4 — mild disorder, and between 11 and 4 — severe disorder [10–11].
2. Barthel Scale is used to assess functional independence in basic activities of daily living. Its maximum score is 0–100 points. A lower score indicates more disability in basic activities in daily living and more dependence on others [11–12].
3. Lawton Scale (Instrumental Activities of Daily Living — IADL) — used to assess functional independence in complex activities of daily living. The lowest IADL score is 8 points, which means a complete lack of independence in the activities of daily living. The maximum score is 24 points, which shows independence in complex activities of daily living. The lower the IADL score the more severe dependence in terms of the complex activities of daily living [13–14].

The research was conducted on 504 respondents in their home environment, residents of Podkarpackie voivodeship. If the AMTS test showed mild or severe cognitive disability, the information was verified with the caretakers.

To assess the dependence between selected variables the following statistical tests have been used:

1. Kendall's tau test — only one sign related to this statistical measure was used in the description τ (tau) — the value of Kendall tau correlation coefficient.
2. Kolmogorov–Smirnov test.
3. Pearson's chi-squared test (χ^2) — one variable related to this test was used χ^2 — chi-squared test value if expected numbers were lower than 5, Yates amendment was used.
4. Kruskal–Wallis test — one variable related to this test was used H — Kruskal–Wallis test value.
5. Dunn Post hoc test — recommended for post hoc analyses of Kruskal–Wallis test.

Moreover, the following statistical values have been used: N — number of people in a group, n — number of people in a subgroup, p — significance level.

The significance level was set as $p < 0.05$. Statistical calculations have been made using STATISTICA 6.0 PL. Consent of Bioethical Commission of IMW in Lublin No. 25/2013.

Results

The research was carried out on 504 people (women — 329, 65.28%; men — 175, 34.72%) aged 66–94. The mean age of the surveyed was 77.41 years old (SD=6.60; Me=78). The mean age of women was higher (78.05 years old; SD=6.50; Me=78) than men (76.19 years; SD=6.65; Me=76).

The most numerous group was made up of married people (n=259; 51.39%). There were 233 (46.23%) widows and widowers, 9 (1.79%) single people, 2 (0.40%) divorced and one (0.20%) separated.

The majority of the surveyed has lower incomplete education (n=260; 51.59%); 161 (31.94%) respondents had basic education, and 65 (12.90%) vocational education. Only 14 (2.78%) respondents had middle education, and 4 (0.79%) higher.

Furthermore 142 (28.17%) of the surveyed described their living conditions as ‘very good’, and 234 (46.43%) as ‘good’. 119 (23.61%) of the respondents assessed their living conditions as ‘average’, and 9 (1.79%) as ‘bad’.

The highest AMTS score was 10 (n=133), and the lowest 0 (n=12) (Figure 1). The arithmetic mean of the points scored in the whole group was 7.68 (SD=2.28; Me=8).

The majority of the surveyed (74.80%) were found to have normal cognitive ability (7–10 AMTS points). Mild cognitive disability (4–6) was found in 20.24% of the respondents, and severe (0–3) — in 4.96%.

The comparison between men and women in AMTS scores showed that women scored less than men (mean score 7.39 and 8.24 respectively) ($p < 0.001$), what suggests worse cognitive condition in women.

suggests worse cognitive condition in women.

However, it has been concluded that women suffered from mild cognitive disorder significantly more often ($p < 0.001$), and had normal cognitive condition less often ($p < 0.01$) (Figure 2).

Kendall’s Tau test has shown a negative correlation between the age of the participants and their AMTS scores ($\tau = -0.4083$; $p < 0.001$). The older the surveyed the worse their cognitive ability.

The highest mean score (8.38) in AMTS showing good cognitive ability was achieved by married respondents. A slightly lower score (6.97) was achieved by widows and widowers, and single people (5.67). Observed differences were statistically significant ($p < 0.01$).

According to Kendall Tau test there was a correlation between a higher level of education and better AMTS scores ($\tau = 0.3816$; $p < 0.001$).

According to Kruskal–Wallis test and Dunn test, the better the surveyed assesses their living conditions the higher they scored in AMTS test — the results were rising from the mean 5.22 (‘bad’), through 7.09 (‘average’), 7.60 (‘good’) until 8.46 (‘very good’). All differences were statistically significant ($p < 0.01$).

