Polish Annals of Medicine

Research paper

Assessment of socio-demographics, cognitive function and depressive symptoms in homeless seniors and community-dwelling seniors – a pilot study

Klaudia Drabiak ⓘ*, Antonina Gabriela Kaczorowska* ⓘ*, Agata Elwira Mroczek* ⓘ

Institute of Health Sciences, University of Opole, Poland

ABSTRACT

Introduction: The effects of homelessness on homeless people are large. Elderly homeless are in a particularly difficult situation. Being rejected from professional, social and cultural life, homeless seniors may develop depression and cognitive dysfunction.

Aim: The aim of the study was to assess socio-demographic variables of homeless seniors and to assess the intensity of depression symptoms and the cognitive functions of older people from different life environments.

Material and methods: Forty people aged 65 and over from the Opolskie Voivodeship were examined. The study group consisted of 20 homeless people. The control group consisted of 20 people living independently. Socio-demographics included age, gender, marital status, education and working status. The 15-point geriatric depression scale (GDS) was used to assess symptoms of depression. The clock drawing test (CDT) in the Sunderland version was used to assess cognitive functions.

Results and discussion: The homeless seniors and those living independently differed statistically significantly in terms of education ($P < 0.001$) and working status ($P = 0.004$). The differences in GDS between the groups were not statistically significant. The differences in CTD between the groups were statistically significant ($P = 0.029$). Homeless seniors have significantly greater cognitive impairment. The collected results in our own study, using the GDS and CDT scale, do not indicate a diagnosis of depression and cognitive disorders, but may only suggest their occurrence.

Conclusions: Homeless seniors most often have a low level of education and are unemployed. Seniors experiencing homelessness demonstrate lower cognitive functioning.

Corresponding author: Antonina Gabriela Kaczorowska, Institute of Health Sciences, University of Opole, Katowicka 68, 45-060 Opole, Poland. Tel.: +48 692 639 634.
E-mail address: antonina.kaczorowska@uni.opole.pl

1. INTRODUCTION

Homelessness is a global issue that occurs in almost all countries of the world. The problem of homelessness can be analysed on many levels, i.e. as a social problem, a symptom of a specific pathology or a negative life situation of an individual. The European Federation of National Organizations Working with the Homeless (FEANTSA) published in 2004 the European Typology of Homelessness and housing exclusion (ETHOS). There are three levels on which homelessness affects the homeless: (1) the physical (premises, e.g. house providing protection against unfavourable weather conditions), (2) the social (privacy, intimacy) and (3) the legal (the feeling of home security and the protection of material goods).[1]

In 2019, the Ministry of Family, Labour and Social Policy in Poland compiled its nationwide statistics for the homeless. The reasons prevalent in Poland for homelessness were: (1) family conflicts – 32.2%, (2) addiction – 27.9%, (3) eviction, deregistration – 26.3%, (4) breakdown of relationships – 18.4%, (5) debt, unemployment, poor health, disability, leaving prison, domestic violence and mental illness.[2]

Homelessness has numerous consequences for people's lives and for the population at large. The first is to eliminate the homeless from social life in violation of their dignity. The homeless are often dependent on institutions and other people. Moreover, they have to endure finger-pointing and humiliation from the rest of society. Another consequence is the inability to find gainful employment without a permanent place of residence. It all adds up to the so-called 'vicious cycle' that blocks the way out of homelessness.[3] The COVID-19 occurring in the shelter for the homeless does not differ from the predictable course of the development of infection in a closed environment and may have the epidemiological consequences for the general population.[4]

Homeless seniors over 60 are in a particularly difficult situation. Shunned from professional, social and cultural life, homeless seniors may develop depression and cognitive dysfunction.

In the elderly, the factors that cause depression are diverse. Psychosocial factors include loneliness, difficult financial situation, and a feeling of uselessness after retirement. Biological factors include chronic diseases, medications (steroids, metformin), endocrine disorders, deficiency states (e.g. vitamin D, vitamin B_{12}, folic acid) and disability. Psychological factors include loss of loved ones, due to death or moving out, material damage, negative thoughts, low self-esteem, arguments and conflicts with loved ones. Bad experiences from childhood and adolescence can also contribute to depression. These are associated with emotional sensitivity, exclusion from society and a tendency to experience stress. Endogenous factors include genetic burden, somatic diseases and changes in the brain that reduce the number of neurons and neurotransmitters.[5–7]

Diagnosing depression in the elderly is a challenge for doctors and therapists. Disorders experienced by the patient may be symptoms of depression, as well as dementia. Depression is associated with cognitive impairment, such as slowness, and indisposition of executive functions and working memory, which contributes to the deterioration of well-being and persists even after recovery from depression. In addition, there are problems with basic life activities, which lead to impaired psychosocial activity, in turn disrupting everyday functioning. Problems with information processing cause erroneous thinking and cognitive deficits, such as attention and concentration disorders.[8–10]

Due to the demographic forecasts regarding the increase in the number of elderly people, there is a need to monitor the risk of depression and cognitive impairment in seniors constantly.

