

Loneliness among elderly people as a public health threat

ANNA SUSŁO^{1, A, B, D-F}, SYLWIA MIZIA^{2, B, D, F}, EWA POCHYBEŁKO^{3, B, D, F}, EWA HOROCH-ŁYSZCZAREK^{4, B, D, F}
 ORCID ID: 0009-0004-6771-9682 ORCID ID: 0000-0001-5922-7750

¹ St Luke's Hospital in Bolesławiec, Bolesławiec, Poland

² Epidemiology and Health Education Unit, Population Health Department, Faculty of Public Health, Wrocław Medical University, Wrocław, Poland

³ Non-public Healthcare Center KINESIS, Bielawa, Poland

⁴ Lower Silesian Specialist Hospital – Center for Emergency Medicine, Wrocław, Poland

A – Study Design, **B** – Data Collection, **C** – Statistical Analysis, **D** – Data Interpretation, **E** – Manuscript Preparation, **F** – Literature Search, **G** – Funds Collection

Summary Each day, primary care physicians see many lonely elderly people with multiple complaints, who sometimes can be labelled “over-demanding” or even “abusing health services”; in fact, this phenomenon results from general deficiencies and insufficiency in social support. A literature review has been carried out in order to identify the characteristics of loneliness in people aged sixty years and older, and its health-related consequences. Loneliness causes sensory deprivation and emotional starvation, which translate into a subjective feeling of discomfort and distress, as well as into objective behavioral changes. Loneliness is a prognostic factor for worsened health and cognitive status in the elderly. The limited ability of elderly people to take care of themselves as a result of deterioration in health does not itself lead to loneliness and abandonment if the social support system is not deficient. Paradoxically, policies intended to protect the elderly often result in negative phenomena, such as actual discrimination justified on the basis of paternalistic and generalizing assumptions. Loneliness among elderly people is becoming a serious public health problem in modern atomized, ageing societies. This thus demands urgent action from the Polish state, aimed at providing the elderly with organized social support in order to adequately protect their health and well-being. Currently, different levels of the health system, including primary care physicians, are forced to deal with the increasing fallout of loneliness, which presents in the form of physical and mental illnesses, as well as psychosomatic ailments.

Key words: health services for the aged, disabled persons, loneliness, health care economics and organizations, health equity, right to health.

Susło A, Mizia S, Pochybełko E, Horoch-Łyszczarek E. Loneliness among elderly people as a public health threat. *Fam Med Prim Care Rev* 2023; 25(1): 107–110, doi: <https://doi.org/10.5114/fmpcr.2023.126026>.

Background

Developed countries, including Poland, suffer from the ageing of society [1]. The ability to perform everyday activities deteriorates with age [2], especially when there are comorbidities [3]. The stress of being unable to adjust to the pressure and demands of the rapidly changing modern world without adequate social support can result in multiple health hazards, especially in older people; these range from apathy through addictions and various other self-harm activities to suicide; indeed, highly demonstrative suicide through hanging [4] was aggravated by the COVID-19 pandemic [5]. On the contrary, morbid thoughts and suicidal ideation are less common among older people who are visited by friends several times a month and who participate in clubs, public meetings, and other social gatherings, and who visit friends several times a year [6]. Each day, primary care physicians see many lonely elderly people with multiple complaints, who sometimes can be labelled “over-demanding” or even “abusing health services”; in fact, this phenomenon results from a general deficiencies and insufficiency in social support.

Material and methods

A literature review has been carried out in order to identify the characteristics of loneliness in people aged sixty years and older, its health-related consequences, and available methods of dealing with them.

Results

Loneliness causes sensory deprivation and emotional starvation [7], which translate into a subjective feeling of discomfort and distress, as well as into objective behavioral changes, such as modified indoor and outdoor mobility [8]. The intensity of loneliness can be objectively measured and compared across individuals using objective tools, such as the University of California Los Angeles Loneliness Scale (ULS-8) [9]. Although loneliness is steeply increasing among young people [10], it most common problem among the elderly, where it affects about one in three [11] – particularly females, widows, and divorcees who now live alone and did not establish friendships earlier in life, as well as people discriminated against because of a health condition that is visible or known to their environment [12]. Having offspring has a protective effect against loneliness, and the negative effects among the widowed tend to decrease with years of widowhood [11]. Lonely old people are deprived of the proven benefits of intergenerational face-to-face contact, with human physical and mental health, social skills, and relationships [13]. Though often advised, adopting a pet to fight loneliness and avoid depression has not been definitely proven to be effective [14]. Over the last few decades, increasing urbanization and the migrations of the young workforce exacerbates the burdens of loneliness, depression and anxiety among elderly people, especially those who are left to live alone in scarcely populated



