

THE PREVALENCE OF FUNCTIONAL IMPAIRMENT AMONG PEOPLE AGED OVER 65 YEARS STAYING IN THEIR HOME ENVIRONMENT

CZĘSTOŚĆ WYSTĘPOWANIA UPOŚLEDZENIA FUNKCJONALNEGO WŚRÓD OSÓB W WIEKU POWYŻEJ 65 LAT PRZEBYWAJĄCYCH W ŚRODOWISKU DOMOWYM

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- F. Literature analysis/search
wyszukiwanie i analiza literatury
- G. Funds collection
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Summary

Background. This study aimed to assess the prevalence of functional impairments in people over 65 years of age. **Material and methods.** The study included 504 people (329 women, 175 men) aged over 65 years living in the Subcarpathian region of Poland. The data was obtained through the use of a diagnostic survey using the direct questionnaire technique. The survey included the following research tools: the Barthel scale, the Lawton scale, the Geriatric Depression Scale, the Abbreviated Mental Test Score, and an interview questionnaire of the authors' own construction. **Results.** Respondents capable of performing basic everyday activities comprised more than half of the studied population (58.53%; n=295), those partially impaired constituted 35.32% (n=178), and 6.15% (n=31) were fully impaired. The vast majority of participants (n=458; 90.87%) needed help in performing complex activities. Higher Barthel scale scores indicating better performance in basic everyday activities was obtained by seniors with normal vision and hearing, fewer diseases, and higher education. **Conclusions.** The most frequent deficits in performing basic life activities were controlling urine, moving on flat surfaces, and climbing and descending stairs. Determinants of functional disability among the study subjects were advancing age, female gender, low education level, widowhood, more illnesses, and cognitive and emotional decline.

Keywords: functional performance, home environment, elderly

Streszczenie

Wprowadzenie. Celem pracy była ocena występowania niesprawności funkcjonalnej u osób po 65 roku życia. **Materiał i metody.** Badaniem objęto 504 osoby (329 kobiet, 175 mężczyzn) w wieku powyżej 65 lat, mieszkańców Podkarpacia. Badania przeprowadzono metodą sondażu diagnostycznego, techniką wywiadu bezpośredniego. Zastosowano narzędzia badawcze takie jak: Skala Barthel i Skala Lawtona, Geriatryczna Skala Oceny Depresji, Skrócony Test Sprawności Umysłowej, oraz autorski kwestionariusz wywiadu. **Wyniki.** Osoby sprawne w wykonywaniu podstawowych czynności życiowych stanowiły ponad połowę badanej populacji (58,53%; n=295), osoby częściowo niesprawne 35,32% (n=178), a całkowicie niesprawne 6,15% (n=31). Wśród badanych zdecydowaną większość (n=458; 90,87%) tworzyły osoby potrzebujące pomocy w wykonywaniu czynności złożonych. Wyższe wyniki w ocenie skalą Barthel świadczące o lepszej sprawności w wykonywaniu podstawowych czynności życiowych uzyskiwali badani o prawidłowym wzroku i słuchu, mniejszej liczbie chorób oraz z wyższym wykształceniem. **Wnioski.** Najczęściej pojawiającymi się deficytami w wykonywaniu podstawowych czynności życiowych w badanej grupie było: kontrolowanie moczu, poruszanie się po powierzchniach płaskich oraz wchodzenie i schodzenie po schodach. Determinantami niesprawności funkcjonalnej wśród badanych osób były: postępujący wiek, płeć żeńska, niski poziom wykształcenia, wdowieństwo, większa liczba chorób oraz pogorszenie sprawności poznawczej i emocjonalnej.

Słowa kluczowe: sprawność funkcjonalna, środowisko domowe, seniorzy

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Introduction

Functional performance is defined as the ability to perform basic and complex everyday activities. The former includes eating, moving, maintaining personal hygiene, moving on flat surfaces, climbing and descending stairs, dressing and undressing, using the toilet, and controlling urination and defecation. Complex activities included using the phone, traveling long distances, shopping, preparing meals, doing light and heavy housework, preparing medicines, and managing money. The ability to carry out these activities is essential for maintaining independent functioning in one's home environment. A loss of functional performance reduces one's independence leading to the institutionalization of seniors. Identifying the deficits in daily functioning early is crucial to arrange appropriate assistance, prevent disability, and improve quality of life [1].

