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UTICAJ ZDRAVSTVENOG STATUSA I DRUGIH FAKTORA NA KVALITET ŽIVOTA STARIJIH LJUDI

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Abstract

**Introduction/Aim:** Aim of the study was to investigate influence of the health status as well as other contributing factors on perceived quality of life of the older people in Belgrade.

**Methods:** The survey was conducted in October 2019 on a representative sample of 764 people aged between 65 and 79 years ($X = 72.68 \pm 7.11$), (39.9% male and 60.1% female) living in Belgrade. The research used a questionnaire developed on the basis of the World Health Organization methodology for age friendly cities, aimed to explore 11 areas important for the elderly.

**Results:** Factor of physical accessibility of community is highly significant [$\chi^2 (df = 3, n = 764) = 238.905; p < 0.001$] and explained 39.4% of variance of perceived quality of life, while socio-economic factors show the same amount of variance, 35.0% [$\chi^2 (df = 3, n = 764) = 207.571; p < 0.001$]. Social environment explains 24.6% of variance of perceived quality of life [$\chi^2 (df = 4, n = 764) = 140.242; p < 0.001$]. Health status has greatest explanatory power regarding perceived quality of life and explain as much as 46.7% of variance [$\chi^2 (df = 8, n = 764) = 292.083; p < 0.001$]. When unique impact of health status on quality of life is analyzed, when other variables are controlled, health status explains 21.6% of variance in addition to variance explained by physical accessibility, socio-economic status and social environment.

**Conclusion:** Although health status has the greatest impact on perceived quality of life of older people, interventions on other life important domains such as physical accessibility, socio-economic status and social environment could have positive impact on perceived quality of life where health status alone could not be improved.

**Keywords:** quality of life, elderly, health status, physical accessibility, social environment
Apstrakt

Uvod/cilj: Cilj studije bio je da se istraži uticaj zdravstvenog stanja kao i drugih faktora koji doprinose kvalitetu života starih ljudi u Beogradu.

Metod: Istraživanje je sprovedeno u oktobru 2019. godine na reprezentativnom uzorku koji su činile 764 osobe starosti između 65 do 79 godina života (X= 72,68 ± 7,11), (39,9% muškog i 60,1% ženskog pola) koje žive na teritoriji Beograda. U istraživanju je korišćen upitnik razvijen na osnovu metodologije Svetske zdravstvene organizacije namenjene gradovima prijateljima starih, u okviru koga je cilj bio da se istraže 11 područja čija je prilagođenost značajna za starije osobe.

Rezultati: Faktor fizičke dostupnosti zajednice je izuzetno značajan [χ² (df = 3, n = 764) = 238.905; p < 0.001] i objašnjava 39,4% varijanse perceptivnog kvaliteta života, dok socio-ekonomski faktori pokazuju sličnu varijansu, 35,0% [χ² (df = 3, n = 764) = 207.571; p < 0.001]. Socijalno okruženje objašnjava 24,6% varijanse perceptivnog kvaliteta života [χ² (df = 4, n = 764) = 140.242; p < 0.001]. Zdravstveni status ima najznačajniji efekat u odnosu na percepciju kvaliteta života i objašnjava čak 46,7% varijanse [χ² (df = 8, n = 764) = 292.083; p < 0.001]. Kada se analizira jedinstveni uticaj zdravstvenog stanja na kvalitet života, uz istovremenu kontrolu drugih varijabli, zdravstveni status objašnjava 21,6% varijanse, uz onu koja se objašnjava fizičkom dostupnošću, socijalno-ekonomskim statusom i socijalnim okruženjem.

Zaključak: Iako zdravstveni status ima najveći uticaj na percepciju kvaliteta života starih ljudi, intervencije na drugim životnim važnim domenima kao što su fizička dostupnost, socijalno-ekonomski status i socijalno okruženje mogu imati pozitivan uticaj na percipirani kvalitet života tamo gde sam zdravstveni status starih ljudi ne može biti poboljšan.

