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Chronic diseases and self-assessment of health as predictors of unmet health needs of the elderly population in the Republic of Serbia: national health survey

Hronične bolesti i samoprocena zdravlja kao pokazatelji neostvarenih zdravstvenih potreba populacije starijih ljudi u Republici Srbiji: nacionalno istraživanje zdravlja

Nikola Savić*, Saša Sovilj†, Gordana Grbić‡, Aleksandra Arnaut*, Verica Jovanović§, Sanja Kocić*‖

***University of Kragujevac, Faculty of Medical Sciences, Kragujevac, Serbia; †Military Medical Academy, Belgrade, Serbia; ‡Academy of Vocational Studies Belgrade, Department of High School of Health, Belgrade, Serbia; §Institute for Public Health of Serbia "Dr. Milan Jovanović Batut", Belgrade, Serbia; ‖Institute of Public Health Kragujevac, Kragujevac, Serbia**

Abstract

Introduction/Aim. Unmet health needs are the difference between the health services considered necessary to solve a particular health problem and the health services that were actually received. Unmet health needs in the elderly population with chronic diseases can lead to deterioration of the health condition and complications. The aim of the study was to analyze the connection between the presence of chronic diseases and self-assessment of health with the unmet health needs of the elderly population. **Methods.** The study was part of the latest National Population Health Survey of the Republic of Serbia, conducted as a cross-sectional study on a representative stratified two-stage sample. Data from 3,450 respondents aged 65 and above were used for the purposes of the research. The research was conducted according to the European population health research methodology. Univariate and multivariate logistic regression were used to assess predictors of unmet health needs. **Results.** Every third respondent with a chronic disease did not receive the necessary form of health care (36.3%). Dominant predictors of unmet health needs were self-assessment of health [odds ratio (OR) = 0.63; 95% confidence interval (CI) = 0.58–0.68] along with chronic diseases (OR = 2.29; 95% CI = 1.87–2.81) and depression (OR = 2.12; 95% CI = 1.71–2.64). Respondents with a chronic health disorder were 2.2 times more likely to fail in the realization of the necessary health service compared to respondents who did not have long-term illnesses. Respondents who assess their own health as poor/very poor report unfulfilled health needs two times more often than respondents in good health. **Conclusion.** Unmet health needs in the elderly population are associated with self-reported health and the presence of chronic diseases. The results of such research can be the basis for a better organization of health care and the creation of health policies in order to improve the health of this population group.

Key words:
aged; chronic disease; health inequities; health status; self-assessment; surveys and questionnaires.

Apstrakt

Uvod/Cilj. Pod neostvarenim zdravstvenim potrebama podrazumeva se razlika između zdravstvenih usluga koje se smatraju potrebnim za rešavanje određenog zdravstvenog problema i realno ostvarenih zdravstvenih usluga. Neostvarene zdravstvene potrebe u populaciji starijih ljudi sa hroničnim bolestima mogu dovesti do pogoršanja zdravstvenog stanja i komplikacija. Cilj rada bio je da se analizira veza između prisustva hroničnih bolesti i samoprocene zdravlja i neostvarenih zdravstvenih potreba populacije starih ljudi. **Metode.** Studija je bila deo najnovijeg Nacionalnog istraživanja zdravlja stanovništva Republike Srbije, sprovedenog kao studija preseka na reprezentativnom stratifikovanom dvoetapnom uzorku. Za potrebe rada korišćeni su podaci 3 450 ispitanika starosti 65 i više godina. Istraživanje je sprovedeno prema Evropskoj metodologiji istraživanja zdravlja stanovništva. Za procenu pokazatelja neostvarenih zdravstvenih potreba korišćene su univarijantna i multivarijantna logistička