The assessment of the functional status of the elderly should be multifaceted and include physical, mental, functional, and socio-environmental evaluation [2,3]. This approach is made possible with a comprehensive geriatric assessment (CGA), i.e. a multidimensional, interdisciplinary diagnostic process that additionally allows the implementation of a complete treatment and care plan [3,4]. CGA provides an opportunity to improve the functional status and quality of life without increasing financial costs [5,6]. The crucial aspect in a CGA is to determine the patient's functional status and limitations rather than focusing on existing diseases [7].

This study aimed to assess the prevalence of functional impairments in people over 65 years of age residing in their home environment and to determine the relationship between functional impairment and selected variables.

Material and methods

This study included 504 respondents aged 66-94 years who were inhabitants of the Subcarpathian region of Poland. The analyses were performed using the direct questionnaire technique. The following research tools were applied:

1. the Barthel scale, used to evaluate performance in basic everyday activities. A score of 0-100 points can be obtained [8,9]. A score of 0-20 points indicates impairment in performing basic everyday activities, 21-85 points imply partial impairment, and 86-100 points reflect the capability to perform basic everyday activities. In the presented study, the obtained information was additionally verified through direct observation of seniors;
2. the Lawton Instrumental Activities of Daily Living scale, used to evaluate the performance of complex everyday activities. A score of 8-24 points can be achieved. A score of 8 points indicates a full lack of independence in performing complex everyday activities, while 24 points imply full capability in this regard [10];
3. the Abbreviated Mental Test Score, used for the screening of intellectual performance. A score >6 points implies normal cognitive status, 6-4 implies moderate impairment, and <4 points reflects severe impairment [11,12];
4. the Geriatric Depression Scale, used for the screening of emotional performance. A score of 0-5 points implies a normal emotional status, 6-10 points implies a suspicion of moderate depression, and 11-15 points reflect severe depression [13-15];
5. an interview questionnaire of the authors' construction, used to assess the sociodemographic and health-related status of a study participant.

The relationships between selected variables were examined with Kendall's tau (τ) co-efficient, Kolmogorov-Smirnov test, Pearson's chi-squared (χ^2) test, Kruskal-Wallis test, and Dunn's post hoc test. All statistical calculations were performed with the use of the STATISTICA 6.0 PL software package.

The study was carried out in accordance with the principles of the Declaration of Helsinki and was anonymous and voluntary. The participants of the study were informed about its goals and the possibility of resigning at any time.

Results

The capability of performing basic everyday activities was assessed with the Barthel scale, in which the respondents obtained scores ranging from 0 (n=7; 1.39%) to 100 points (n=163; 32.34%). The arithmetic mean score was 78.11 points (SD=27.78; Me=95).

Respondents capable of performing basic everyday activities (90-100 points on the Barthel scale) comprised more than half of the studied population (58.53%; n=295), those partially impaired (25-85 points) constituted 35.32% (n=178), and 6.15% (n=31) of seniors were fully impaired (0-20 points).

The highest levels of independence with regards to basic everyday activities were observed for maintaining personal hygiene (86.11% of fully independent respondents), using the toilet (75.00%), and controlling defecation (sphincter ani, 73.81%). In turn, a total lack of independence was most frequently noted for bathing the whole body (29.17%), moving on flat surfaces (20.63%), climbing and descending stairs (18.65%), and controlling urination (urethral sphincters) (17.86%).

The most common deficits observed in the study group in regards to basic everyday activities were controlling urination (urethral sphincters, 58.93%), moving on flat surfaces (40.87%), and climbing and descending stairs (39.48%) (Table 1).

Table 1. Level of the respondents' independence in basic everyday activities

No.	Activity	Answer range	n/%	0 points	5 points	10 points	15 points
1	eating meals	0-10	n	11	129	364	-
			%	2.18	25.60	72.22	-
2	moving from bed to chair and back, sitting down	0-15	n	11	50	86	357
			%	2.18	9.92	17.06	70.83
3	maintaining personal hygiene	0-5	n	70	434	-	-
			%	13.89	86.11	-	-
4	using the toilet	0-10	n	41	85	378	-
			%	8.13	16.87	75.00	-
5	washing, bathing the whole body	0-5	n	147	357	-	-
			%	29.17	70.83	-	-
6	moving on flat surfaces	0-15	n	104	2	100	398
			%	20.63	0.40	19.84	59.13
7	climbing and descending stairs	0-10	n	94	104	305	-
			%	18.65	20.63	60.52	-
8	dressing and undressing	0-10	n	40	116	348	-
			%	7.94	23.02	69.05	-
9	controlling defecation (sphincter ani)	0-10	n	31	101	372	-
			%	6.15	20.04	73.81	-
10	controlling urination (urethral sphincters)	0-10	n	90	207	207	-
			%	17.86	41.07	41.07	-