Ključne reči: kvalitet života, stariji, zdravstveni status, fizička dostupnost, socijalno okruženje
Introduction

Acceleration of aging is one of the most important challenges world is facing \cite{1}. Meeting increased need for health care services for aging population has significant economic impact for the society \cite{2}. Healthy aging and preserved quality of life of older population is one of the most important means for keeping rising costs bearable. World Health Organization promote healthy aging through maintains for older person functional ability \cite{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 \cite{4}. In 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 \cite{5}. Ensuring the mobility through different domains is of the crucial importance for older people. By that, older people have chance to decide if they want to stay in their homes as long as it is possible or to be placed into the institutions like elderly homes. Given chance to decide, the majority of them choose to stay in their own environment \cite{6}. Living conditions, often, could be worse for elderly, because of the necessity for adjustment of living space and that interventions could be costly \cite{7}. However, recent studies showed that there were no significant systematic differences in WHO aging friendly cities domains in developed and countries in development, while physical accessibility, service proximity, affordability and inclusiveness were the most important features related to healthy aging and quality of life \cite{8}.

Although the quality of life could be the best described as statistical index which is based on various parameters, like economic related, health related and environmental related \cite{9}. Poor social networks \cite{10} and additional contributing features such as poor living conditions, poverty and poor social relations \cite{11} underwrite deterioration in quality of life. There is well established positive correlation between social participation of elderly and active, healthy aging \cite{12}. Older people actively involved in community events are less likely to ask for health service because of health problems or depression. Maintaining or even increasing social participation in community could be seen as protective factor for the harmful effect in different life situations such as functional impairment, disability or even lack of family support. So, social participation has significant impact with physical and mental health and overall quality of life of older people \cite{13}. Despite that fact, reality is dissimilar. Social
networks and participation decrease with aging, especially with low-income elderly 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 to be the most important factor which influence older persons quality of life. If there are more health problems older people are faced to, they report lower subjective estimation of quality of life and social inclusion \[14\]. Though, health status impact on quality of life could be considered not only by direct impact, but also by consequences poor health has on older people’s mobility and physical accessibility, as well as socio-economic and social environment. Thus, not only improving health status of each individual contribute quality of life, but also improving other older person’s life domains.

**Methods**

A study was conducted on the representative sample of 764 elderly living in Belgrade. Data were collected in October 2019. The questionary was filed up during interviews with elderly in their homes which ensured participation of the persons with reduced functional efficacy. Interviews were conducted by trained professionals and all participants gave formal consent for participation in the study. Questionnaire was developed specifically for the study, based on the methodology developed by WHO for assessing age friendliness of the cities. Questionary 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, socio-economic status, health status and perceived quality of life. In fact, connection between quality of life from the one and community design recommended from the other, is of extreme importance for planning for an aging population \[15\].

Socio-economic status was measured through three indicators, ability to pay communal expense, to afford heating when it is cold and provide adequate diet. Perceived quality of life was measured by standard questions “How would you rate your quality of life”. Health status was measured through subjective health, functional efficacy and presence of specific
health problems. The validity of 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 (%). Binary logistic regression
method with all variables in the model was used for analysis of relationship between
physical accessibility of community, socio-economic status, social environment and health
status with quality of life. For each group of factors separate model was created. A p value
of 0.05 and less was considered to be statistically significant. Effect size was estimated
using Nagelkerke R Square, while goodness-of-fit model was assessed based on Hosmer–
Lemeshow test, although H-L test is found biased except for small samples, as small
departures from the proposed model is identified as significant. In this sense, R Square was
used primarily when discussing results. Based on previous work, sample larger than 500
provide 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 unique
contribution of health status to quality of life, hierarchical binary logistic regression was
used, where in first block variables representing physical accessibility, socio-economic
status and social environment were entered, and in second step health variables.

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 range from 65 to 79, with
average age 72.68 ± 7.11. Educational structure shows that majority of the participants had
unfinished or finished primary education, 44,12%. Smaller number of them, 39,60%,
completed secondary education, while 16.28% had university degree. More than half of the
participants (53%) lived with a spouse, 12% of them were divorced or did not live with a
spouse, and 35% of them were widowed. Pension was the main source of the income for
the majority of the participants, for 75.54% it was old-age pension, while family pension
received 15.62% of them. A total of 7.43% of participants had some other kind of income,
0.64% still worked earning salary, 0.64% had social assistance as main source of income,
while 0.13% had no income at all. Range of monthly income between 30 and 50 thousand
dinars received 32.18% of them, 12.18% had income in the amount higher than 50 thousand dinars. Range from 20 to 30 thousand dinars is amount that 30.64% of respondents received monthly, while 19.74% 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 were unable to cover communal expanses (26.0%), while 11.9% could not provide heating, 13.4% adequate diet and 27.38% could not buy the medication they needed. About ¼ of elderly are facing inaccessible physical surrounding – 24.5% report that neighborhood is not accessible, 20.9% that public transport is not accessible and 18.6% that public spaces and buildings are not accessible. Elderly faces significant barriers in regard to participation in social environment. Although ¾ of elderly participates in family events at least once a month (71.6%), they are excluded from cultural life of community, where just 17.9% of elderly reported that they have participated in a cultural event. Also 1/3 of elderly do not feel that they belong to community (36.1%). Most of elderly feel safe in communities they live (89.9%). In regard to health status 15.3% of elderly see their health as very bad or bad, 54.1% as satisfactory, while 30.6% assess their health as very good or good. In line with this, 11.1% report that their health condition severely restricts their ability to perform daily activities, 48.4% report that their ability to function is slightly impaired, while 40.4% report that their health status do not restrict them in daily functioning. Type of impairments were measured by asking participants if they had total or partial impairment (Table 1). In regard to quality of life, 74.2% of elderly assess their quality of life as good or very good, and 25.8% as bad or very bad.