Correspondence to: Nikola Savić, University of Kragujevac, Faculty of Medical Sciences, Svetozara Markovića 69, 34 000 Kragujevac, Serbia. E-mail: nikolasavicvzs@gmail.com

regresija. **Rezultati.** Svaki treći ispitanik koji je imao hroničnu bolest nije ostvario neophodan oblik zdravstvene zaštite (36,3%). Dominantni pokazatelji neostvarenih zdravstvenih potreba bili su samoprocena zdravlja [*odds ratio* (OR) = 0,63; 95% *confidence interval* (CI) = 0,58–0,68] uz hronične bolesti (OR = 2,29; 95% CI = 1,87–2,81) i depresiju (OR = 2,12; 95% CI = 1,71–2,64). Ispitanici sa hroničnim poremećajem zdravlja su 2,2 puta češće bili neuspešni u realizaciji potrebne zdravstvene usluge u poređenju sa ispitanicima koji nisu imali dugotrajne bolesti. Ispitanici koji su sopstveno zdravlje procenili kao loše/vrlo loše, dva puta češće su prijavljivali neostvarene zdravstvene potrebe u poređenju sa ispitanicima dobrog zdravlja. **Zaključak.** Neostvarene zdravstvene potrebe starijih ljudi povezane su sa samoprocenom zdravlja i prisustvom hroničnih bolesti. Rezultati istraživanja mogu biti osnova za bolju organizaciju zdravstvene zaštite i za kreiranje zdravstvene politike čiji cilj će biti unapređenje zdravlja ove populacione grupe.

Ključne reči:
stare osobe; hronična bolest; zdravstvena zaštita, nejednakost; zdravstveno stanje; samoprocena; ankete i upitnici.

Introduction

The unmet health needs of the elderly are a major public health problem. This problem indicates systematic deficiencies in the provision of health care for this population. Unmet health needs can lead to a decline in health potential and the development of various diseases [1]. It is also important to understand the social aspects of this problem. The unmet health needs of older people can cause feelings of isolation and loneliness, which can have a negative impact on mental health. This can lead to depression, anxiety, and other mental problems, which further complicate the general condition of the person and require additional support and interventions [2, 3]. Addressing the unmet health needs of older adults includes improving access to health care, educating and empowering older adults, and promoting social support networks. This is critical to ensure that seniors receive the timely and adequate health care they need [4]. Chronic diseases in the elderly have a significant impact on unfulfilled health needs because they often require regular medical treatment, therapies, and controls. Lack of access to appropriate health care can result in a lack of adequate management of these conditions, leading to worsening health conditions and an increased frequency of complications. The presence of chronic diseases and personal perception of health have a great influence on the emergence of unfulfilled health needs of the elderly population [5]. Unfavorable social and financial conditions can result in older people giving up the necessary treatment or therapy, which further worsens their health condition and increases the risk of complications of existing chronic diseases. It is very important to ensure affordable and timely health care for elderly people with chronic diseases in order to reduce unmet health needs and improve quality of life [6]. Chronic diseases can lead to a decrease in mobility and independence, which makes it difficult for older people to access healthcare facilities or independently perform daily activities related to their health, which is in direct correlation with unmet health needs. Unfulfilled health needs in the old population with chronic diseases can affect the emergence of serious complications that can end in death. It is important to understand the complexity of interactions between chronic diseases and unmet health needs in the elderly in order to develop targeted interventions and health policies that will improve their health potential and quality of life [7, 8]. Self-assessment of the health of elderly residents significantly affects their quality of life and healthcare needs. The self-assessment of health is influenced by numerous factors, including the present symptoms of the disease, but also the general satisfaction with life. Economic independence and the availability of health care have a positive effect on the personal perception of health [9].

The aim of the study was to indicate the influence of chronic diseases and self-reported health status as predictors of unmet health needs of the elderly population.

Methods

Type of study

The survey is part of the fourth National health survey of the population of the Republic of Serbia (RS) from 2019. The research was conducted in the form of a cross-sectional population study on a representative sample of residents of the RS. The national population health survey was conducted by the Republic Institute of Statistics, the Institute for Public Health of Serbia "Dr. Milan Jovanović Batut", and the Ministry of Health of the RS.

The target population involved in the research

This research study analyzed the population of the elderly population of the RS, who were 65 years old or above. The sample consisted of a total of 3,540 respondents. It is important to emphasize that this study did not include persons living in the territory of Kosovo and Metohija, persons who were placed in collective households and specialized institutions, including persons serving prison sentences, penal institutions, psychiatric institutions, institutions for care and accommodation of the elderly, as well as monasteries.