The scores obtained by the studied seniors in the assessment of complex everyday activities (Lawton scale) ranged from 8-24 points, with the mean number of points equal to 17.04 (SD=5.48; Me=18). The vast majority of respondents (n=458; 90.87%) needed help in performing complex activities. Full capability (24 points) was observed in only 9.13% (n=46) of seniors. Among complex activities, participants had the fewest problems managing money (65.48% of fully independent respondents), preparing and taking medicines (62.30%), and preparing meals (52.18%). The most common activities subjects were fully dependent in performing included doing heavy housework (69.44%), shopping (42.26%), and arriving at places "beyond the walking distance" (36.11%). Participants most commonly had partial deficits in doing heavy housework (88.69%), shopping (59.52%), and arriving at places "beyond the walking distance" (56.15%) (Table 2).

Table 2. Level of the respondents' independence in complex everyday activities

No.	Question	Total lack of independence		Capability to perform with some assistance		Capability to perform without assistance	
		n	%	n	%	n	%
1	Are you able to use the phone?	145	28.77	105	20.83	254	50.40
2	Are you able to arrive at places beyond the walking distance?	182	36.11	101	20.04	221	43.85

3	Do you go shopping on your own?	213	42.26	87	17.26	204	40.48
4	Are you able to prepare meals on your own?	136	26.98	105	20.83	263	52.18
5	Are you able to do light housework?	135	26.79	123	24.40	246	48.81
6	Are you able to do heavy housework?	350	69.44	97	19.25	57	11.31
7	Are you able to prepare and take medicines on your own?	106	21.03	84	16.67	314	62.30
8	Are you able to manage money?	100	19.84	74	14.68	330	65.48

The analyses carried out in regards to the Barthel scale revealed that on average women scored fewer points (75.08) than men (83.80). Similar results were obtained with analysis using the Lawton scale (women: 16.51; men: 18.03). These results imply women were less capable of performing basic ($p<0.001$) and complex ($p<0.05$) everyday activities.

A comparison of the degree of independence in performing basic everyday activities showed that women were less likely to be fully independent compared to men ($p<0.001$), and were more often partially independent ($p<0.01$). No significant differences were revealed between the sexes in the prevalence of total impairment with performing basic everyday activities.

As indicated by the chi-squared test, male seniors (16.57%) were considered totally independent (Lawton scale score: 24) in performing complex everyday activities more often than female seniors (5.17%, $p<0.001$).

Kendall's tau (τ) coefficient revealed an inversely proportional correlation between the respondents' age and the results obtained using the Barthel ($\tau=-0.4081$; $p<0.001$) and Lawton ($\tau=-0.4549$; $p<0.001$) scales. This illustrates the relationship between aging and the decline in performing basic and complex everyday activities.

The lowest scores on the Barthel (mean: 69.79) and Lawton (mean: 15.08) scales, identifying deficits in performing both basic and complex everyday activities, were recorded by widowed respondents. The highest scores were achieved by married subjects (86.43 on the Barthel scale; 18.76 on the Lawton scale), and bachelors and maids recorded slightly lower scores (81.11 on the Barthel scale; 17.78 on the Lawton scale). Comparison of these groups using the Kruskal-Wallis and Dunn's tests found all differences to be statistically significant ($p<0.01$).

Also, a statistically significant relationship was discovered between the respondents' level of education and the results on the Barthel scale ($\tau=0.3106$; $p<0.001$) and Lawton scale ($\tau=0.3473$; $p<0.001$). The ability to perform basic and complex everyday activities was better in seniors with higher education levels.

Kendall's tau (τ) coefficient revealed a relationship between the number of diseases and a decrease in scores obtained by seniors on the Barthel scale ($\tau=-0.3300$; $p<0.001$) and Lawton scale ($\tau=-0.3347$; $p<0.001$). The ability to perform basic and complex everyday activities deteriorated with the increasing number of diseases affecting the participant. Kendall's tau (τ) coefficient also identified an inversely proportional correlation between the respondents' scores in the Geriatric Depression Scale and their results on the Barthel scale ($\tau=-0.4100$; $p<0.001$) and Lawton scale ($\tau=-0.4227$; $p<0.001$). It was observed that decreases in a senior's emotional skills resulted in their independence performing activities deteriorated. Moreover, the Barthel ($\tau=0.4565$; $p<0.001$) and Lawton ($\tau=0.4912$; $p<0.001$) scale results correlated with those of the Abbreviated Mental Test Score. As cognitive skills decreased in the respondents so did their ability to perform basic and complex everyday activities.