Model representing factor of physical accessibility of community is highly significant $[\chi^2 (df = 3, n = 764) = 238.905; p < 0.001]$ and explained 39.4% of variance of perceived quality of life, with Hosmer–Lemeshow test significant $[\chi^2 = 92.022; p<.001]$. All factors have significant contribution to the model, where accessibility of public transport and objects and spaces is more significant than accessibility of neighborhood. Socio-economic factors explain approximately the same amount of variance as physical accessibility of community, 35.0% $[\chi^2 (df = 3, n = 764) = 207.571; p < 0.001]$, with Hosmer–Lemeshow test not significant $[\chi^2 = 0.245; p=.885]$. The greatest negative influence on perceived quality of live has inability to meet living expenses such as to pay bills. Social environment
has somewhat less explanatory power than physical accessibility and socio-economic status, although it explains 24.6% of variance of perceived quality of life $[\chi^2 (df = 4, n = 764) = 140.242; p < 0.001]$ (Figure 1), with Hosmer–Lemeshow test significant $[\chi^2 = 67.804; p<.001]$. The two variables that are significant predictors of perceived quality of life are sense of belonging to community and inclusion in family life, while inclusion in cultural events and perceived safety were not connected to perceived quality of life. Health status has greatest explanatory power regarding perceived quality of life and explain as much as 46.7% of variance $[\chi^2 (df = 8, n = 764) = 292.083; p < 0.001]$, with Hosmer–Lemeshow test significant $[\chi^2 = 52.900; p<.001]$. The most significant predictors of quality of life are functional efficacy and psychological and emotional problems. It is unexpected that vision impairment and physical impairment have positive relation with quality of life.

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

**Discussion**

Population aging remains one of the biggest challenges we are facing, and it will remain 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 is estimated that it will be 23% in 2050. If the number of people older than 80 is considered, acceleration of the aging is even greater. While it is estimated that there were 54 million of the 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 persons older than 80 [17]. In Serbia, in 2019, 23.06% of population were older than 65 years. Average age of population is steadily increase over 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, in Serbia, in 1950 was 22.42, in 2019 it was 144.05 [18].
Maintaining functional ability in older age and quality of life remains strong starting point for aging in place in older person’s environment. There are different factors which influence on quality of life of the older adults. Our study shows that 25.8% of older population in Belgrade evaluate their quality of life as bad or very bad. Physical inaccessibility report 24.5% when asked to evaluate their immediate neighborhood, 20.9% public transport, while 18.6% evaluate public spaces and building as not accessible. However, accessibility was not commonly considered as obstacle in obtaining health and social care services, but it is important factor for maintaining physical and social activities aimed to preserve physical and mental health \(^{19}\). It is worrying fact that almost third older population (29.9%) find their own socio-economic status bad or very bad, with significant number who are not able to cover basic needs like heating, living costs or diet. Although such status has undoubted impact on quality of life \(^{20}\) there is no explicit proof on whether greater longevity has amplified the functional incapacity of older people and the number of dependents \(^{21}\). Social environment stays one of the key components of the healthy aging and good quality of life in older age. In this area elderly faces significant barriers. Although, 71.6% of them have meeting with family at least once in month, they do not participate in culture events (82.1%) and more than third of them they feel rejected from community (36.1%). Participation in social events significantly reduce risk of functional decline, just like frequent participation in family events \(^{22}\). Finally, older people in Belgrade in majority find their health status as good, very good or at least satisfactory (84.7%), but even 15.3% find their health status as bad or very bad. Even 11.1% reports that they are severe restricted from performing daily activities important for functional ability and some form of restriction, at least slight one, reports almost half of older population (48.4%).