rural areas [15, 16]. Paradoxically, policies intended to protect the elderly often result in negative phenomena, such as actual discrimination justified on the basis of paternalistic and generalizing assumptions that the old people are “vulnerable” or not self-reliant, and that any limitations imposed on them are always “for their own good” [17]; this is especially true in the case of elderly people with intellectual disabilities, the impact of which tends to be overblown [18]. Institutionalization of elderly people tends to worsen the problem, as it often affects patients who end up confined to their rooms, which increases their social isolation. This is especially drastic in times when epidemiological countermeasures are in place [19, 20], as it deprives people of everyday occupations, routines, and desired activities, as well as visits from the outside of the institution [21].

Loneliness is a prognostic factor for worsened health and cognitive status in the elderly [22], which is already impaired by the sensory deficits common in old age, especially visual impairment [23]. On the other hand, elderly people with poor health status are also more likely to suffer from loneliness, and any episode of severe illness is likely to exacerbate this; chronic diseases do not have such a pronounced effect [24]. The sense of loneliness can also lead to a decrease in the quality of life of elderly people, especially those who live with three or more diseases [25]. Social isolation and loneliness are considered to be the essential triggers of depression in the elderly [17], but other mental and physical health disturbances are also significant, especially among women, who more often live alone due to their greater longevity than men [26]. Loneliness-related pathologies tend to intensify each other. Loneliness among the elderly is not significantly lessened by smartphone or video calls [11], but the Internet can limit social isolation, help form new social connections, and possibly also provide social support [27]. The perceived loneliness of elderly people who used mobile Internet can be decreased by a third compared to those who do not [28]. Unfortunately, although the average level of digital literacy among the elderly is still low [29], loneliness increases the risks posed by the Internet [7], such as mobile phone addiction, including sleep disturbances and depression [30]. Loneliness and depression are among the main risks of lower physical activity [22], and obesity is a problem among those older people who use food as a means of escape from stressful states and situations [31]. Paradoxically, elderly people who consider themselves lonely are also at an increased risk of poor nutritional status [32] or even of severe malnutrition [33, 34].

The limited ability of elderly people to take care of themselves as a result of deterioration in health does not itself lead to loneliness and abandonment if the social support system is not deficient [35]. The Polish state is legally bound to establish a health and safety-oriented environment and to at least participate in covering the costs its functioning [36]. It is impossible for the complicated set of structures and procedures that make up the modern health and safety systems environment to function properly without state-regulated electronic information systems that contain sensitive data, and which thus require strong security measures [37]. Healthcare costs in general continue to rise worldwide, but the cost of treating older patients, especially in hospitals, are rising disproportionately rapidly [38]. Unfortunately the health promotion and disease prevention activities of public health, including vaccinations, are not always easily accepted in societies, even though they significantly limit the health risks and the costs resulting from them – especially in old people [39], but also among the healthcare workers who take care of them [40]. It is however possible to lessen these negative results, at least to a limited extent, through actions aimed directly at the most cooperative parts of the society. These actions are crucial for the health and safety of elderly people and for delivering healthcare services to them affordably [41], minimizing the risk of critical staff shortages [40]. Loneliness among the elderly has been identified as one of

the main factors behind the increased consumption of healthcare services, which can jeopardize the tight budgets of states that have to deal with an ageing society [42]. Loneliness among older patients is associated with greater odds of both physician visits and hospitalization [43]. Practically all elderly people in Poland consume at least one drug each day, and 40% consume more than three drugs daily; the most commonly used are anti-hypertensive drugs and painkillers; these latter are more likely consumed by elderly people who suffer from loneliness, often due to self-medication [44]. Polypharmacy, defined as the regular use of five or more drugs, is a common problem, and lonely elderly people are also more likely than other patient groups to fail to adhere to pharmacotherapeutic regimens [45].