2. AIM

The aim of the study was to assess: (1) selected socio-demographic variables of homeless seniors, (2) the frequency and intensity of depression symptoms, and (3) the cognitive functions of older people from different life environments.

Research hypotheses: (1) Homeless seniors have a lower level of education and are more often unemployed than seniors living independently. (2) Being homeless increases the severity of symptoms of depression and reduces cognitive functions.

3. MATERIAL AND METHODS

3.1. Study design and setting
The research was conducted from January to February 2021 in the Opolskie Voivodeship in Poland. The research was carried out in the Dom Nadzei – a facility of the Association for Aid to the Homeless, Poor and Socially Excluded in Opole, and in the homes of people who live independently in the Opolskie Voivodeship. The Strengthening the Reporting of Observational Studies in Epidemiology (STROBE) guidelines were followed.

3.2. Participants
In total, 40 people aged 65 and over from the Opolskie Voivodeship were examined. The study group consisted of 20 homeless people who were recruited from the Association for Aid to the Homeless, Poor and Socially Excluded. The control group consisted of 20 people living independently. The inclusion criteria were: (1) age 65 and above, (2) voluntary informed consent to the study, and (3) homeless status for the study group or independent living for the control group. The exclusion criteria were: (1) age under 65, (2) no verbal contact, which would make it impossible to conduct the study, and (3) no consent to participate in the study. The mean age of homeless seniors was 68.90 ± 3.52 years and the mean age of people living independently was 69.10 ± 3.27 years.

3.4. Methods
Socio-demographics included age, gender, marital status, education and working status.

The 15-point geriatric depression scale (GDS) was used to assess symptoms of depression.[11,12] This version of the GDS consists of 15 questions about the person's well-being in the last 2 weeks. In each question, the respondent marks the answer 'Yes' or 'No.' For each question, the respondent may receive 0 or 1 point.[11,12] The score suggested no depression (range 0–5), moderate depression (range 6–10) or severe depression (range 11–15).

The Sunderland version of the clock drawing test (CDT) was used to assess cognitive functions.[13,14] This test is used to determine the value of the processes of visual-spatial analysis and synthesis, planning and abstract thinking. The task of the subject is to draw the clock face, mark the hours and draw the hands of the clock so that they point to the given time. The most common time is 11.10 am. In the CDT in the Sunderland version, the participant may receive a maximum of 10 points: the higher the score, the better. In the range 6–10, there are drawings that are basically correctwith any slight or obvious errors in the position of the hands. While in the range 1–5 there are incorrect drawings, in which the drawing of numbers and the clock face is also disturbed.[14]

3.5. Statistical methods

The obtained data was encoded and transferred to MS Office Excel 2017 and then subjected to statistical analysis using Statistica v. 13.3 (TIBCO Inc., Tulsa, United States). Descriptive statistics were calculated: mean (M), median (Me), standard deviation (SD), lower quartile (Q_1) and upper quartile (Q_3). The distribution of the variables was assessed in terms of normality using the Shapiro–Wilk test. Nonparametric methods were used. The Mann–Whitney U test was used to assess the significance of differences between the two independent variables for the results of the study and the control groups. The results of qualitative scales in the analysed groups were compared by χ^2 Pearson's test. A P-value of less than 0.05 was considered statistically significant.

4. RESULTS

Table 1 presents the socio-demographic characteristics of the participants, which included gender, marital status, education and working status. The homeless seniors and those living independently differed statistically significantly in terms of education ($P < 0.001$). Most of the homeless people had received primary education (70%), and among those living independently, most had received vocational (50%) or secondary (35%) education. The highest percentage of homeless people (70%) were unemployed, while among those living independently, the highest percentage (70%) was retired. Other differences in age and marital status were not statistically significant.

As shown in Table 2, the mean GDS score in the study group was 7.55 ± 3.66 points, while the median was 8 points. The mean value in the control group was 7.40 ± 2.85 points, while the median was 7 points. The differences between the groups were not statistically significant. In the CDT, the study group obtained a mean score of 3.65 ± 3.82 points, and

Table 1. Socio-demographic characteristics of the participants.