Studies shows that health status was the most important factor which influence on elderly quality of life \(^{23}\). Results from our study are in the line with these findings and clearly shows that health status has greatest explanatory power concerning perceived quality of life and explain as much as 46.7% of variance and the greatest significant predictors of quality of life remains functional efficacy and psychological and emotional problems. Quite unexpected, our results show that vision impairment and physical impairment have positive relation with quality of life which could be explained with greater support this people.
acquire from their families. Other studies showed different findings pointing that visual and hearing impairment had negative influence on quality of life \[24, 25\]. However, when unique impact of health status on quality of life is analyzed, when other variables are controlled, health status explains 21.6% of variance in addition to variance explained by physical accessibility, socio-economic status and social environment. These three domains are very important for its capacity to reduce negative health status impact on quality of life. Physical accessibility of community explains 39.4% of variance of perceived quality of life, socio-economic factors describe 35.0%, while social environment has less explanatory power with 24.6% of 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, socio-economic status and social environment could have the significant potential for reducing of its negative influence on quality of life and remains important filed for different types of interventions, when health status solely could not be improved.
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Table 1. Frequency of impairments

| Impairment                                      | n  | %   |
|-------------------------------------------------|----|-----|
| Vision impairment                               | 97 | 12.7|
| Hearing impairment                              | 101| 13.2|
| Physical impairment                             | 253| 33.1|
| Problems with memory and concentration          | 88 | 11.5|
| Psychological and emotional problems            | 54 | 7.1 |
| Chronic pain                                    | 308| 40.3|
Table 2. Analysis by groups of variables

| Factors                                              | OR  | 95% CI          | P   |
|------------------------------------------------------|-----|-----------------|-----|
| **Model: Physical accessibility**                    |     |                 |     |
| Neighborhood                                         | 1.776 | 1.142 - 2.761   | .011 |
| Public transport                                     | 6.728 | 4.295 - 10.540  | .000 |
| Public objects and spaces                            | 5.972 | 3.740 - 9.538   | .000 |
| **Model: Socio-economic**                            |     |                 |     |
| Communal expanses                                    | 5.076 | 3.318 - 7.765   | .000 |
| Heating                                              | 4.304 | 2.144 - 8.639   | .000 |
| Food                                                 | 2.257 | 1.195 - 4.263   | .012 |
| **Model: Social environment**                        |     |                 |     |
| Belonging to community                               | 3.813 | 2.647 - 5.490   | .000 |
| Inclusion in cultural events                         | 1.524 | 0.871 - 2.667   | .140 |
| Inclusion in family life                             | 4.105 | 2.816 - 5.983   | .000 |
| Safety                                               | 0.872 | 0.478 - 1.590   | .655 |
| **Model: Health**                                    |     |                 |     |
| Self-perceived health status (bad: satisfactory)     | 6.820 | 3.647 - 12.754  | .000 |
| Self-perceived health status (bad: good)             | 6.951 | 4.294 - 37.243  | .000 |
| Vision impairment                                    | 12.645 | 3.270 - 14.775 | .000 |
| Hearing impairment                                   | .689  | .303 - 1.569    | .375 |
| Physical impairment                                  | 2.388 | 1.375 - 4.147   | .002 |
| Problems with memory and concentration               | .236  | .111 - .500     | .000 |
| Psychological and emotional problems                 | .048  | .018 - .132     | .000 |
| Chronic pain                                         | 1.598 | 1.010 - 2.529   | .045 |
| Functional efficacy (significant)                    | 10.322 | 4.218 - 25.257  | .000 |
| Factors                                    | Chi-square | df. | Sig.   | Nagelkerke R Square |
|-------------------------------------------|------------|-----|--------|---------------------|
| Block 1 (physical accessibility, socio-economic, social environment) | 370.057    | 10  | .000   | .564                |
| Block 2 (health status)                   | 208.185    | 10  | .000   | .216                |
| Block 3 (public objects and spaces)       | 578.242    | 20  | .000   | .780                |

**Table 3. Results of hierarchical binary logistic regression**

OR – odds ratio; CI – confidence interval

**FIGURES**

**Figure 1. Influence of contributing factors on perceived quality of life**
Figure 2. Impact of health status on perceived quality of life with and without other variables controlled