Effective social support can improve the physical and mental health in elderly people suffering from loneliness, and can lessen the negative effects of perceived stress [23]. The positive effects of intergenerational bonds and emotional support for the well-being of the elderly is well documented, and thus it is necessary that the state introduce regulations to enable, strengthen, and reviving such bonds throughout society [46]. Senior cohousing communities, where the elderly live in their own apartments but participate together in activities and support each other, alleviate loneliness, but only to a limited degree [47]. One systemic attempt to address this is day care centers that help community dwelling elderly people to avoid loneliness by providing holistic care while at the same time reducing the burden of regular caregivers [48]. Another such effort involves specialized elderly-care nurses, whose role is to provide holistic nursing care to the elderly in various settings – including home care services, aged care residences, nursing homes and hospitals, and also to advocate in local communities for the introduction of healthy ageing patterns and acceptance of respective sociocultural paradigms, leading to a change that enables improved care of the elderly through local support resulting from an increase in community bonds, including personal friendships and spiritual or religious groups involvement [49]. Nurses in primary healthcare are among the most appropriate agents for conducting and coordinating holistic interventions themselves or for mentoring other agents with lower technical and relational competence. These can help to empower elderly patients who willingly live in the community, limiting loneliness; this contrasts with more typical forms of support that merely extend to keeping company or helping with household chores, which are known to be less effective [50]. Taking into account the already limited staff numbers in healthcare systems, much hope is raised by emerging technology-based approaches, including information communication technology (ICT) [51, 52], especially in dealing with the problem of loneliness among single-person elderly households. These include artificial intelligence (AI) speaker systems, which are seeing increasing acceptance with recent improvements [53]. Promising results have also been reported on the use of robots and virtual reality in creating, maintaining and strengthening social relationships for elderly people in hospitals [54, 55].

Conclusions

Loneliness among elderly people is becoming a serious public health problem in modern atomized, ageing societies. This thus demands urgent action from the Polish state, aimed at providing the elderly with organized social support in order to adequately protect their health and wellbeing. Currently, different levels of the health system, including primary care physicians, are forced to deal with the increasing fallout of loneliness, which presents in the form of physical and mental illnesses, as well as psychosomatic ailments.

Source of funding: This work was funded from the authors' own resources.

Conflicts of interest: The authors declare no conflicts of interest.