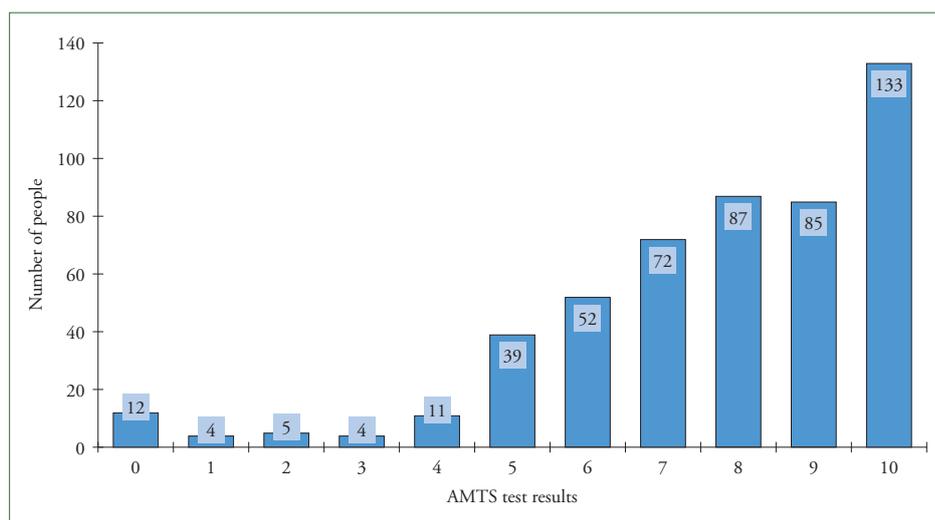


Figure 1. Cognitive performance assessment results using the AMTS test

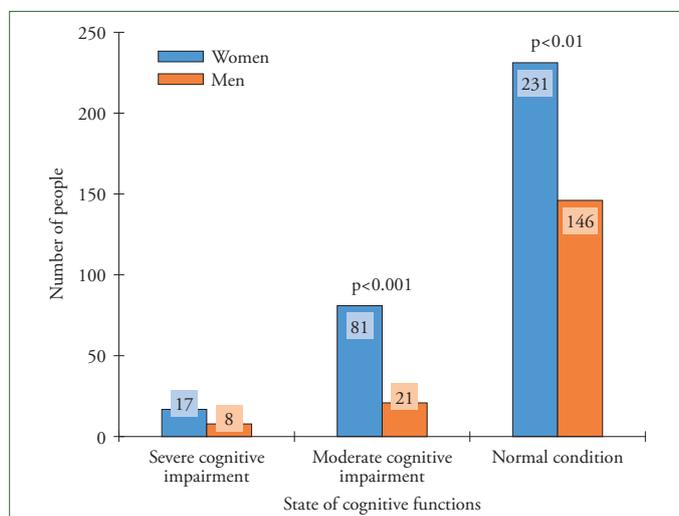


Figure 2. Gender and cognitive performance of the respondents

Kendall's Tau test has shown an inverse proportion between the number of comorbidities and AMTS test scores ($\tau=-0.1748$; $p<0.001$).

It was shown that the subjects after stroke and those suffering from atherosclerosis or Alzheimer's disease were characterized by worse cognitive functioning than the respondents who did not suffer from the above-mentioned diseases ($p<0.001$). No relationship was found between the occurrence of other diseases and the cognitive performance of the respondents (Table 1).

cognitive disorders are said to be sight and hearing impairments and various types of somatic diseases [9].

In the presented research the cognitive disorders affected almost 1/4 of the surveyed elderly, in 20.24% of them the disorder was mild and in 4.96% — severe. It has been shown that there is a statistically significant correlation between the age and sex of the respondents and their cognitive disorders. Cognitive disorders progressed with age and affected women more often.

Table 1. Occurring disease and the test results of AMTS

| No. | Disease entity | People diagnosed with the disease | | | People without the disease | | | p-level |
|-----|------------------------|-----------------------------------|-------------|------|----------------------------|-------------|------|---------|
| | | n | \bar{x}^* | SD | n | \bar{x}^* | SD | |
| 1 | Hypertension | 391 | 7.85 | 2.00 | 113 | 7.11 | 3.00 | >0.10 |
| 2 | Circulatory failure | 217 | 7.37 | 2.32 | 287 | 7.92 | 2.23 | <0.10 |
| 3 | Stroke | 46 | 5.91 | 3.26 | 458 | 7.86 | 2.08 | <0.001 |
| 4 | Atherosclerosis | 146 | 6.64 | 2.63 | 358 | 8.11 | 1.97 | <0.001 |
| 5 | Bronchial asthma | 41 | 7.39 | 2.41 | 463 | 7.71 | 2.27 | >0.10 |
| 6 | Diabetes | 114 | 7.48 | 1.97 | 390 | 7.74 | 2.36 | >0.10 |
| 7 | Osteoarthritis | 313 | 7.61 | 2.23 | 191 | 7.81 | 2.36 | >0.10 |
| 8 | Parkinson's disease | 9 | 7.33 | 1.87 | 495 | 7.69 | 2.29 | >0.10 |
| 9 | Alzheimer's disease | 6 | 1.17 | 1.47 | 498 | 7.76 | 2.17 | <0.001 |
| 10 | Tumors | 13 | 7.62 | 2.96 | 491 | 7.68 | 2.26 | >0.10 |
| 11 | Prostate hypertrophy** | 60 | 7.88 | 2.50 | 115 | 8.43 | 2.07 | >0.10 |
| 12 | Another | 118 | 7.64 | 2.27 | 386 | 7.70 | 2.29 | >0.10 |

