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Influence of the health status and other relevant factors on the quality of life of elderly people

Uticaj zdravstvenog statusa i drugih relevantnih faktora na kvalitet života starijih ljudi

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Abstract

Background/Aim. The world population is aging rapidly. It has become a challenge to meet the vital needs of the elderly in big cities. The aim of the study was to investigate the influence of the health status as well as other relevant factors on the perceived quality of life in aged people in Belgrade, Serbia. **Method.** The survey was conducted in October 2019 on a representative sample of 764 people (39.9% male and 60.1% female) aged between 65 and 79 years (mean ± standard deviation = 72.68 ± 7.11 years) living in Belgrade. In the research, a questionnaire developed on the basis of the World Health Organization (WHO) methodology for age-friendly cities was used, aimed to explore 11 factors important for the elderly. **Results.** Factor of physical accessibility of community and socioeconomic factors were highly significant [χ^2 (df = 3, n = 764) = 238.905; $p < 0.001$ and χ^2 (df = 3, n = 764) = 207.571; $p < 0.001$, respectively] and explained 39.4% and 35% of variance of perceived quality of life, respectively. Social environment explained 24.6% of variance of perceived quality of life [χ^2 (df = 4, n = 764) = 140.242; $p < 0.001$]. Health status had greatest explanatory power regarding perceived quality of life and explained as much as 46.7% of variance [χ^2 (df = 8, n = 764) = 292.083; $p < 0.001$]. When the unique impact of health status on quality of life was analyzed, when other variables were controlled, health status explained 21.6% of the variance in addition to the variance explained by physical accessibility, socioeconomic status, and social environment. **Conclusion.** Although health status has the greatest impact on the perceived quality of life of older people, interventions on other life important domains such as physical accessibility, socioeconomic status, and social environment could have a positive impact on the perceived quality of life where health status alone could not be improved.

Key words:
aged; health services accessibility; health status; social environment; socioeconomic factors; surveys and questionnaires; quality of life.

Apstrakt

Uvod/Cilj. Svetska populacija ubrzano stari. Pravi izazov je izaći u susret najvažnijim potrebama starih ljudi u velikim gradovima. Cilj rada bio je da se istraži uticaj zdravstvenog stanja kao i drugih bitnih faktora koji doprinose kvalitetu života starijih ljudi u Beogradu, Srbija. **Metode.** Istraživanje je sprovedeno u oktobru 2019. godine na reprezentativnom uzorku koji su činile 764 osobe starosti između 65 do 79 godina života (srednja vrednost ± standardna devijacija = 72,68 ± 7,11 godina), (39,9% muškog i 60,1% ženskog pola) koje žive na teritoriji Beograda. U istraživanju je korišćen upitnik formiran na osnovu metodologije Svetske zdravstvene organizacije (SZO) za gradove prilagođene starijim osobama (*age-friendly cities*), a cilj je bio da se istraži 11 faktora koji su važni za pomenutu populaciju. **Rezultati.** Faktor fizičke dostupnosti zajednice i socio-ekonomski faktori bili su izuzetno značajni [χ^2 (df = 3, n = 764) = 238,905; $p < 0,001$, odnosno χ^2 (df = 3, n = 764) = 207,571; $p < 0,001$] i objasnili su 39,4%, odnosno 35% varijanse perceptivnog kvaliteta života. Socijalno okruženje je objasnilo 24,6% varijanse perceptivnog kvaliteta života [χ^2 (df = 4, n = 764) = 140,242; $p < 0,001$]. Zdravstveni status je imao najznačajniji efekat u odnosu na percepciju kvaliteta života i objasnio je čak 46,7% varijanse [χ^2 (df = 8, n = 764) = 292,083; $p < 0,001$]. Kada se analizirao jedinstveni uticaj zdravstvenog stanja na kvalitet života, uz istovremenu kontrolu drugih varijabli, zdravstveni status je objasnio

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21,6% varijanse, uz onu koja se objašnjava fizičkom dostupnošću, socijalno-ekonomskim statusom i socijalnim okruženjem. **Zaključak.** Iako je zdravstveni status imao najveći uticaj na percepciju kvaliteta života starijih ljudi, intervencije na drugim životno važnim poljima kao što su fizička dostupnost, socijalno-ekonomski status i socijalno okruženje mogu imati pozitivan uticaj na percipirani kvalitet života tamo gde sam zdravstveni status starijih ljudi ne može biti poboljšan.