Variables	Study group $n(\%)$	Control group $n(\%)$	Chi²
Gender			
Male	14(70)	10(50)	0.196
Female	6(30)	10(50)	
Marital status			
Married	2(10)	6(30)	
Single	12(60)	3(15)	0.055
Widowed	4(20)	11(55)	
Divorced	2(10)	0(0)	
Education level			
Primary	14(70)	3(15)	
Vocational	3(15)	10(50)	<0.001★
Secondary	1(5)	7(35)	
University	2(10)	0(0)	
Working status			
Employed	2(10)	2(10)	
Unemployed	14(70)	4(20)	0.004★
Retirement	4(20)	14(70)	

Comments: ★ $P < 0.05$.

Table 2. Statistical characteristics of the results of GDS and CDT.

Test	Study group			Control group			P
	M±SD	Me	Q1–Q3	M±SD	Me	Q1–Q3	
GDS	7.55 ± 3.66	8	4.5–10.5	7.40 ±2.85	7	5.0–9.5	0.758
CDT	3.65 ± 3.83	1	1–8.5	6.45±3.70	7	2.5–10	0.029★

Comments: ★ $P < 0.05$.

Table 3. Percentage of depression and cognitive impairment of participants.

Variables	Study group $n(\%)$	Control group $n(\%)$	Chi²
GDS			
Normal condition	6 (30)	6(30)	
Moderate depression	12(60)	11(55)	0.705
Severe depression	2(10)	3(15)	
CDT			
10 points	2(10)	7(35)	
6–9 points	4(20)	6(30)	0.064
1–5 points	14(70)	7(35)	

a median of 1 point. The control group obtained 6.45 ± 3.70 points, and a median of 7 points. Homeless seniors had significantly greater cognitive impairment ($P = 0.029$).

In the study group, symptoms of severe depression were noted in 10% of the participants, moderate depression in 60%, while the normal condition was reported by 30%. In the control group, these statistics were 15%, 55% and 30% of participants, respectively. In the study group, the maximum

score of 10 points in the CDT was obtained by 10% of the participants, a score in the range of 6–9 points by 20%, and a score in the range of 1–5 points by 70%. In the control group, the maximum result in the CDT was obtained by 35% of the participants, a score in the range of 6–9 points by 30%, and a score in the range of 1–5 points by 35%. The differences were not statistically significant (Table 3).

5. DISCUSSION

The first aim of the study was to assess selected socio-demographic characteristics of homeless seniors. The level of education and professional activity differ significantly between homeless seniors and those living independently. Primary education predominates among the homeless, and vocational and higher education prevails among community dwellers. In the group of people living independently, 70% of respondents received retirement or disability pensions. This shows that these seniors have worked in the past. In the group of the homeless, however, only 20% received a retirement pension. In both groups, 10% of the surveyed seniors still worked. The large percentage of homeless who did not receive benefits, and therefore probably did not work in the past (70%), proves that unemployment may be the cause of the respondents' homelessness. This thesis is confirmed by Moraczewska, according to which unemployment is one of the causes of homelessness.[1]

Low education may result in difficulties in finding a job, and unemployment is one of the causes of homelessness.[2] Research by the Ministry of Family, Labour and Social Policy in Poland from 2019 confirms that most of the homeless have vocational or primary education.[2]

The second aim of the study was to assess depression and cognitive functions among homeless and independently living seniors. The intensity of depression symptoms in both groups did not differ significantly. The percentage of people without depression and with moderate and severe depression was also similar. The mean results in both groups indicate moderate depression. Also, the percentage of people with moderate depression is the highest in both groups. Only 30% of seniors in each group did not have depression.

The high prevalence of depression among the elderly is worrying. The consequences of undiagnosed and untreated depression are considerable. From the point of view of rehabilitation, persistent depression in people with physical disorders after a severe illness is associated with lack of improvement in physical functioning. Depression can probably be associated with an increased incidence of various diseases among nursing home residents, which is also evident in elderly hospitalised patients. If so, the need for care and other healthcare services would be greater for people with depression than for healthy people, and the financial costs would also be higher. Recent data indicate increased mortality among nursing home residents with major depressive disorders. Depression in long-term care facilities is a condition with questionable prognosis and with negative medical, social and financial consequences.[15] Psychological complications in depression, such as emotional, behavioral and cognitive disorders, can have a negative effects on the social functioning and the overall quality of life.[16] Although depressive disorders in old age can be alleviated and even cured with appropriate therapy, they often go unnoticed, especially in nursing home residents. Thus, they remain untreated. This indicates a deficit in healthcare and may result not only in lower quality of life among those concerned, but also in poor physical functioning, premature mortality and an increased number of hospitalisations.[17]

