

# Mental capacity of elderly people according to the AMTS as shown on the example of nursing home residents

## Sprawność umysłowa seniorów wg skali AMTS na przykładzie pacjentów zakładu pielęgnacyjno-opiekuńczego

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### Abstract

**Introduction.** The ageing process affecting the human body leads to the deterioration of people's physical, social, psychological and mental abilities. **Purpose of the study.** The purpose of the study was to determine the mental capacity of elderly people staying at a nursing home. **Material and methods.** 94 nursing home residents participated in the study, which was conducted in 2017 after the Bioethical Committee had granted their consent to it. The average age of the residents was 78, 98 being the most advanced age. The study was based on the diagnostic survey method; Hodgkinson's mental capacity test (Abbreviated Mental Test Score) was used. **Results.** 84% of the surveyed nursing home residents had some mental capacity impairment, 64.9% of whom suffered from severe mental capacity impairment. The following groups of people had the lowest levels of mental capacity among the surveyed nursing home residents: women, people with primary education, those aged over 75, city inhabitants and childless people (2.42 points, 2.19 points, 67.7%, 2.47 points, 1.62 points respectively). **Conclusions.** The majority of the nursing home residents suffered from mental capacity impairment; the more advanced the residents' age was, the more severe this condition became. (Gerontol Pol 2017; 25: 223-228)

**Key words:** elderly people, mental capacity, long-term nursing care

### Streszczenie

**Wstęp.** W procesie starzenia się organizmu ludzkiego dochodzi do pogorszenia sprawności fizycznej, socjalnej, psychicznej, w tym również umysłowej. **Cel.** Celem przeprowadzonego badania było określenie sprawności umysłowej seniorów przebywających w zakładzie pielęgnacyjno-opiekuńczym. **Materiał i metody.** Badaniem objęto w 2017 r., po uzyskaniu zgody Komisji Bioetycznej, 94 pacjentów zakładu pielęgnacyjno – opiekuńczego Średnia wieku seniorów wynosiła 78 lat, a wiek maksymalny-98 lat. Zastosowano metodę sondażu diagnostycznego, technikę ankietową z wykorzystaniem testu

sprawności umysłowej wg Hodgkinsona (AMTS). **Wyniki.** Upośledzenie sprawności umysłowej dotyczyło 84,0% badanych, w tym u 64,9% stwierdzono poważne upośledzenie. Niższy poziom sprawności umysłowej reprezentowały kobiety (2,42 punkty), osoby z wykształceniem podstawowym (2,19 punkty), po 75 roku życia (67,7%), mieszkańcy miasta (2,47 punkty) oraz bezdzietni (1,62 punkt). **Wnioski.** Upośledzenie sprawności umysłowej dotyczyło większości seniorów przebywających w zakładzie pielęgnacyjno-opiekuńczym, stan ten nasilał się wraz z wiekiem i dotyczył coraz większej grupy pacjentów. (*Gerontol Pol* 2017; 25: 223-228)

**Słowa kluczowe:** senior, sprawność umysłowa, opieka długoterminowa

## Introduction

With age, the physiological processes taking place in the respective systems of the human body lead to a number of changes in the life of elderly people, whose physical, psychological and social abilities gradually deteriorate. Their motor and postural system become impaired, and certain sense organ lesions appear. Elderly people gradually cease to be self-reliant [1,2].

Ageing also results in certain lesions in the central nervous system. Elderly people's metabolism slows down, their brain mass is reduced, neurotransmitter synthesis is disturbed. These changes lead to memory deterioration, diminished concentration and information-handling.

The impulse conduction in the central nervous system also slows down, which results in prolonged reflex response time. The sense organ lesions affect the senses of touch, smell, taste, hearing and sight [4].

## Purpose of the study

The purpose of the study was to determine the mental capacity of elderly people staying at a nursing home as a factor determining their functional ability.