Discussion

The functional capability of a person determines their ability to live independently and to perform basic and complex activities. A loss in functional capability results in an individual having to depend on other people or reside in an institution [16-18]. Previous research has shown the coexistence of various diseases and disorders contributes to a decrease in a senior's functional skills [19]. Other authors have published on the impact advanced age has on the impairment of activities and that elderly people initially experience disability in complex activities followed by basic everyday activities [20,21]. This is supported by our study which found that more than half of the participating seniors were able to perform basic everyday activities but only about 1 in 10 of them were completely independent in terms of complex everyday activities. It was also observed that with the loss of independence in performing complex activities the ability to perform basic everyday activities deteriorated as well. Therefore, one can imply that the impairment progresses systematically starting with complex everyday activities and gradually involving basic activities. Our study also found that functional

independence significantly deteriorated with a subject's age, as well as with the number of diseases affecting the patient. However, it affected women and the widowed to a lesser extent. Similar results were seen in the PolSenior study, which showed that among people aged 65 years or older, the vast majority (>90%) were capable of performing basic everyday activities and respondents independent in instrumental activities constituted the minority (47.9%). The loss of independence in performing both basic and complex everyday activities increased with age and was more frequently observed in women, especially those in higher age ranges. Additionally, it was revealed that impairment in complex everyday activities occurred more frequently in people living in rural areas compared to city dwellers [22]. A greater impairment in the everyday life of elderly women was also identified by Hardy et al. [23]. Bogusz et al. [24] obtained similar results in their analyses of seniors aged 70 years or older living in rural areas within the Lublin Province of Poland. They were able to show a high rate of independence with regard to basic everyday activities using the Barthel scale. In addition, they found that widowhood and progressing age were significant factors correlated with impairment in basic everyday activities. The relationship between widowhood and difficulty with complex everyday activities was similarly shown by Dziechciaż et al. [25].

Research on impairments with complex everyday activities among seniors aged 65 and older was also conducted by Pędich et al. [26]. They revealed that patients were most likely to show deficits in doing heavy housework (19.8%), shopping (16.6%), moving around outside the home (12.0%), and preparing meals on their own (11.3%). The participants experienced fewer impairments in basic everyday activities, i.e. dependence in taking medicines (6%), dressing (3.5%), and, even less often, eating meals (1.4%). Nevertheless, the authors did not observe any significant relationship between the need for assistance in carrying out the above-mentioned activities and the subjects' sex except for taking medicines and dressing in which more men often needed help. In addition, a significant correlation was noted between impairment in these activities and the patient's progressing age and declining cognitive abilities.

Dziechciaż et al. [25], performed a study evaluating inhabitants of rural areas that were over 60 years old and were able to show that seniors most often experienced impairments in doing heavy housework (69.7%), shopping (61.8%), and arriving at places "beyond the walking distance" (51.7%). Impairment with complex everyday activities evaluated using the Lawton scale correlated with progressing age. However, the authors did not observe any relationship between gender and impairment in performing complex everyday activities.

Our paper confirmed that a total loss of independence in complex everyday activities most often occurred with doing heavy housework (69.44%), shopping (42.26%), and arriving at places "beyond the walking distance" (36.11%), which is supported by the above-quoted research. Moreover, the impairment in basic everyday activities most often concerned controlling urination (urethral sphincters) (58.93%), moving on flat surfaces (40.87%), and climbing and descending stairs (39.48%). The high prevalence of urinary incontinence among seniors has also been implied by other authors [27].

The statistical analyses revealed that lower scores in the Barthel and Lawton scales indicated a greater deficit in performing basic and complex everyday activities in respondents with worse cognitive and emotional skills. These findings are in line with many reports by Polish and foreign authors [28-30].

Conclusions

1. The majority of seniors over 65 years old living in rural areas showed impairment in performing at least one complex everyday activity.
2. Impairment in basic everyday activities was present in over 1/3 of the studied seniors.
3. The most frequently observed deficits in basic everyday activities were controlling urination (urethral sphincters), moving on flat surfaces, and climbing and descending stairs.
4. A total dependence with regards to complex everyday activities was most often reported for doing heavy housework, going shopping, and arriving at places "beyond the walking distance".
5. Among the respondents, the following determinants of functional impairment were observed: progressing age, female sex, low level of education, widowhood, a greater number of diseases, and cognitive and emotional impairment.

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