Ključne reči:
stare osobe; zdravstvene službe, dostupnost; zdravstveno stanje; socijalno okruženje; socijalno-ekonomski faktori; ankete i upitnici; kvalitet života.

Introduction

Acceleration of global population aging is one of the most important challenges the world is facing [1].

Meeting the increased need for health care services for the aging population has a significant economic impact on society [2]. Healthy aging and preserving the quality of life of the older population is one of the most important means of keeping rising costs bearable. World Health Organization (WHO) promotes healthy aging through maintaining the functional ability of the older people [3]. It depends mostly on health status but also on other domains which influence older people's quality of life as proposed in WHO methodology for assessing age-friendliness of the cities [4]. In the global WHO network for age-friendly cities, there are currently 760 cities, local communities, and other initiatives in 39 countries with more than 213 million older people living in it [5]. Ensuring mobility through different domains is of crucial importance for older people. Besides, older people can decide whether they want to stay in their homes as long as possible or be placed in the institutions such as elderly homes. Given the chance to decide, majority of them choose to stay in their own environment [6]. Living conditions, often, could be worse for the elderly, because of the necessity for adjustment of living space, and these interventions could be costly [7]. However, recent studies showed that there were no significant systematic differences in the WHO aging-friendly city domains in developed and developing countries, while physical accessibility, service proximity, affordability, and inclusiveness were the most important features related to healthy aging and quality of life [8].

The quality of life could be best described as a statistical index that is based on various parameters, such as economic-related, health-related, and environmental-related [9]. Poor social networks [10] and additional contributing features such as poor living conditions, poverty, and poor social relations [11] underwrite deterioration of quality of life. There is a well-established positive correlation between the social participation of the elderly and active healthy aging [12]. Older people actively involved in community events are less likely to ask for health services because of health problems or depression. Maintaining or even increasing social participation in the community could be seen as a protective factor against the harmful effect in different life situations such as functional impairment, disability, or even lack of family support. Therefore, social participation has a significant impact together with physical and mental health and the overall quality of life of older people [13]. In real-life circumstances through, participation in social networks decreases with aging, especially among low-income elderly people and members of minority groups. In fact, the rate of social exclusion of the elderly is constantly growing. At the level of public policies, the problem of loneliness of the elderly is increasingly opening up.

Nevertheless, health status is considered the most important factor that influences older persons' quality of life. The more health problems older people face, the lower the subjective estimation of quality of life and social inclusion is [14]. Health status impact on quality of life could be considered not only by a direct impact but also by consequences poor health has on older people's mobility and physical accessibility, as well as socioeconomic and social environment. Thus, improving the health status of each individual contributes not only to the quality of life but also to other life domains of the elderly.

The aim of the study was to investigate the influence of the health status as well as other relevant factors on the perceived quality of life in aged people in Belgrade, Serbia.

Methods

A study was conducted on a representative sample of 764 elderly living in Belgrade, Serbia. Data were collected in October 2019. The questionnaire was filled in during interviews with the elderly in their homes which ensured the participation of the respondents with reduced functional efficacy. Interviews were conducted by trained professionals, and all participants gave formal consent to participate in the study. The questionnaire was developed specifically for the study, based on the methodology developed by WHO for assessing the age-friendliness of the cities. The questionnaire consisted of 63 items covering further areas: physical accessibility of community, accessibility of public transport, accessibility of public spaces and buildings, accessibility and quality of housing, availability of information, safety, participation in community, accessibility and quality of health and social services, socioeconomic status, health status, and perceived quality of life. In fact, the connection between the quality of life on the one and the community design recommended on the other side is of extreme importance for planning for the aging population [15].