Characteristics of the observed sample of respondents and data collection

The sample of residents of the RS was a stratified two-stage sample, and it was chosen to adequately reflect the health characteristics of the population at the level of four geographic regions: Belgrade, Vojvodina, Šumadija, and West, South, and East Serbia. These regions represent the

main strata in the sample. The sample was divided according to the respondent's place of residence and further divided into rural and urban areas, in order to show the different characteristics and needs of the elderly population throughout the RS. This approach makes it possible to obtain representative data that can be useful for understanding the health needs of the elderly population. The sample size was calculated according to the requirements and in accordance with the recommendations of the statistical office of the European Union (Eurostat) for the implementation of the National Population Survey of Serbia. The framework for the selection of the sample was based on the official Census of the RS from 2011. The interviewers were given adequate training during which they received detailed instructions for their work. There were 70 teams in total, with each team covering a corresponding field. Each team consisted of two members – one health worker and one interviewer with experience in conducting surveys. Sixteen field supervisors were responsible for the supervision and control of fieldwork. On average, each supervisor was hired to supervise the work of four teams. The Republic Institute of Statistics carried out the survey implementation control by direct contact with households by phone, while 10% were contacted through field control by visiting households. The methodology of the National Population Health Survey was fully respected. The population health survey was conducted over a period of three months in 2019. Data collection was carried out in October, November, and December according to the methodology and recommendations of the European Population Health Survey. In the course of data collection, the rules of scientific research work and ethical codes were respected, with respect for data privacy.

Research instrument

According to the guidelines for the implementation of the National Population Health Survey, the standardized instrument of the European Health Interview Survey (EHIS) was used. The instrument provides numerous data on the health characteristics of the population. Our focus was on unmet health needs and related predictors, such as chronic diseases.

Ethical and legal aspects

The ethical and legal aspects of the research were carefully managed to ensure compliance with legal and ethical norms. In the National Health Research, the International Declaration of Helsinki was respected as a standard of ethical principles without deviating from the principles of scientific research work. Each research participant was informed about the purpose of the study and the scope of their legal rights. All participants were informed through a written document. The respondents voluntarily agreed to participate in the research. This was documented by signing the informed consent. The anonymity of the participants during the research was ensured by not using data that could identify the individual in accordance with the law. This approach guarantees compliance with ethical standards and rules, thus ensuring the impossibility of data misuse. The research results were published in aggregate form, which fully guarantees the confidentiality of individual data. The authors of this study were given consent to use data for scientific purposes and publication of data in scientific journals by the Ethics Committee of the Institute for Public Health of Serbia "Dr. Milan Jovanović Batut" (Resolution number: 5179/1) [10, 11].

Statistical methods

The statistical software package SPSS 23.0 (Statistical Package for Social Sciences) on the Windows platform was used for data processing. Descriptive and inferential statistical methods were used in data analysis. Given that the data were of a categorical type, structural indicators expressed in percentages were used to describe the data. Applications of the inferential statistics method included the Chi-square (χ^2) test and logistic regression. In the analysis of the distribution of one characteristic, the χ^2 test in the form of the agreement test was used. Testing the difference in the distribution of two or more observational characteristics was performed with the χ^2 test. The relationship between the dependent variable and a series of independent variables was tested by bivariate and multivariate logistic regression. First, all variables were tested in the univariate model, and afterward, only statistically significant variables ($p \leq 0.05$) in the univariate regression were included in the multivariate model. The risk was estimated using the size of the odds ratio (OR) with a confidence interval (CI) of 95%.