References

- Leszko M, Zając-Lamparska L, Trempala J. Aging in Poland. *Gerontologist* 2015; 55(5): 707–715, doi: 10.1093/geront/gnu171.
- Wróblewska I, Zborowska I, Dąbek A, et al. Health status, health behaviors, and the ability to perform everyday activities in Poles aged ≥ 65 years staying in their home environment. *Clin Interv Aging* 2018; 13: 355–363, doi: 10.2147/CIA.S152456.
- Pobrotyn P, Pasieczna A, Diakowska D, et al. Evaluation of Frailty Syndrome and Adherence to Recommendations in Elderly Patients with Hypertension. *J Clin Med* 2021; 10: 3771, doi: 10.3390/jcm10173771.
- Trnka J, Gęsicki M, Susło R, et al. Death as a result of violent asphyxia in autopsy reports. *Adv Exp Med Biol* 2013; 788: 413–416, doi: 10.1007/978-94-007-6627-3_56.
- Di Fazio N, Morena D, Delogu G, et al. Mental Health Consequences of COVID-19 Pandemic Period in the European Population: An Institutional Challenge. *Int J Environ Res Public Health* 2022; 19(15): 9347, doi: 10.3390/ijerph19159347.
- Ghose B, Huang R, Etowa J, et al. Social Participation as a Predictor of Morbid Thoughts and Suicidal Ideation among the Elderly Population: A Cross-Sectional Study on Four Low-Middle-Income Countries. *Psychiatr Int* 2021; 2(2): 169–179, doi: 10.3390/psychiatryint2020013.
- Yang H, Jin J. Shared Destiny in the Digital Era: Sensation Seeking, Loneliness, and Excessive Internet Use among Middle-Aged and Older Adults in Mainland China. *Int J Environ Res Public Health* 2022; 19(21): 13766, doi: 10.3390/ijerph192113766.
- Site A, Vasudevan S, Afolaranmi SO, et al. A Machine-Learning-Based Analysis of the Relationships between Loneliness Metrics and Mobility Patterns for Elderly. *Sensors* 2022; 22(13): 4946, doi: 10.3390/s22134946.
- Liu G, Li S, Kong F. Association between Sense of Belonging and Loneliness among the Migrant Elderly Following Children in Jinan, Shandong Province, China: The Moderating Effect of Migration Pattern. *Int J Environ Res Public Health* 2022; 19(7): 4396, doi: 10.3390/ijerph19074396.
- Wright SL, Silard AG. Loneliness in Young Adult Workers. *Int J Environ Res Public Health* 2022; 19(21): 14462, doi: 10.3390/ijerph192114462.
- Ibáñez-del Valle V, Corchón S, Zaharia G, et al. Social and Emotional Loneliness in Older Community Dwelling-Individuals: The Role of Socio-Demographics. *International Journal of Environmental Research and Public Health* 2022; 19(24): 16622, doi: 10.3390/ijerph192416622.
- Hou Y, Cai C, Tang H, et al. Sexual Behavior and Perceived Loneliness in Elderly People Living with HIV in China during the COVID-19 Pandemic. *Int J Environ Res Public Health* 2023; 20(3): 2714, doi: 10.3390/ijerph20032714.
- Canedo-García A, García-Sánchez J-N, Díaz-Prieto C, et al. Evaluation of the Benefits, Satisfaction, and Limitations of Intergenerational Face-to-Face Activities: A General Population Survey in Spain. *Int J Environ Res Public Health* 2021; 18(18): 9683, doi: 10.3390/ijerph18189683.
- Needell NJ, Mehta-Naik N. Is Pet Ownership Helpful in Reducing the Risk and Severity of Geriatric Depression? *Geriatrics* 2016; 1(4): 24, doi: 10.3390/geriatrics1040024.
- You H, Wang Y, Xiao LD, et al. Prevalence of and Factors Associated with Negative Psychological Symptoms among Elderly Widows Living Alone in a Chinese Remote Sample: A Cross-Sectional Study. *Int J Environ Res Public Health* 2023; 20(1): 264, doi: 10.3390/ijerph20010264.
- Luo Y, Wu X, Liao L, et al. Children's Filial Piety Changes Life Satisfaction of the Left-Behind Elderly in Rural Areas in China? *Int J Environ Res Public Health* 2022; 19(8): 4658, doi: 10.3390/ijerph19084658.