The term 'mild cognitive impairment' has long been equated with the transition state between normal cognitive functioning and the symptoms of Alzheimer's disease. Currently, the term is used in a broader sense, to include patients without known dementia but with apparent cognitive deficits. It is estimated that in the general population of people over 60 years of age, 15%–30% show mild cognitive impairment and its incidence increases with age.[18,19] In the authors' own research, homeless seniors have significantly greater cognitive dysfunctions. As many as 70% of the homeless and 35% of seniors living in the local community have scores in the range of 1–5 points, which means that their drawings are fundamentally wrong. Only 10% of the homeless and 35% of seniors living in the local community achieved the maximum score on the CDT. Changes in the brain lead to the weakening of cognitive processes with age. The relationship between the state of brain damage and the clinical picture, however, especially cognitive deterioration, is modified by the plasticity of the brain and the presence of the so-called cognitive reserve. This cognitive reserve depends, inter alia, on environmental stimulation.[20] For homeless seniors, who do not have their own place of residence, this stimulation is probably insufficient.

Depressive syndromes and cognitive impairment are among the most common psychopathological symptoms observed in elderly people.[21] Symptoms of depression and disorders of cognitive functions can be identified with the ageing process of organisms, and in many cases it is difficult to determine clearly what is a cause and what is an effect. In the initial stage of cognitive decline and depression, symptoms may be similar. Sometimes, different syndromes occur simultaneously.[21,22] Studies by other authors show that depressive symptoms are risk factors for cognitive deterioration.[23] Wilmańska and Gułaj performed cognitive screening tests on 80 seniors and found a significant correlation between the impact of depression severity on the occurrence of cognitive disorders.[24] The most common cognitive deficits in depression are disorders in executive functions, attention, short-term memory and psychomotor skills.[25] Executive function deficits occurring alongside severe depression mean that patients do not set or pursue life goals, they lose the ability to create plans, even those related to daily activities, and withdraw from social roles.[26]

Early diagnosis of depression and related cognitive disorders in seniors will allow for the implementation of treatment and improve the quality of life of patients.

It should be noted that the collected results in our study, using the shortened GDS and CDT scales, do not indicate a diagnosis of depression and cognitive disorders, but may only suggest their occurrence. Both scales are helpful in assessing the elderly population. This study reports on the level of depression symptoms and cognitive impairment, but not on their clinical symptoms.

6. CONCLUSIONS

(1) Homeless seniors most often have a low level of education and are unemployed.
(2) Seniors experiencing homelessness demonstrate lower cognitive functioning.
(3) There was no increased severity of depression symptoms in homeless seniors.
(4) In future studies, more people should be included in order to interpret the obtained results in a more comprehensive manner.

References

1 Moraczewska B. Homelessness. Definition, problems, solutions, and present historical reference to people loose [in Polish]. *St Gd*. 2013;10:113–128.

2 Ministry of Family, Labor and Social Policy. *Results of the National Survey on the Number of Homeless People – 2019 Edition*. https://www.gov.pl/web/rodzina/wyniki-ogolnopolskiego-badania-liczby-osob-bezdomnych-edycja-2019. Published March 15, 2019. Accessed April 7, 2022.

3 Cendrowicz D. The theory of rational legislator and social assistance law. Remarks on the way of determination of commune's territorial jurisdiction in cases regarding granting social benefits to the homeless [in Polish]. *Acta UWr PPiA*. 2020;120(2):591–603. https://doi.org/10.19195/0137-1134.120.93.

4 Ochal M, Kuchta R, Tokarczyk-Malesa K, Romaszko M, Skutecki R. A COVID-19 Micro-epidemic in the Shelter for the Homeless in Olsztyn. *Pol Ann Med*. 2021;28(2):194–198. https://doi.org/10.29089/2021.21.00180.

5 Kałucka S. Characteristics of depression in the elderly – etiology, diagnosis and treatment [in Polish]. *Geriatria*. 2014;8:240–247.

6 Filipska K, Pietrzykowski Ł, Ciesielska N, Dembowski Ł, Kędziora-Kornatowska K. Depressive disorders in elderly patients – the literature review [in Polish]. *Gerontol Pol*. 2015;4:215–219.

7 Basterzi AD, Aydemir C, Kisa C, Aksaray S, Tuzer V, Yazici K, et al. IL-6 levels decrease with SSRI treatment in patients with major depression. *Hum Psychopharmacol*. 2005;20:473–476. https://doi.org/10.1002/hup.717.