## Material and methods

94 nursing home residents, 72 of whom were women, participated in the study. The average age of the residents was 78 (the women's and men's average age was 80 and 69 respectively), 98 being the most advanced age. The respondents were mainly people with vocational education (38.3%), primary education (34%) and secondary education (23.4%). Over three quarters of the respondents were city inhabitants (80.9%). The majority of them were widows and widowers (57.4%) who had children (77.7%). On average, they had been staying at the nursing home for 14.7 months, and had been visited by their family members more frequently than once a week (57.9%).

Obtaining the Bioethical Committee's consent was the fundamental prerequisite for the study (Resolution no. KB 369/2017 dated 16th May 2017). The study was ba-

sed on the diagnostic survey method; the authors' own questionnaire and Hodgkinson's mental capacity test (Abbreviated Mental Test Score) were used. Before the residents were surveyed, they had given their consent to the survey study.

The correlation of the variables was calculated by means of Spearman's rank correlation coefficient. The non-parametric Mann-Whitney U test was also used in order to assess one of the features between the two groups of people. The Statistica 10.0 program and Microsoft Excel spreadsheet were used to make all the calculations and figures.

## Results

Having answered the AMTS test questions, each respondent finished with a score ranging between 0 and 10 points. Their scores were interpreted as follows:

- > 6 points – normal mental capacity
- 4-6 points – mild mental capacity impairment
- 0-3 points – severe mental capacity impairment

The majority of the surveyed nursing home residents (64.9%) suffered from severe mental capacity impairment, while the minority of them (16.0%) had normal mental capacity.

The average mental capacity score was 2.65 points.

Among all the AMTS questions/items, the highest score was achieved in the following: (3) 'Please memorize and repeat the address which I am going to give you.' – average of 0.4 point; (6) 'When were you born?' – average of 0.37 point; and (1) 'How old are you?' – average of 0.36 point. The lowest score was obtained in the following: (7) 'When did the Second World War break out?' – average of 0.19 point; (9) 'Please count down from 20 to 1.' – average of 0.18 point; and (8) 'What is the name and surname of the President of Poland?' – average of 0.11 point.

The surveyed men had a higher average AMTS score (3.41 points) than the women (2.42 points).

No statistically significant differences were noted between the men and women in terms of the AMTS score ( $p > 0.05$ ).

**Table I. Average results of the mental capacity test**

No.	AMTS Question/Item	Average	SD	Confidence -95.0%	Confidence +95.0%
1	How old are you?	0.36	0.483	0.26	0.46
2	What time is it?	0.27	0.444	0.17	0.36
3	Repeating a given address.	0.40	0.493	0.30	0.51
4	What year is it?	0.26	0.438	0.17	0.35
5	What is your address?	0.31	0.464	0.21	0.40
6	When were you born?	0.37	0.486	0.27	0.47
7	When did the Second World War break out?	0.19	0.396	0.11	0.27
8	What is the name and surname of the President of Poland?	0.11	0.310	0.04	0.17
9	Please count down from 20 to 1.	0.18	0.387	0.10	0.26
10	Please repeat the address which I have given you.	0.20	0.404	0.12	0.28

**Table II. Average AMTS score – men and women**

Sex	AMTS Question/Item	Female		Male	
		Average	SD	Average	SD
	How old are you?	0.32	0.47	0.50	0.51
	What time is it?	0.24	0.43	0.36	0.49
	Please memorise and repeat the address which I am going to give you.	0.39	0.49	0.45	0.51
	What year is it?	0.21	0.41	0.41	0.50
	What is your address?	0.29	0.46	0.36	0.49
	When were you born?	0.36	0.48	0.41	0.50
	When did the Second World War break out?	0.18	0.39	0.23	0.43
	What is the name and surname of the President of Poland?	0.10	0.30	0.14	0.35
	Please count down from 20 to 1.	0.15	0.36	0.27	0.46
	Please repeat the address which I have given you.	0.18	0.39	0.27	0.46
	How old are you?	0.32	0.47	0.50	0.51
	What time is it?	0.24	0.43	0.36	0.49
	Total	2.42	3.23	3.41	3.53