Results

A total of 3,540 respondents participated in the research: 1,528 (43.2%) men and 2,012 (56.8%) women (χ^2 = 66.17, df = 1, $r < 0.01$). All respondents belong to the elderly population group, aged 65 and above. The average age of the subjects was 73.9 ± 6.3 years. The largest number (29.9%) of respondents were 65–69 years old, and the smallest (19.5%) were 80 years old and above. Slightly more than half of the respondents lived in a marital union. Respondents lived more often in urban areas (53.8%) (χ^2 = 19.99, df = 1, $r < 0.01$), most often in the region of Šumadija and Western Serbia (28.6%), and the least (20.4%) in Belgrade (χ^2 = 49.19, df = 3, $r < 0.01$). Among respondents with a long-term illness, one-third (36.3%) did not receive the necessary form of health care in the previous year, while among the healthy ones (without a long-term illness), 16.5% did not receive the necessary health care (χ^2 = 355.53, df = 2, $r < 0.01$). Among the hypertensive respondents, 34.9% lacked the required form of health care, and among the normotensive ones, 24.9% did not get adequate health care (χ^2 = 203.41, df = 2, $r < 0.01$). Patients suffering from coronary disease did not receive the expected health services in 39.5% of cases, compared to 28.1% of respondents who did not suffer from coronary disease (χ^2 = 99.03, df = 2, $r < 0.01$). Among respondents with diabetes mellitus, 36.3% reported the absence of necessary health services, and among subjects who did not

have diabetes mellitus, 30.5% had the same issue ($\chi^2 = 49.57$, df = 2, $r < 0.01$) (Table 1).

Respondents rate their satisfaction with their own state of health differently ($\chi^2 = 1455.78$, df = 4, $r < 0.01$). The largest number of respondents (37.7%) consider their health average. Every third respondent rates their health as poor, and every tenth as very poor. At the same time, 19.4% of respondents consider their health good or very good (2.9%). A clear difference can be observed in the respondent's self-assessment of the state of health in relation to the presence of chronic health disorders ($\chi^2 = 730.89$, df = 4, $r < 0.01$). Among respondents who rate their health as very good, three-fourths do not have any chronic disease. Respondents who rate their health condition as bad have a chronic disease in 94.8% of cases. The self-assessment of health as poor was associated with an increase in lack of a necessary form of health care ($\chi^2 = 394.9$, df = 8, $r < 0.01$). The percentage of respondents who rated their health as very good and who did not receive the necessary form of health care was 7.8%, while 17.8% of respondents who considered their health as good did not get adequate health care (Figure 1).

The necessary form of health care was not provided to 46.1% of respondents with urinary incontinence and 29.4% without this health problem ($\chi^2 = 56.95$, df = 2, $r < 0.01$). Similarly, 42.9% of respondents with a kidney problem and 30% without this problem did not receive the necessary health care ($\chi^2 = 39.89$, df = 2, $r < 0.01$). Half of the subjects with depression (49.1%) and 29.4% without it did not receive the necessary health care in the previous year ($\chi^2 = 77.63$, df = 2, $r < 0.01$). The stated ratio is very similar in patients with and without chronic bronchitis ($\chi^2 = 29.57$, df = 2, $r < 0.01$), myocardial infarction ($\chi^2 = 32.69$, df = 2, $r < 0.01$), asthma ($\chi^2 = 16.3$, df = 2, $r < 0.01$), stroke ($\chi^2 = 21.82$, df = 2, $r < 0.01$), and malignant disease ($\chi^2 = 12, 58$, df = 2, $r < 0.05$) (Table 2).

Univariate regression analysis identified self-assessment of health as a predictor of the impact on unmet health needs as well as the presence of a chronic disease. Important predictors of unmet health needs are almost all chronic health disorders, such as hypertension (OR = 1.37; 95% CI = 1.17–1.61), coronary disease (OR = 1.49; 95% CI = 1.28–1.74), hyperlipidemia (OR = 1.53; 95% CI = 1.29–1.81), arthrosis (OR = 1.79; 95% CI = 1.53–2.11), and other observed chronic health disorders. Statistically significant predictors were identified by multivariate regression analysis: self-assessment of health, existence of a long-term illness, elevated blood fat (cholesterol), osteoarthritis, chronic back problems, urinary incontinence, and presence of depression. Respondents who rate their health as poor/very poor report unmet health needs 50% more often compared to respondents who are in good/very good health. Respondents who have a chronic health disorder are 1.5 times more likely not to receive the necessary health services compared to respondents who do not have long-term illnesses (Table 3).