- Donizzetti AR, Lagacé M. COVID-19 and the Elderly's Mental Illness: The Role of Risk Perception, Social Isolation, Loneliness and Ageism. *Int J Environ Res Public Health* 2022; 19(8): 4513, doi: 10.3390/ijerph19084513.
- Dekker MR, Frielink N, Hendriks AHC, et al. The General Public's Perceptions of How the COVID-19 Pandemic Has Impacted the Elderly and Individuals with Intellectual Disabilities. *Int J Environ Res Public Health* 2022; 19(5): 2855, doi: 10.3390/ijerph19052855.
- Rodríguez-Rodríguez V, Rojo-Perez F, Perez de Arenaza Escribano C, et al. The Impact of COVID-19 on Nursing Homes: Study Design and Population Description. *Int J Environ Res Public Health* 2022; 19(24): 16629, doi: 10.3390/ijerph192416629.
- Sørbye LW, Grue EV, Hogeveen S. Before the COVID-Vaccine – Vulnerable Elderly in Homecare. *Nurs Rep* 2022; 12(2): 270–280, doi: 10.3390/nursrep12020027.
- Crespo-Martín A, Palacios-Ceña D, Huertas-Hoyas E, et al. Emotional Impact and Perception of Support in Nursing Home Residents during the COVID-19 Lockdown: A Qualitative Study. *Int J Environ Res Public Health* 2022; 19(23): 15712, doi: 10.3390/ijerph192315712.
- Delgado-Losada ML, Bouhaben J, Arroyo-Pardo E, et al. Loneliness, Depression, and Genetics in the Elderly: Prognostic Factors of a Worse Health Condition? *Int J Environ Res Public Health* 2022; 19(23): 15456, doi: 10.3390/ijerph192315456.
- Chu H-Y, Chan H-S. Loneliness and Social Support among the Middle-Aged and Elderly People with Visual Impairment. *Int J Environ Res Public Health* 2022; 19(21): 14600, doi: 10.3390/ijerph192114600.
- Song J, Wu H, Lan H, et al. The Influence of Disease Status on Loneliness of the Elderly: Evidence from Rural China. *Int J Environ Res Public Health* 2022; 19(5): 3023, doi: 10.3390/ijerph19053023.
- Vespa A, Spatuzzi R, Fabbietti P, et al. Association between Sense of Loneliness and Quality of Life in Older Adults with Multimorbidity. *Int J Environ Res Public Health* 2023; 20(3): 2615, doi: 10.3390/ijerph20032615.
- Lim YM, Baek J, Lee S, et al. Association between Loneliness and Depression among Community-Dwelling Older Women Living Alone in South Korea: The Mediating Effects of Subjective Physical Health, Resilience, and Social Support. *Int J Environ Res Public Health* 2022; 19(15): 9246, doi: 10.3390/ijerph19159246.
- Fan S, Yang Y. How Does Internet Use Improve Mental Health among Middle-Aged and Elderly People in Rural Areas in China? A Quasi-Natural Experiment Based on the China Health and Retirement Longitudinal Study (CHARLS). *Int J Environ Res Public Health* 2022; 19(20): 13332, doi: 10.3390/ijerph192013332.
- Guo Z, Zhu B. Does Mobile Internet Use Affect the Loneliness of Older Chinese Adults? An Instrumental Variable Quantile Analysis. *Int J Environ Res Public Health* 2022; 19(9): 5575, doi: 10.3390/ijerph19095575.
- Susło R, Paplicki M, Dopierała K, et al. Fostering digital literacy in the elderly as a means to secure their health needs and human rights in the reality of the twenty-first century. *Fam Med Prim Care Rev* 2018; 20(3): 271–275, doi: 10.5114/fmPCR.2018.78273.
- Tian H, Wang Y. Mobile Phone Addiction and Sleep Quality among Older People: The Mediating Roles of Depression and Loneliness. *Behav Sci* 2023; 13(2): 153, doi: 10.3390/bs13020153.
- Bacărea A, Bacărea VC, Buicu F, et al. Emotional Eating Sustainability in Romania – A Questionnaire-Based Study. *Sustainability* 2023; 15(4): 2895, doi: 10.3390/su15042895.
- Krzywińska-Siemaszko R, Deskur-Śmielecka E, Kaluźniak-Szymanowska A, et al. Socioeconomic Risk Factors of Poor Nutritional Status in Polish Elderly Population: The Results of PolSenior2 Study. *Nutrients* 2021; 13(12): 4388, doi: 10.3390/nu13124388.