Socioeconomic status was measured through three indicators, ability to pay communal expenses, afford heating when cold, and provide an adequate diet. Perceived quality of life was measured by the standard question: "How would you rate your quality of life?". Health status was measured through the subjective perception of health, functional efficacy, and presence of specific health problems. The validity

of the questionnaire was assessed, and it was adjusted through cognitive interviews with 20 elderly with different functional efficacy and tested on a sample of 100 elderly.

Statistical analysis was performed using Statistical Package for Social Science version 23. All variables are present using frequency (n) and percentage (%).The binary logistic regression method with all variables in the model was used to analyze the relationship between physical accessibility of community, socioeconomic status, social environment, and health status with quality of life. For each group of factors, a separate model was created. A *p*-value of 0.05 and less was considered to be statistically significant. The effect size was estimated using Nagelkerke R-Squared, while the goodness-of-fit model was assessed based on Hosmer-Lemeshow (H-L) test, although the H-L test is found biased except for small samples, as small departures from the proposed model are identified as significant. In this sense, R-Squared was used primarily when discussing results. Based on previous work, a sample larger than 500 provided adequate power of logistic regression [16] (differences within ± 0.5 for coefficients and differences within ± 0.02 for Nagelkerke R-Squared). In order to assess the unique contribution of health status to quality of life, hierarchical binary logistic regression was used where variables representing physical accessibility, socioeconomic status, and social environment were entered in the first block, and in the second step, health variables were entered.

Results

The study sample consisted of 764 elderly, among which 39.9% were men (n = 305) and 60.1% were woman (n = 459). The age of participants was in the range from 65 to 79 years, with an average (mean ± standard deviation) age of 72.68 ± 7.11 years. The educational structure showed that majority of the participants had unfinished or finished primary education (44.1%). A smaller number (39.6%) completed secondary education, while 16.3% had a university degree. More than half of the participants (53%) lived with a spouse, 12% were divorced or did not live with a spouse, and 35% were widowed. The pension was the main source of income for the majority of the participants; for 75.5%, it was an old-age pension, while 15.6% received family pension. A total of 7.4% of participants had some other kind of income, 0.64% still worked earning a salary, and 0.64% had social assistance as the main source of income, while 0.13% had no income at all. Range of monthly income between 30 and 50 thousand dinars received 32.2% of respondents and 12.2% had an income higher than 50 thousand dinars. Range from 20 to 30 thousand dinars is the amount that 30.64% of respondents received monthly, while 19.7% of participants got less than 20 thousand dinars. More than half of the participants (54.03%) could not meet monthly needs with their personal income. When it comes to poverty indicators, a quarter of participants (26%) were unable to cover communal expenses, while 11.9% could not provide heating, 13.4% adequate diet, and 27.4% could not buy the medication they needed. About one-quarter of the elderly faced inaccessible physical surroundings – 24.5% reported that the neighborhood is inaccessible, 20.9% that public transport is inaccessible, and 18.6% that public spaces and buildings are inaccessible. Elderly face significant barriers concerning participation in the social environment. Although the elderly participate in family events at least once every three to four months (71.6%), they are excluded from the cultural life of the community, where just 17.9% of the elderly reported that they have participated in a cultural event. Moreover, one-third of the elderly (36.1%) did not feel they belong to the community. Most of the elderly (89.9%) felt safe in the communities they live in. Regarding health status, 15.3% of elderly saw their health as very bad or bad, 54.1% as satisfactory, while 30.6% assessed their health as very good or good. In line with this, 11.1% reported that their health condition severely restricts their ability to perform daily activities, 48.4% reported that their ability to function is slightly impaired, while 40.4% reported that their health status does not restrict them in daily functioning. Types of impairments were measured by asking participants if they had total or partial impairment (Table 1). Regarding the quality of life, 74.2% of the elderly assessed their quality of life as good or very good and 25.8% as bad or very bad.