**Table III. Average AMTS score in the education groups**

Education	AMTS Question/Item	Primary		Vocational		Secondary	
		Average	SD	Average	SD	Average	SD
	How old are you?	0.38	0.49	0.28	0.45	0.46	0.51
	What time is it?	0.22	0.42	0.22	0.42	0.38	0.50
	Please memorise and repeat the address which I am going to give you.	0.41	0.50	0.33	0.48	0.50	0.51
	What year is it?	0.22	0.42	0.19	0.40	0.38	0.50
	What is your address?	0.34	0.48	0.22	0.42	0.38	0.50
	When were you born?	0.41	0.50	0.28	0.45	0.46	0.51
	When did the Second World War break out?	0.09	0.30	0.19	0.40	0.31	0.47
	What is the name and surname of the President of Poland?	0.00	0.00	0.08	0.28	0.27	0.45
	Please count down from 20 to 1.	0.03	0.18	0.17	0.38	0.38	0.50
	Please repeat the address which I have given you.	0.09	0.30	0.25	0.44	0.27	0.45
	Total	2.19	2.51	2.22	3.00	3.81	4.29

**Table IV. Mental capacity according to the AMTS in the education groups**

Education	Primary		Vocational		Secondary	
	No.	%	No.	%	No.	%
Normal mental capacity	1	3.1	6	16.7	8	30.8
Mild mental capacity impairment	10	31.3	4	11.1	4	15.4
Severe mental capacity impairment	21	65.6	26	72.2	14	53.8
Total	32	100.0	36	100.0	26	100.0

**Table V. Average AMTS score – city and rural inhabitants**

Place of residence	Countryside		City	
	Average	SD	Average	SD
AMTS Question/Item				
How old are you?	0.56	0.51	0.32	0.47
What time is it?	0.28	0.46	0.26	0.44
Please memorise and repeat the address which I am going to give you.	0.50	0.51	0.38	0.49
What year is it?	0.50	0.51	0.20	0.40
What is your address?	0.33	0.49	0.30	0.46
When were you born?	0.50	0.51	0.34	0.48
When did the Second World War break out?	0.17	0.38	0.20	0.40
What is the name and surname of the President of Poland?	0.17	0.38	0.09	0.29
Please count down from 20 to 1.	0.22	0.43	0.17	0.38
Please repeat the address which I have given you.	0.17	0.38	0.21	0.41
Total	3.39	3.60	2.47	3.24

**Table VI. The respondents' mental capacity according to the AMTS – city and rural inhabitants**

Place of residence	Countryside		City	
	No.	%	No.	%
AMTS				
Normal mental capacity	3	16.7	12	15.8
Mild mental capacity impairment	6	33.3	12	15.8
Severe mental capacity impairment	9	50.0	52	68.4
Total	18	100.0	76	100.0

The men had a slightly better score than the women; 11 men (50.03%) and 50 women (69.4%) had severe mental capacity impairment.

The surveyed elderly people's education had no statistically significant correlation with the AMTS score ( $p > 0.05$ ). The highest average score was noted among the respondents with secondary education (3.81 points), and the lowest average score was noted among those with primary education (2.19 points).

The best results were achieved by the respondents with secondary education; 30.8% of them had normal mental capacity. The worst results were achieved by the respondents with primary education; only one person in this group had normal mental capacity (3.1%).

15.8% of the respondents aged 65-75 and 12.9% of those aged over 75 had normal mental capacity. 26.3% and 19.4% of them respectively had mild mental capacity impairment. 57.9% and 67.7% of them respectively had severe mental capacity impairment. The respondents aged over 75 had the worst results. The respondents'

age had no statistically significant correlation with the AMTS score ( $p > 0.05$ ).