* Arithmetic mean of the AMTS test results; ** Only the cases of men were analyzed

It has been shown that the respondents claiming to have no sight and hearing problems scored highest in AMTS test (8.39; 8.32 respectively), what shows they have a better cognitive ability than other surveyed ($p<0.001$).

Kendall Tau test analysis has also shown that there is a statistically relevant correlation between the cognitive ability of the surveyed and their independence in the basic ($\tau=0.4565$; $p<0.001$) and complex ($\tau=0.4912$; $p<0.001$) activities of the daily living. While the respondents' cognitive ability was deteriorating, their independence in basic and complex activities of the daily living was also worsening.

Discussion

Cognitive ability is an important aspect of the functioning of the elderly. According to the literature, cognitive disorders have a negative influence on the quality of life of the elderly and contribute to their institutionalisation [15]. The main factors that cause

Similar results were obtained in PolSenior research, in which the cognitive functions were assessed with MMSE test. Dementia was suspected in about 1/3 of the respondents. It has also been observed that age and female sex are strong factors of cognitive disorders [5].

According to Wojszel and Bień [16] who carried out Katzman's Cognitive Disorders Test on the residents of Sokolka Borough and an central district of the city of Białystok, cognitive disorder increases with age and occurs more often in women living in cities. Pniewska et al. [17] also have concluded that people over 65 have worse cognitive ability than younger people.

In this research the statistical analysis has shown that cognitive disability was related to sight and hearing impairments and a higher number of comorbidities in the surveyed. Moreover, it has been observed that people with a history of stroke, or suffering from atherosclerosis or Alzheimer Disease had worse cognitive ability. Melis et al. [18] in their research carried out in Stockholm among 418 people ages 78 and more have also drawn attention to a strong correlation between multimorbidity and cognitive disorders.

Many Polish and foreign researchers indicate a correlation between cognitive disorders and functional disability [19–21].

These observations are also confirmed by this research, in which it has been concluded that lower scores in Barthel and Lawton Scales, showing more dependence in basic and complex activities of the daily living, were obtained by the respondents with worse cognitive ability.

The analysis of this research and research by other authors has shown that cognitive disorders occur more often in people with lower level of education [5].

Conclusions

1. According to the research, cognitive disorders affected over one fourth of the surveyed aged over 65 in home environment.
2. Factors that influenced the incidence of cognitive disorders in the elderly over 65 years old in home environment were: female sex, elderly age, low level of education and multiple morbidities.
3. Cognitive disorder in people aged over 65 in home environment had considerably contributed to the deterioration of their functional ability.

Implications for Nursing Practice

Cognitive impairment is a serious problem leading to disability in the elderly. Thus, there is a need to introduce measures as early as possible to assess the cognitive functions of elderly people and identify disorders in this area. It is extremely important to include questions about cognitive functioning in the interview, as well as to use standardized research tools to assess cognitive functions, especially in advanced age patients with multiple diseases and after stroke. Early detection of cognitive disorders will allow for the early introduction of multidisciplinary therapeutic measures and thus increase the chances of older people with cognitive disorders for longer, independent functioning.