Table 1

Frequency of health difficulties

Health difficulties	Participants n (%)
Impairment	
vision	97 (12.7)
hearing	101 (13.2)
physical	253 (33.1)
Problems with memory and concentration	88 (11.5)
Psychological and emotional problems	54 (7.1)
Chronic pain	308 (40.3)

Model representing factor of physical accessibility of community was highly significant [χ^2 (df = 3, n = 764) = 238.905; $p < 0.001$] and explained 39.4% of variance of perceived quality of life, with significant H-L test [$\chi^2 = 92.022$; $p < 0.001$]. All factors had significant contribution to the model, where accessibility of public transport and objects and spaces was more significant than accessibility of neighborhood. Socioeconomic factors explained approximately the same amount of variance as physical accessibility of community, 35% [χ^2 (df = 3, n = 764) = 207.571; $p < 0.001$], with H-L test being not significant [$\chi^2 = 0.245$; $p = 0.885$]. The greatest negative influence on perceived quality of life had the inability to meet living expenses such as to pay bills. Social environment had somewhat less explanatory power than physical accessibility which contributed with 39.45% and socioeconomic status with 35% in explanation of variance, although it explained 24.6% of variance of perceived quality of life [χ^2 (df = 4, n = 764) = 140.242; $p < 0.001$], with significant H-L test [$\chi^2 = 67.804$; $p < 0.001$]. The two variables that were significant predictors of perceived quality of life were the sense of belonging to a community and inclusion in family life, while inclusion in cultural events and perceived safety were not connected to perceived quality of

Table 2

Analysis by groups of variables

Model	OR	95% CI (lower – upper)	*p*-value
Physical accessibility			
neighborhood	1.776	1.142–2.761	0.011
public transport	6.728	4.295–10.540	0.000
public objects and spaces	5.972	3.740–9.538	0.000
Socioeconomic			
communal expenses	5.076	3.318–7.765	0.000
heating	4.304	2.144–8.639	0.000
food	2.257	1.195–4.263	0.012
Social environment			
belonging to community	3.813	2.647–5.490	0.000
inclusion in cultural events	1.524	0.871–2.667	0.140
inclusion in family life	4.105	2.816–5.983	0.000
safety	0.872	0.478–1.590	0.655
Health			
self-perceived health status (bad: satisfactory)	6.820	3.647–12.754	0.000
self-perceived health status (bad: good)	6.951	4.294–37.243	0.000
vision impairment	12.645	3.270–14.775	0.000
hearing impairment	0.689	0.303–1.569	0.375
physical impairment	2.388	1.375–4.147	0.002
problems with memory and concentration	0.236	0.111–0.500	0.000
psychological and emotional problems	0.048	0.018–0.132	0.000
chronic pain	1.598	1.010–2.529	0.045
functional efficacy (significant constraints: mild constraints)	10.322	4.218–25.257	0.000
functional efficacy (significant constraints: no constraints)	70.141	24.656–199.532	0.000

OR – odds ratio; CI – confidence interval.

Table 3

Results of hierarchical binary logistic regression

Factors	χ^2	df	*p*-value	Nagelkerke R-Squared
Block 1 (physical accessibility, socioeconomic, social environment)	370.057	10	0.000	0.564
Block 2 (health status)	208.185	10	0.000	0.216
Block 3 (public objects and spaces)	578.242	20	0.000	0.780

df – degree of freedom.

life. Health status had greatest explanatory power regarding perceived quality of life and explained as much as 46.7% of variance [χ^2 (df = 8, n = 764) = 292.083; $p < 0.001$], with H-L test being significant [χ^2 = 52.900; $p < 0.001$]. The most significant predictors of quality of life were functional efficacy and psychological and emotional problems. It was unexpected that vision impairment and physical impairment had a positive relation to the quality of life (Table 2).

If we analyze the unique impact of health status on quality of life, when other variables are controlled, it can be concluded that health status explained 21.6% of the variance in addition to the variance explained by physical accessibility, socioeconomic status, and social environment (Table 3).