Table 1

Unmet health needs in relation to the presence of the most common chronic health disorders in the previous 12 months

Chronic health disorders	Unmet health needs		No health care required	*p*-value
	yes	no		
Long-term illness				
yes	972 (36.3)	1,513 (56.5)	194 (7.2)	< 0.01
no	140 (16.5)	449 (52.9)	260 (30.6)	
Hypertension				
yes	804 (34.9)	1,337 (58.0)	163 (7.1)	< 0.01
no	298 (24.9)	616 (51.4)	285 (23.8)	
Coronary heart disease or angina pectoris				
yes	400 (39.5)	561 (55.4)	51 (5.0)	< 0.01
no	701 (28.1)	1,392 (55.7)	404 (16.2)	
Diabetes mellitus				
yes	232 (36.3)	378 (59.2)	29 (4.5)	< 0.01
no	877 (30.5)	1,580 (54.8)	424 (14.7)	
Hyperlipidemia				
yes	408 (54.3)	300 (39.9)	43 (5.7)	< 0.01
no	1,504 (56.4)	765 (28.7)	400 (14.9)	
Arthrosis, excluding arthritis				
yes	362 (42.9)	423 (50.1)	59 (7.0)	< 0.01
no	747 (27.9)	1,536 (57.3)	397 (14.8)	
Neck deformity/chronic cervical spine problem				
yes	323 (41.4)	407 (52.1)	51 (6.5)	< 0.01
no	787 (28.7)	1,551 (56.6)	404 (14.7)	
Lower spine deformity/chronic back problem				
yes	502 (40.5)	643 (51.9)	95 (7.7)	< 0.01
no	610 (26.7)	1,314 (57.5)	360 (15.8)	

Results are shown as numbers (percentages). Chi-square test.

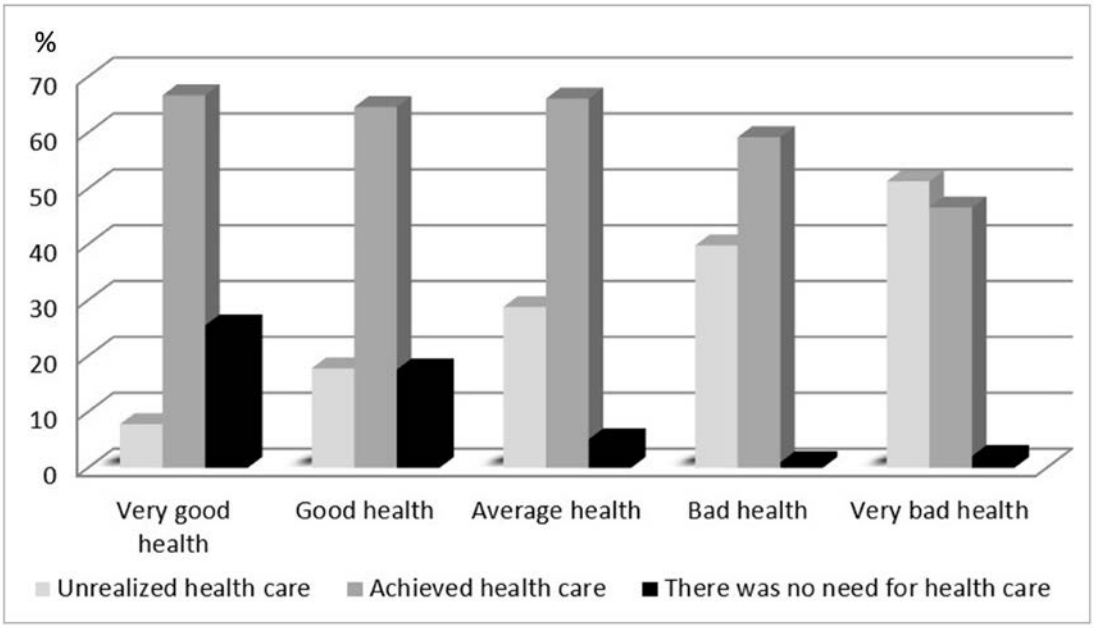

Fig. 1 – Unrealized health care and self-assessment of health in the elderly population.