References

- [1] Straś-Romanowska M. Późna dorosłość. W: Trempała J. (Red.), *Psychologia rozwoju człowieka. Podręcznik akademicki*. PWN, Warszawa 2011;326–350.
- [2] Kotapka-Minc S. Znaczenie badania neuropsychologicznego w diagnostyce otępienia. *Pol Prz Neurolog.* 2007;3(2):61–68.
- [3] Bilikiewicz A., Matkowska-Białko D. Zaburzenia funkcji poznawczych a depresja. *Udar Mózgu.* 2004;6(1):27–37.
- [4] Gabryelewicz T. Łagodne zaburzenia poznawcze. *Post Nauk Med.* 2011;24(8):688–691.
- [5] Klich-Rączka A., Siuda J., Piotrowicz K. i wsp. Zaburzenia funkcji poznawczych u osób w starszym wieku. W: Mossakowska M., Więcek A., Błędowski P. (Red.), *Aspekty medyczne, psychologiczne, socjologiczne i ekonomiczne starzenia się ludzi w Polsce*. Termedia Wydawnictwo Medyczne, Poznań 2012;109–121.
- [6] Krzemieniecki K. Całościowa ocena geriatryczna i jej znaczenie kliniczne w onkologii — systematyczny przegląd piśmiennictwa. *Gerontol Pol.* 2009;17(1):1–6.
- [7] Contador I., Bermejo-Pareja F., Mitchell A.J. et al. Cause of death in mild cognitive impairment: a prospective study (NEDICES). *Eur J Neurol.* 2014;21(2):253–2e9.
- [8] Morrison R.S., Siu A.L. Survival in end-stage dementia following acute illness. *JAMA.* 2000;284(1):47–52.
- [9] Kostka T. Zaburzenia psychogeriatryczne (otępienie, depresja, delirium). W: Kostka T., Koziarska-Rościszewska M., *Choroby wieku podeszłego*. Wydawnictwo Lekarskie PZWL, Warszawa 2009;147–153.
- [10] Cytowicz-Karpiłowska W., Kazimierska B., Cytowicz A. *Postępowanie usprawniające w geriatryi. Podstawy, wskazania, przeciwwskazania*. Wyd. Almamater Wyższa Szkoła Ekonomiczna w Warszawie, Warszawa 2009.
- [11] Kostka T. Całościowa ocena geriatryczna. W: Kostka T., Koziarska-Rościszewska M., *Choroby wieku podeszłego*. Wydawnictwo Lekarskie PZWL, Warszawa 2009;17–37.
- [12] Borowicz A.M. Testy służące do oceny sprawności funkcjonalnej osób starszych. W: Wiczerowska-Tobis K., Kostka T., Borowicz A.M. (Red.), *Fizjoterapia w geriatryi*. Wydawnictwo Lekarskie PZWL, Warszawa 2011;45–60.
- [13] Kocemba J., Grodzki T. *Zarys gerontologii klinicznej*. Wyd. MCKP UJ, Kraków 2004.
- [14] Wiktor K., Drozdowska B., Czekajło A., Hebel R. Wybrane metody oceny czynnościowej (funkcjonalnej) w praktyce lekarskiej. *Ann Acad Med Siles.* 2010;64(5–6):76–81.
- [15] Rosenthal T. Przewlekłe zaburzenia pamięci. W: Rosenthal T., Naughton B., Williams M. (Red.), *Geriatrya*. Wyd. Czelej, Lublin 2009;291–313.
- [16] Wojszel B., Bień B. Rozpowszechnienie wielkich zespołów geriatrycznych w populacji osób w późnej starości — wyzwanie dla podstawowej opieki zdrowotnej. *Prz Lek.* 2002;59(4–5):216–221.
- [17] Pniewska J., Jaracz K., Górna K. Wpływ procesu starzenia się na funkcje poznawcze w populacji wiejskiej Wielkopolski. *Pielęgniarstwo Polskie.* 2011;1(39):7–10.
- [18] Melis R., Marengoni A., Angleman S., Fratiglioni L. Incidence and predictors of multimorbidity in the elderly: a population-based longitudinal study. *PLoS One.* 2014;9(7):e103120.
- [19] Cebulak M., Markiewicz I., Guty E. Ocena funkcji poznawczych u chorych objętych domową długoterminową opieką pielęgniarską. *Probl Pielęg.* 2014;22(1):20–26.
- [20] Białachowska A. Niesprawność funkcjonalna w umiarkowanym otępieniu w przebiegu choroby Alzheimera. *Geriatrya.* 2010;4:5–9.
- [21] Bigelow W., Becker M., Collins T. *Functional and cognitive change among elderly long term nursing facility residents*. Abstract Book Association Services Research Meeting 1999.

Corresponding Author:

Małgorzata Dziechciaż 

Health Care Institute,
State School of Higher Vocational
and Economic Education in Jarosław, Poland
Czarneckiego 16 street, 37-500 Jarosław, Poland
e-mail: dziechciaz@vp.pl

Conflict of Interest: None

Funding: None

Author Contributions: Małgorzata Dziechciaż^{A-1},
Jarosław Chmielewski^{G-1} 

A — Concept and design of research, B — Collection and/or compilation of data,
C — Analysis and interpretation of data, D — Statistical analysis, E — Writing
an article, F — Search of the literature, G — Critical article analysis, H — Approval
of the final version of the article, I — Acquisition of assets [eg financial]

Received: 26.02.2021

Accepted: 12.04.2021