The respondents living in the countryside had a higher average AMTS score (3.39 points), i.e. mild mental capacity impairment, compared to those living in cities (2.47 points), i.e. severe mental capacity impairment. The mental capacity of city and rural inhabitants did not differ in a statistically significant way ( $p > 0.05$ ).

The city inhabitants had better AMTS results than the rural inhabitants; 15.8% of the former and 16.7% of the latter had normal mental capacity.

Due to the significance level ( $p > 0.05$ ), no statistically significant differences were noted between those respondents who had children and the childless ones in terms of the AMTS.

81% of the childless respondents and 60.3% of those having children had severe mental capacity impairment. The average score for the latter was 2.95 points, and for the former – 1.62 points. 19.2% of the respondents with children had normal mental capacity.

**Table VII. Average AMTS score – having and not having children**

Having children	Yes		No	
	Average	SD	Average	SD
AMTS Questions/Items				
How old are you?	0.41	0.50	0.19	0.40
What time is it?	0.29	0.46	0.19	0.40
Please memorise and repeat the address which I am going to give you.	0.41	0.50	0.38	0.50
What year is it?	0.29	0.46	0.14	0.36
What is your address?	0.38	0.49	0.05	0.22
When were you born?	0.45	0.50	0.10	0.30
When did the Second World War break out?	0.23	0.43	0.05	0.22
What is the name and surname of the President of Poland?	0.12	0.33	0.05	0.22
Please count down from 20 to 1.	0.18	0.39	0.19	0.40
Please repeat the address which I have given you.	0.18	0.39	0.29	0.46
Total	2.95	3.49	1.62	2.38

**Table VIII. The respondents' mental capacity according to the AMTS – having and not having children**

Having children	Yes		No	
	No.	%	No.	%
AMTS				
Normal mental capacity	14	19.2	1	4.8
Mild mental capacity	15	20.5	3	14.3
Severe mental capacity	44	60.3	17	81.0
Total	73	100.0	21	100.0

**Discussion**

Hodgkinson’s Abbreviated Mental Test Score (AMTS) is one of the mental health assessment tools within the comprehensive geriatric assessment [6]. Some long-term nursing care patients suffer from some mental impairment, which was assessed in the study by means of the AMTS. The respondents’ average mental capacity was 2.65 points out of 10 points. 64.9% of the surveyed elderly people had severe mental capacity impairment. The studies conducted by Cebulak, Markiewicz and Guty involved 190 long-term nursing patients, 27.37% of whom suffered from severe mental capacity impairment. The average AMTS score was 4.69 points. These authors conclude that the more advanced the age of the respondents is, the more frequent the mental capacity impairments are [3].

The older the respondents were, the more limited their mental capacity was. This was the case with 27.62% of the respondents aged 75–89, and 23.91% of those aged 90 and above. Mild mental impairment: 32.38% and 28.26% respectively. Severe mental impairment: 40.00% and 47.83% [3].

Our own research has shown that the lower one’s level of education is, the more severe the impairment is. Namely, the respondents with primary education suffered from mild and severe mental capacity impairments more frequently (80%) than those with vocational (47.72%),

secondary (64.11%) and higher education (47.05%). Similarly, those who suffered from mental illnesses or co-existing diseases had more limited mental capacity. It has been evidenced that one’s mental capacity significantly determines one’s functional ability [3].

Dziechciaż and her joint authors’ research have shown that 15.7% of 89 long-term nursing care patients had severe mental impairment, and 9% of them had mild mental impairment [5].

Mental disorders have been among the main determinants of long-term nursing care patients’ functional ability [7].

**Conclusions**

1. The vast majority of the long-term nursing care patients had mental capacity impairment.
2. Over 50% of the nursing home residents had severe mental capacity impairment.
3. The main mental capacity impairment determinants were the following: age, sex, education, place of residence, and having or not having children, even though this was not always statistically significant.

**Conflict of interest**

None

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