Discussion

Population aging remains one of the biggest challenges we are facing, and it will remain the same in the decades to come. The global share of the population over the age of 65 in the total world population in 2019 was 9%, while it is estimated that it will be 23% in 2050. If the number of people older than 80 is considered, the acceleration of aging is even greater. While it is estimated that there were 54 million people over 80 years in 1990, in 2019, their number was 143 million, and it is expected that in 2100 there will be 881 million people older than 80 [17]. In Serbia, in 2019, 23.06% of the population was older than 65 years. The average age of the population has steadily increased over the last 70 and more years, and in 2019, it was 43.3 years. The aging index of the population, whose value does not exceed 20 index points, indicates a distinctly young population and over 40 to the old population. While the aging index of the population was 22.42, in 1950 in Serbia, in 2019, it was 144.05 [18].

Maintaining functional ability in older age and quality of life remains a strong starting point for aging in place in an older person's environment. Different factors influence the quality of life of older adults. Our study shows that 25.8% of the older population in Belgrade evaluates their quality of life as bad or very bad. Physical inaccessibility was reported by 24.5% of respondents when asked to evaluate their immediate neighborhood, 20.9% reported public transport, and 18.6% evaluated public spaces and buildings as inaccessible. However, accessibility is not commonly considered an obstacle in obtaining health and social care services, but it is an

important factor for maintaining physical and social activities aimed at preserving physical and mental health [19]. It is worrying that almost one-third of the older population (29.9%) finds its own socioeconomic status bad or very bad, with a significant number of elderly unable to cover basic needs like heating, living costs, or diet. Although such status has an undoubted impact on quality of life [20], there is no explicit proof of whether greater longevity has amplified the functional incapacity of older people and the number of dependents [21]. The social environment stays one of the key components of healthy aging and good quality of life in older age. In this area elderly faces significant barriers. Although 71.6% of them meet with their family at least once a month, they do not participate in cultural events (82.1%) and more than one-third of them (36.1%) feel rejected by the community. Participation in social events significantly reduces the risk of functional decline, just like frequent participation in family events [22]. Finally, among older people in Belgrade, the majority (84.7%) find their health status good, very good, or at least satisfactory, but even 15.3% find their health status bad or very bad. Even 11.1% report that they are severely restricted from performing daily activities important for their functional ability, and almost half of the older population (48.4%) reports some form of restriction, at least a slight one.

Studies show that health status is the most important factor that influences the quality of life of the elderly [23]. Results from our study are in line with these findings and clearly show that health status has the greatest explanatory power concerning the perceived quality of life and explains as much as 46.7% of the variance. Functional efficacy and psychological and emotional problems remain the greatest significant predictors of quality of life. Quite unexpectedly, our results show that vision impairment and physical impairment have a positive relation with the quality of life, which could be explained by the greater support these people acquire from their families. Other studies showed different findings pointing that visual and hearing impairment had a negative influence on the quality of life [24, 25].

However, when the unique impact of health status on quality of life is analyzed, when other variables are controlled, health status explains 21.6% of the variance in addition to the variance explained by physical accessibility, socioeconomic status, and social environment. These three domains are very important for their capacity to reduce negative health status impact on the quality of life. Physical accessibility of community explains 39.4% of the variance of perceived quality of life, socioeconomic factors describe 35%, while the social environment has less explanatory power with 24.6% of the variance of perceived quality of life.

Conclusion

While health status remains the key factor for good quality of life in older age, contributing features, such as physical accessibility, socioeconomic status, and social environment, could have a significant potential for reducing its negative influence on the quality of life. Health status also remains an important field for different types of interventions when health status solely could not be improved.