33. Cristina NM, Lucia D. Nutrition and Healthy Aging: Prevention and Treatment of Gastrointestinal Diseases. *Nutrients* 2021; 13(12): 4337, doi: 10.3390/nu13124337.
34. Besora-Moreno M, Llauradó E, Tarro L, et al. Social and Economic Factors and Malnutrition or the Risk of Malnutrition in the Elderly: A Systematic Review and Meta-Analysis of Observational Studies. *Nutrients* 2020; 12(3): 737, doi: 10.3390/nu12030737.
35. Liu C-C, Lin Y-T, Cheng K-C, et al. Predictors of Depression Level among Community-Dwelling Elderly Persons. *Int J Environ Res Public Health* 2022; 19(15): 9414, doi: 10.3390/ijerph19159414.
36. Paplicki M, Susło R, Dopierała K, et al. Systemic aspects of securing the health safety of the elderly. *Fam Med Prim Care Rev* 2018; 20(3): 267–270, doi: 10.5114/fmpcr.2018.78272.
37. Susło R, Trnka J, Drobniak J. Current threats to medical data security in family doctors' practices. *Fam Med Prim Care Rev* 2017; 19(3): 313–318, doi: 10.5114/fmpcr.2017.69297.
38. Pobrotyn P, Susło R, Witczak I, et al. An analysis of the costs of treating aged patients in a large clinical hospital in Poland under the pressure of recent demographic trends. *Arch Med Sci* 2020; 16(3): 666–671, doi: 10.5114/aoms.2018.81132.
39. Paplicki M, Susło R, Najjar N, et al. Conflict of individual freedom and community health safety: legal conditions on mandatory vaccinations and changes in the judicial approach in the case of avoidance. *Fam Med Prim Care Rev* 2018; 20(4): 389–395, doi: 10.5114/fmpcr.2018.80081.
40. Drobniak J, Susło R, Pobrotyn P, et al. COVID-19 among Healthcare Workers in the University Clinical Hospital in Wrocław, Poland. *Int J Environ Res Public Health* 2021; 18: 5600, doi: 10.3390/ijerph18115600.
41. Susło R, Pobrotyn P, Brydak L, et al. Seasonal Influenza and Low Flu Vaccination Coverage as Important Factors Modifying the Costs and Availability of Hospital Services in Poland: A Retrospective Comparative Study. *Int J Environ Res Public Health* 2021; 18: 5173, doi: 10.3390/ijerph18105173.
42. Chen Y, Li L, Tan Z, et al. Effects of Social Support and Loneliness on the Irrational Consumption Tendencies of Healthcare Products among the Elderly: A Structural Equation Model. *International Journal of Environmental Research and Public Health* 2022; 19(21): 14404, doi: 10.3390/ijerph192114404.
43. Zhang J, Xu L, Li J, et al. Loneliness and Health Service Utilization among the Rural Elderly in Shandong, China: A Cross-Sectional Study. *Int J Environ Res Public Health* 2018; 15(7): 1468, doi: 10.3390/ijerph15071468.
44. Pietraszek A, Agrawal S, Drózd M, et al. Sociodemographic and Health-Related Factors Influencing Drug Intake among the Elderly Population. *Int J Environ Res Public Health* 2022; 19(14): 8766, doi: 10.3390/ijerph19148766.
45. Sturm N, Stolz R, Schalhorn F, et al. Self-Efficacy, Social Activity, and Spirituality in the Care of Elderly Patients with Polypharmacy in Germany – A Multicentric Cross-Sectional Study within the HoPES3 Trial. *Healthcare* 2021; 9(10): 1312, doi: 10.3390/healthcare9101312.
46. Yang M, Wang H, Yao J. Relationship between Intergenerational Emotional Support and Subjective Well-Being among Elderly Migrants in China: The Mediating Role of Loneliness and Self-Esteem. *Int J Environ Res Public Health* 2022; 19(21): 14567, doi: 10.3390/ijerph192114567.
47. Rusinovic K, Bochove M, Sande J. Senior Co-Housing in the Netherlands: Benefits and Drawbacks for Its Residents. *Int J Environ Res Public Health* 2019; 16(19): 3776, doi: 10.3390/ijerph16193776.
48. Mazurek J, Szcześniak D, Trypka E, et al. Needs of Older People Attending Day Care Centres in Poland. *Healthcare* 2020; 8(3): 310, doi: 10.3390/healthcare8030310.
49. Cheluvappa R, Selvendran S. Antipodean Perspectives – Aged Care Nursing and the Multifaceted Role of the Aged Care Nurse. *Nurs Rep* 2022; 12(3): 629–636, doi: 10.3390/nursrep12030629.
50. Hernández-Ascanio J, Ventura-Puertos PE, Rich-Ruiz M, et al. Conditions for Feasibility of a Multicomponent Intervention to Reduce Social Isolation and Loneliness in Noninstitutionalized Older Adults. *Healthcare* 2022; 10(6): 1104, doi: 10.3390/healthcare10061104.
51. Choi HK, Lee SH. Trends and Effectiveness of ICT Interventions for the Elderly to Reduce Loneliness: A Systematic Review. *Healthcare* 2021; 9(3): 293, doi: 10.3390/healthcare9030293.
52. Llorente-Barroso C, Kolotouchkina O, Mañas-Viniestra L. The Enabling Role of ICT to Mitigate the Negative Effects of Emotional and Social Loneliness of the Elderly during COVID-19 Pandemic. *Int J Environ Res Public Health* 2021; 18(8): 3923, doi: 10.3390/ijerph18083923.
53. Kim H, Hwang S, Kim J, et al. Toward Smart Communication Components: Recent Advances in Human and AI Speaker Interaction. *Electronics* 2022; 11(10): 1533, doi: 10.3390/electronics11101533.
54. Follmann A, Scholleman F, Arnolds A, et al. Reducing Loneliness in Stationary Geriatric Care with Robots and Virtual Encounters – A Contribution to the COVID-19 Pandemic. *Int J Environ Res Public Health* 2021; 18(9): 4846, doi: 10.3390/ijerph18094846.
55. Isabet B, Pino M, Lewis M, et al. Social Telepresence Robots: A Narrative Review of Experiments Involving Older Adults before and during the COVID-19 Pandemic. *Int J Environ Res Public Health* 2021; 18(7): 3597, doi: 10.3390/ijerph18073597.

Tables: 0

Figures: 0

References: 55

Received: 12.03.2023

Reviewed: 13.03.2023

Accepted: 14.03.2023

Address for correspondence:

Anna Susło, MD

Zespół Opieki Zdrowotnej w Bolesławcu

Szpital św. Łukasza w Bolesławcu

ul. Jeleniogórska 4

59-700 Bolesławiec

Polska

Tel.: +48 75 738-02-00

E-mail: anna.suslo@hotmail.com