Table 2

Unmet health needs in relation to the presence of chronic health disorder in the previous 12 months

Chronic health disorder	Unmet health needs		No health care was required	*p*-value
	yes	no		
Urinary incontinence				
yes	206 (46.1)	212 (47.4)	29 (6.5)	< 0.01
no	906 (29.4)	1,748 (56.7)	427 (13.9)	
Kidney problems				
yes	173 (42.9)	208 (51.6)	22 (5.5)	< 0.01
no	935 (30.0)	1,749 (56.1)	433 (13.9)	
Depression				
yes	186 (49.1)	181 (47.8)	12 (3.2)	< 0.01
no	923 (29.4)	1,776 (56.5)	443 (14.1)	
Allergy, excluding allergic asthma				
yes	137 (41.6)	166 (50.5)	26 (7.9)	< 0.01
no	973 (30.5)	1,791 (56.1)	429 (13.4)	
Chronic bronchitis, chronic obstructive pulmonary disease, pulmonary emphysema				
yes	124 (41.9)	159 (53.7)	13 (4.4)	< 0.01
no	986 (30.5)	1,802 (55.8)	443 (13.7)	
Myocardial infarction and chronic consequences of infarction				
yes	108 (42.5)	139 (54.7)	7 (2.8)	< 0.01
no	1,002 (30.6)	1,826 (55.7)	450 (13.7)	
Asthma (including allergic asthma)				
yes	102 (42.3)	120 (49.8)	19 (7.9)	< 0.01
no	1,008 (30.7)	1,839 (56.0)	437 (13.3)	
Stroke				
yes	87 (45.1)	95 (49.2)	11 (5.7)	< 0.01
no	1,024 (30.7)	1,869 (56.0)	446 (13.4)	
Malignant disease				
yes	44 (45.4)	49 (50.5)	4 (4.1)	< 0.05
no	1,066 (31.1)	1,914 (55.8)	452 (13.2)	
Liver cirrhosis				
yes	3 (21.4)	11 (78.6)	/	> 0.05
no	1,107 (31.5)	1,952 (55.6)	454 (12.9)	

Results are shown as numbers (percentages). Chi-square test.

Table 3

Chronic health disorders and self-assessment of health in the previous 12 months as predictors of unmet health needs

Parameters	Univariate model		Multivariate model	
	OR (95% CI)	*p*-value	OR (95% CI)	*p*-value
Self-assessment of health	good/very good (referential)			
	0.63 (0.58–0.68)			
bad/very bad	1.74 (1.48–2.04)	< 0.01	2.00 (1.54–2.59)	< 0.01
average	2.99 (2.40–3.72)		1.53 (1.20–1.96)	< 0.05
Chronic disease	2.29 (1.87–2.81)	< 0.01	1.47 (1.16–1.86)	< 0.05
hypertension	1.37 (1.17–1.61)	< 0.01	> 0.05	
coronary heart disease	1.49 (1.28–1.74)	< 0.01	> 0.05	
diabetes mellitus	1.19 (0.99–1.42)	> 0.05	> 0.05	
hyperlipidemia	1.53 (1.29–1.81)	< 0.01	1.22 (1.01–1.47)	< 0.05
arthrosis	1.79 (1.53–2.11)	< 0.01	1.24 (1.03–1.50)	< 0.05
spinal problems	1.64 (1.39–1.93)	< 0.01	> 0.05	
back problem	1.77 (1.52–2.05)	< 0.01	1.30 (1.07–1.58)	< 0.05
urinary incontinence	1.86 (1.52–2.27)	< 0.01	1.31 (1.05–1.65)	< 0.05
kidney problems	1.62 (1.31–2.01)	< 0.01	> 0.05	
depression	2.12 (1.70–2.64)	< 0.01	1.46 (1.14 –1.86)	< 0.05
allergy	1.55 (1.23–1.97)	< 0.01	> 0.05	
chronic bronchitis	1.52 (1.19–1.94)	< 0.05	> 0.05	
myocardial infarction	1.52 (1.17–1.97)	< 0.05	> 0.05	
asthma	1.57 (1.20–2.06)	< 0.05	> 0.05	
stroke	1.70 (1.27–2.28)	< 0.01	> 0.05	
malignant disease	1.66 (1.11–2.49)	< 0.05	> 0.05	
liver cirrhosis	0.54 (0.15–1.92)	> 0.05	> 0.05	

OR – odds ratio; CI – confidence interval.