REFERENCES

1. *Lutz W, Sanderson W, Scherbov S*. The coming acceleration of global population ageing. Nature 2008; 451(7179): 716–9.
2. *Wang N, Gao W, Ma M, Shan L, Fu X, Sun T*, et al. The medical insurance system's weakness to provide economic protection for vulnerable citizens in China: A five-year longitudinal study. Arch Gerontol Geriatr 2021; 92: 104227.
3. *Beard JR, Officer A, de Carvalho IA, Sadana R, Pot AM, Michel JP*, et al. The World report on ageing and health: a policy framework for healthy ageing. Lancet 2016; 387(10033): 2145–54.
4. *World Health Organization*. Global age-friendly cities: A guide. Geneva: World Health Organization; 2007.
5. *World Health Organization*. The Global Network for Age-friendly Cities and Communities: Looking back over the last decade, looking forward to the next. Geneva: World Health Organization; 2018.
6. *Wiles JL, Leibing A, Guberman N, Reeve J, Allen RE*. The meaning of "aging in place" to older people. Gerontologist 2012; 52(3): 357–66.
7. *Newman S*. The living conditions of elderly Americans. Gerontologist 2003; 43(1): 99–109.
8. *Plouffe L, Kalache A*. Towards global age-friendly cities: determining urban features that promote active aging. J Urban Health 2010; 87(5): 733–9.
9. *Sosnowski R, Kulpa M, Ziętalewicz U, Wolski JK, Nowakowski R, Bakuła R*, et al. Basic issues concerning health-related quality of life. Cent European J Urol 2017; 70(2): 206–11.
10. *Gallicchio L, Hoffman SC, Helzlsouer KJ*. The relationship between gender, social support, and health-related quality of life in a community-based study in Washington County, Maryland. Qual Life Res 2007; 16(5): 777–86.
11. *Bowling A*. Ageing well: Quality of life in old age. New York, NY: McGraw-Hill; 2005.
12. *Novek S, Menec V, Tran T, Bell S*. Exploring the impacts of senior centres on older adults. Winnipeg, MB: Centre on Aging; 2013.
13. *Glei DA, Landau DA, Goldman N, Chuang YL, Rodríguez G, Weinstein M*. Participating in social activities helps preserve cognitive function: an analysis of a longitudinal, population-based study of the elderly. Int J Epidemiol 2005; 34(4): 864–71.
14. *Vesić Z, Perišić N, Jakšić I*. Factors of social inclusion of the elderly in Belgrade. Soc Rev 2019; 53(4): 1681–708. (Sebian)
15. *Fitzgerald KG, Caro FG*. An overview of age-friendly cities and communities around the world. J Aging Soc Policy 2014; 26(1–2): 1–8.
16. *Bujang MA, Sa'at N, Sidik TMITAB, Joo LC*. Sample Size Guidelines for Logistic Regression from Observational Studies with Large Population: Emphasis on the Accuracy Between Statistics and Parameters Based on Real Life Clinical Data. Malays J Med Sci 2018; 25(4): 122–30.
17. United Nations, Department of Economic and Social Affairs, Population Division (2019). World Population Prospects 2019: Highlights. 2019. ST/ESA/SER.A/423.
18. Statistical Office of the Republic of Serbia. Demographic Yearbook 2019. 2020. (Serbian)
19. *Green G*. Age-friendly cities of Europe. J Urban Health 2013; 90(1): 116–28.

20. *Huguet N, Kaplan MS, Feeny D*. Socioeconomic status and health-related quality of life among elderly people: results from the Joint Canada/United States Survey of Health. Soc Sci Med 2008; 66(4): 803–10.
21. *Hank K*. How "successful" do older Europeans age? Findings from SHARE. J Gerontol B Psychol Sci Soc Sci 2011; 66(2): 230–6.
22. *Gao M, Sa Z, Li Y, Zhang W, Tian D, Zhang S,* et al. Does social participation reduce the risk of functional disability among older adults in China? A survival analysis using the 2005–2011 waves of the CLHLS data. BMC Geriatr 2018; 18: 224.
23. *Aghamolaei T, Tavafian SS, Zare S*. Health related quality of life in elderly people living in Bandar Abbas, Iran: a population-based study. Acta Med Iran 2010; 48(3): 185–91.
24. *Ciorba A, Bianchini C, Pelucchi S, Pastore A*. The impact of hearing loss on the quality of life of elderly adults. Clin Interv Aging. 2012; 7: 159–63.
25. *Siira HJ, Falck AA, Kyngäs HA*. Health-related quality of life and related factors among older adults with visual impairments. Br J Vis Impair 2019; 37(3): 183–93.

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