8 Jaeger J, Berns S, Uzelac S, Davis-Conway S. Neurocognitive deficits and disability in major depressive disorder. *Psychiatry Res*. 2006;145:39–48. https://doi.org/10.1016/j.psychres.2005.11.011.

9 Etkin A, Gyurak A, O'Hara R. A neurobiological approach to the cognitive deficits of psychiatric disorders. *Dialogues Clin Neurosci* 2013;15:419–429. https://doi.org/10.31887/dcns.2013.15.4/aetkin.

10 Murrough JW, Iacoviello B, Neumeister A, Charney DS, Iosifescu DV. Cognitive dysfunctions in depression: neurocircuitry and new therapeutic strategies. *Neurobiol Learn Mem*. 2011;96:553–563. https://doi.org/10.1016/j.nlm.2011.06.006.

11 Yesavage J, Brink T, Rose T, Lum O. Huang V, Adey M, et al. Development and validation of a geriatric depression screening scale: A preliminary report. *J Psychiatr Res*. 1983;17(1):37–49. https://doi.org/10.1016/0022-3956(82)90033-4.

12 Grodzicki T, Kocemba J, Skalska A, ed. *Geriatrics with elements of general gerontology: A textbook for physicians and students*. Kraków: Via Medica; 2006.

13 Sunderland T, Hill JL, Mellow AM, Lawlor BA, Gundersheimer J, Newhouse PA, et al. Clock drawing in Alzheimer's discase. A novel measure of dementia severity. *J Am Geriatr Soc*. 1989;37:725–729. https://doi.org/10.1111/j.1532-5415.1989.tb02233.x.

14 Krzymiński S. The clock-drawing test [in Polish]. *Postępy Psychiatr Neurol*. 1995;4(Suppl 1): 21–30.

15 Abrams RC, Teresi JA, Butin DN. Depression in nursing home residents. *Clin Geriatr Med*. 1996;8(2):309–322.

16 Mroczkowska D, Bałdyga E, Żechowicz T, Gromadziński L. Neuropsychological rehabilitation of patients with symptoms of depression after ischemic stroke. *Pol Ann Med*. 2019;26(2):130–133. https://doi.org/10.29089/2019.19.00082.

17 Tesky WA, Schall A, Schulze U, Stangier U, Oswald F, Knopf M, et al. Depression in the nursing home: a cluster-randomized stepped-wedge study to probe the effectiveness of a novel case management approach to improve treatment (the DAVOS project). *Trials*. 2019;20(1):424. https://doi.org/10.1186/s13063-019-3534-x.

18 Petersen RC, Negash S. Mild cognitive impairment: an overview. *CNS Spectr.* 2008;13:45–53. https://doi.org/10.1017/s1092852900016151.

19 Bradford A, Kunik ME, Schulz P, Williams S, Singh H. Missed and delayed diagnosis of dementia in primary care: prevalence and contributing factors. *Alzheimer Dis Assoc Disord.* 2009;23:306–314. https://doi.org/10.1097/wad.0b013e3181a6bebc.

20 Gryglewska B. Consequences of the ageing process on health. In: Gryglewska B, Grodzicki T, ed. *Vademecum of Geriatrics for the Practitioner*. Tom I. Gdańsk: Via Medica; 2016:9–17.

21 Szczepańska-Gieracha J, Jaworska L, Mazurek J, Skrzek A. Biopsychosocial approach for the treatment of depression in the elderly [in Polish]. *Gerontol Współcz.* 2017;3(5):108–112.

22 Chen CM, Liu LF. The effect of disability and depression on cognitive function and screening factors. *Arch Gerontol Geriatr.* 2017,73:154–159. https://doi.org/10.1016/j.archger.2017.07.019.

23 Donovan NJ, Wu Q, Rentz DM, Sperling NA, Marshall GA, Glymour M.M. Loneliness, depression and cognitive function in older U.S. adults. *Int J Geriatr Psychiatry.* 2017;32(5),564–573. https://doi.org/10.1002/gps.4495.

24 Wilmańska J, Gułaj E. Assessment of cognition disorders in elderly adults – attempt to compare different screening methods [in Polish]. *Gerontol Pol.* 2019;16(2):111–118.

25 Gonda X, Pompili M, Serafini G, Carvalho AF, Rihmer Z, Dome P. The role of cognitive dysfunction in the symptoms and remission from depression. *Ann Gen Psychiatry.* 2015;14(1):27. https://doi.org/10.1186/s12991-015-0068-9.

26 Czerwińska A, Pawłowski T. Cognitive dysfunctions in depression – significance, description and treatment prospects. *Psychiatr Pol.* 2020;54(3):453–466. https://doi.org/10.12740/pp/onlinefirst/105415.