Discussion

Elderly people often suffer from chronic diseases. This population often has one or more associated chronic diseases that affect overall health potential and quality of life. Chronic diseases can lead to numerous complications in the elderly, which can affect health care needs [12]. The unmet health needs of the elderly population increase the risk of complications of chronic health disorders and mortality [13]. Research on unmet needs for health care is limited, and it is very important to analyze how chronic diseases affect as a predictor of their occurrence [14]. In our research, 39.5% of patients suffering from coronary disease did not realize all their needs for health care. This data agrees with the research of other authors. Inequalities in health care are a significant problem for these patients [15]. Lack of implementation of necessary health care is also an important predictor in other chronically ill elderly patients. Patients with diabetes mellitus, arthrosis, and spine problems are also at risk for complications due to inadequate health care and untimely medical treatment. This problem has been identified by other researchers, which is very important for the improvement of the health and social system [16, 17]. A large number of elderly patients with urinary incontinence and kidney problems have not received the necessary health care. This can have a very negative effect on the control of these chronic health disorders. Older chronic patients with these problems require continuous medical controls and affordable health care in order to preserve and improve their level of health potential [18]. Half of the respondents in our study who suffer from depression did not receive all the necessary health care in the previous year. This is very serious information that shows the availability of health care for people with mental illnesses. This data matches the results obtained in Belgium, where it is also stated that various factors have influenced the emergence of unmet health needs in people with mental problems [19]. Unmet health needs are very common in other chronic patients as well, for instance, in people who suffer from allergies, chronic bronchitis, consequences of myocardial infarction or stroke [20, 21]. Unmet health needs are an important predictor that affects patients with malignant diseases. Elderly people with malignant diseases require intensive medical treatment and health care. The lack of adequate health care in these chronic patients can irreversibly impair health and lead to complications [22]. The unmet health needs of the elderly population are often related to the self-assessment of health as bad. Our study concluded that self-reported health status is an important predictor that correlates with the unmet health needs of chronically ill patients. Numerous studies also confirm that people who rate their health as bad or very bad have a higher percentage of unfulfilled health needs. Elderly people often have numerous health problems that affect their health, independence, and quality of life. Self-reported health is an important predictor that must not be neglected in the assessment of population health [23–25].

Limitations

Our study is based on data from the National Health Survey from 2019, and this method of data analysis has its limitations. Since the study is cross-sectional, it can identify associations between the presence of chronic diseases and self-reported health with aspects of unmet health needs of the elderly population but cannot track variables over a longer period of time. Data based on self-assessment of one's own health

leaves the possibility for a subjective view of health. Although this research study is based on a national survey, certain population groups or those who are institutionalized, staying in institutions for the care of the elderly, were not represented in the observed sample. Since the data was collected in 2019, certain aspects observed in the survey may have changed, especially given the impact of the COVID-19 pandemic on the health of the elderly population. Understanding the presented limitations is very important for the analysis of future population health research, as well as the planning of future scientific studies, which could lead to a better understanding of the unmet health needs of the elderly population in our country.

Conclusion

Unmet health needs are associated with the presence of chronic diseases in the elderly population. Our data can help in the organization of the health system and the creation of new health policies. The most dominant predictors are the presence of a chronic disease and self-assessment of health. In addition, one of the prominent predictors is the presence of depression. Unmet health needs of the elderly population with chronic diseases should be considered in the course of healthcare planning and the organization of health systems. A poor level of health potential in the self-assessment of the health of the elderly population is associated with the presence of chronic diseases and unmet needs for health care. It is necessary to overcome barriers and health inequalities in the availability of health care in this population group.

Conflict of interest

The authors declare no conflict of interest.

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